AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE	PAGE OF PAGES	
	1	5

2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO.(If applicable)
0001	16-Jun-2004	W16ROE-4100-7736	

6. ISSUED BY CODE W912DS

USA ENGINEER DISTRICT, NEW YORK
ATTN:CENAN-CT ROOM 1843
26 FEDERAL PLAZA
NEW YORK NY 10278

7. ADMINISTERED BY (If other than item 6) CODE

See Item 6

8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code)

CODE FACILITY CODE

X	9A. AMENDMENT OF SOLICITATION NO. W912DS-04-R-0006
X	9B. DATED (SEE ITEM 11) 09-Jun-2004
	10A. MOD. OF CONTRACT/ORDER NO.
	10B. DATED (SEE ITEM 13)

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

[X] The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offer [X] is extended, [ ] is not extended.

Offer must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended by one of the following methods: (a) By completing Items 8 and 15, and returning_____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

[ ] A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.

[ ] B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(B).

[ ] C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:

[ ] D. OTHER (Specify type of modification and authority)

E. IMPORTANT: Contractor [ ] is not, [ ] is required to sign this document and return _____ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

The purpose of this amendment is to do the following changes to W912DS-04-R-0006, Explosive Research and Development Loading Facility : Updated guidance memorandum in attachment E, delete content of attachment F,delete contents of attachment K, revised title of attachment L, add attachment N (room layout - proposed facilities), and delete contents of attachment U. Sections 00120 and 00800 has been replaced in their entirety.

See continuation Page of the SF 30.

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER (Type or print)		16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) TEL: EMAIL:	
15B. CONTRACTOR/OFFEROR (Signature of person authorized to sign)	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA BY (Signature of Contracting Officer)	16C. DATE SIGNED 16-Jun-2004

SECTION SF 30 BLOCK 14 CONTINUATION PAGE

SUMMARY OF CHANGES

SECTION SF 30 - BLOCK 14 CONTINUATION PAGE

The following have been added by full text:

CONTINUATION PAGE

Pre-Proposal Conference is on 1 July 2004 at 10:00 AM EST. Reference Section 0010 (Security Information) and Section 00800 paragraph 1.48 for instruction on how to obtain security and camera passes to the site visit. The New Proposal Due date is 23 July 2004 at 2:00:00 PM EST.

NOTE: Bidders must acknowledge receipt of this amendment by the date specified in the solicitation by one of the following methods: in the space provided on the SF 1442, by separate letter, or by telegram, or by signing block 15 below. FAILURE TO ACKNOWLEDGE AMENDMENTS BY THE DATE AND TIME SPECIFIED MAY RESULT IN REJECTION OF YOUR BID IN ACCORDANCE WITH THE LATE BID, LATE MODIFICATIONS OF BIDS OR LATE WITHDRAWAL OF BIDS CLAUSE (FAR 14.304).

SECTION 00010 - SOLICITATION CONTRACT FORM

The required response date/time has changed from 13-Jul-2004 02:00 PM to 23-Jul-2004 02:00 PM.

CLIN 0010

The CLIN extended description has changed from This line applies to all punch list items including those items identified at the prefinal and final inspections and is above the normal retainage for this item. Offerors shall include this amount in the bid price (50,000.00). This amount shall not be changed.
This amount shall be retained by the Government in the event contractor fails to complete punch list items. This amount is separate from liquidated damages to be applied in the event the contractor fails to complete the work within the time specified in the contract including any extensions. See Section 00800 for additional information. to
TO: This line applies to all punch list items including those items identified at the prefinal and final inspections and is above the normal retainage for this item. Offerors shall include this amount in the bid price" $50,000.00". This amount shall not be changed. This amount shall be retained by the Government in the event contractor fails to complete punch list items. This amount is separate from liquidated damages to be applied in the event the contractor fails to complete the work within the time specified in the contract including any extensions. See Section 00800 for additional information. (No partial payments will be provided until final acceptance of this item)..

CLIN 0011

The CLIN extended description has changed from Drawings Per The 00800 Section
For Design Build a modern, approximately 28,000 square feet functionally configured explosive research and development facility, Picatinny, New Jersey (No partial payments will be provided until final acceptance of this item). (15,000.00) to Drawings Per The 00800 Section TO: For Design Build a modern, approximately 28,000 square feet functionally configured explosive research and development facility, Picatinny, New Jersey (No partial payments will be provided until final acceptance of this item). "$15,000.00"..

CLIN 0012 is added as follows:

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0012		1	Dollars, U.S.		

50% As Built
FFP
Drawings Per The 00800 Section For
Design Build a modern, approximately 28,000 square feet functionally configured explosive research and development facility, Picatinny, New Jersey (No partial payments will be provided until final acceptance of this item). $7,500.00.
Reference Paragraph 1.10 e. (00800 Section)

NET AMT

FOB: Destination

INSPECTION AND ACCEPTANCE

The following Acceptance/Inspection Schedule was added for CLIN 0012:

INSPECT AT	INSPECT BY	ACCEPT AT	ACCEPT BY
N/A	N/A	N/A	Government

The following have been modified:

TOTAL:

TOTAL BASE BID FOR LINE ITEMS 0001 – 0006

$_____

TOTAL OPTIONS FOR LINE ITEMS 0007 - 0009

$_____

TOTAL PUNCH LIST, AS-BUILT DRAWINGS & 50% AS-BUILT (LINE ITEMS 0010 – 0012) $72,500.00 (THIS DOLLAR AMOUNT CANNOT BE CHANGED)

TOTAL BID (LINE ITEMS 0001 – 00012)

$_____

The following have been modified:

52.236-27 SITE VISIT (CONSTRUCTION) (FEB 1995)

(a) The clauses at 52.236-2, Differing Site Conditions, and 52.236-3, Site Investigations and Conditions Affecting the Work, will be included in any contract awarded as a result of this solicitation. Accordingly, offerors or quoters are urged and expected to inspect the site where the work will be performed.

(b. A pre-proposal conference in conjunction with the RFP solicitation will be held on 1 July 2004 in Building 3002 [DPW Bldg], large conference room, Picatinny ARDEC, Picatinny, New Jersey, commencing at 10:00 am.

c. A site visit will be conducted as part of the pre-proposal conference. The proposed pre-proposal conference agenda includes:
10:00 - 11:30 am Introductions and administrative topic
11:30 am - 12:45 pm Site visit [Shuttle bus from will depart from Bldg 3002 parking lot to project site. Participants are required to ride the bus to and from the site visit]
1:00pm Shuttle bus returns from site to Bldg 3002 parking lot and concludes pre-proposal conference

d. Prospective offerors are advised that technical questions concerning the project and/or the RFP documents will neither be accepted nor responded to during the pre-proposal conference. Questions of a general nature will be responded to during the administrative topics portion of the conference upon; written receipt from offeror on forms supplied and concurrence of the Corps' Contracting Division and Office of Counsel staff present. All questions must be submitted in writing and emailed to the Contract Specialist and in accord with section h of this section. A solicitation amendment will be issued providing responses to questions received by the cut off date identified below.

e. Prospective offerors shall submit completed visitor registration and camera pass request forms, electronically and forwarded by email only (fax copies will not be accepted and/or processed), at least five (5) business days prior to the date of the Pre-Proposal Conference to Heather Durr and Timothy Moran at Heather.Durr@usace.army.mil **and** Robert.T.Moran@usace.army.mil. Visitor registration form and camera pass request form are provided within the RFP after the FORM 1442. Offerors may contact either individual confirming receipt at 973-989-0802. Offerors are reminded that fax copies of the visitor registration and/or camera pass request forms will not be accepted.

f. Prospective offerors are advised to allow at least two (2) hours prior to the Pre-Proposal Conference for processing in at Main Gate Visitor Control Center, securing camera pass from Security Headquarters (if pass requested), and arrival at building 3002 conference room. The pre-proposal conference will begin promptly at 10:00 am and request everyone is seated by that time.

g. Visitors and/or vehicles will not be permitted access to Picatinny ARDEC without prior registration and the following: Employment Eligibility Form, INS Form I-9 (if not a US citizen). Driver's license or other type of approved photo identification. Current vehicle registration, insurance, and DMV inspection sticker. Cameras shall not be permitted without obtaining pre-approved camera passes for the camera and individuals to take photographs. The following information shall be submitted at the time the Contractor registers for the Pre-Proposal Conference: Name, Title, and company of the individual(s) being authorized to take photographs, and the make, model, serial number of the camera to be utilized.

h. There will be only one (1) site visit for all prospective offerors, which will take place immediately following the Pre-Proposal Site meeting at Picatinny ARDEC on 1 July 2004.

i. The Contractor is responsible to determine existing conditions of buildings to be renovated. All questions from bidders shall be submitted in written form and sent by email to Loretta Parris **and** Scott Helmer at

Loretta.e.parris@usace.army.mil and Scott.M.Helmer@usace.army.mil. Fax copies of questions and/or hand written documents will not be accepted. Cutoff date for receipt of questions is 8 July 2004, 5:00:00 pm EST. Responses to bidders questions, received in the required format, will be issued by solicitation amendment on or about 14 Jul 2004.
-- End of Section --

(End of provision)

(End of Summary of Changes)

DEPARTMENT OF THE ARMY
NEW YORK DISTRICT, CORPS OF ENGINEERS
JACOB K. JAVITS FEDERAL BUILDING
NEW YORK, N.Y. 10278-0090

REPLY TO
ATTENTION OF

Contracts Branch
Contracting Division

SUBJECT: Central Contractor Registration

TO ALL PROSPECTIVE CONTRACTORS:

Please be advised that it is now required to register with the CCR (Central Contractor Registration) in order to perform work for the Federal Government. For additional information, please refer to the instruction sheet on the back of this letter, which includes the appropriate websites and telephone numbers.

Sincerely,

Ella D. Snell
Contracting Officer

CENTRAL CONTRACTOR REGISTRATION

HTTP://WWW.ACQ.OSD.MIL/EC

1(800) 334-3414

The Central Contractor Registry (CCR) is the Government's new national storing house of commercial and financial information on current and would-be contractors.

CCR eliminates the requirement for current and future contractors to submit Standard Form 129 and provides a single location for registering to conduct business with the Federal Government. Access to the register is available via the World Wide Web. A registration workbook is available for downloading from this site. It is highly recommended you review it prior to processing CCR to ensure all required information is available. Contractors are required to have a DUNS (Data Universal Numbering System) assigned by Dunn & Bradstreet at no charge (call 1-800-333-0505).

The initial Web Site application capability is for the initial contractor registration only. The ability to change, update or cancel a registration and query contractor information via the Web is currently in effect. After submitting a registration, contractors may use the Web application to inquire as to the status of their registration. Typically, a registration will be activated within 48 hours after receiving a complete and accurate application via the Internet. To register via the Internet, go to *http://ccr.edi.disa.mil*. Registration of an applicant through fax or mail may take up to 30 days. The mailing addresses are as follows: For firms with Legal business names beginning with the letters A-K or a number use CCR Registration Assistance Center, 2000 South Loop 256, Suite 11, Palestine, Texas 75801, FAX NO: (903) 729-7988. For firms with Legal business names beginning with the letters L-Z or a number use CCR Registration Assistance Center, 1450 Scalp Avenue, Johnstown, PA. 15904 FAX NO: (814) 262-2326. For those Contractor's who chose to register by mail, a paper registration form can be used and sent or faxed to the appropriate above address who will also furnish the form. Once successfully registered in CCR, a notice will be sent via email, fax, or regular post with information that a Trading Partner Identification Number (TPIN) will soon follow. For CCR implementation and contract questions please contact Robert Cooper at (703) 681-7573.

Anyone may access CCR via the Web to inquire whether vendor is registered at the following site: *http://ccr.edi.disa.mil.*

Information or assistance is available from your local Electronic Commerce Resources Center or Electronic Commerce Information Center at 1-800-334-3414 (8am-8pm), Monday-Friday, except Federal Holidays.

Additionally, your local Procurement Technical Assistance Center (PTAC) employs highly skilled professionals to help businesses like ours earn Federal and State Government contracts; assist with your CCR enrollment. The PTAC can provide Government specifications, daily listings of bid opportunities, bid history and contract award results, training and assistance with Electronic Data Exchange (EDI).

To find the office nearest you, the national PTAC directory can be accessed at Website *http://www.fedmarket.com/tecassis.html.*

US Army Corps of Engineers®

Request for Proposal - Design Build

Explosive Research & Development Loading Facility

Armament, Research, Development & Engineering Center (ARDEC)
Picatinny, New Jersey 07806

Solicitation No. W912DS-04-R-0006

Project No. 49472

US ARMY CORPS OF ENGINEERS NEW YORK DISTRICT, NY, NY 10278-0090
REQUEST FOR PROPOSAL FOR:

EXPLOSIVE RESEARCH & DEVELOPMENT LOADING FACILITY PICATINNY ARSENAL, NEW JERSEY

1. Attached is REQUEST FOR PROPOSAL (RFP) NO. **W912DS-04-R-0006**
2. OFFERS MUST BE SET FORTH full, accurate, and complete information as required by this Request for Proposal, including attachments. The penalty for making false statements in bids is prescribed under Title 18, United States Code, Section 1001.
3. SUBMISSION OF OFFERS: Complete details concerning proper submission of offers are contained in the INSTRUCTIONS, CONDITIONS, AND NOTICES TO OFFERORS (Section 00100).
4. Note the REQUIREMENT FOR AFFIRMATIVE ACTION of the EQUAL OPPORTUNITY clause as it applies to the contract resulting from this solicitation. (See paragraph NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY in Section 00100 of this IFB).
5. REPRESENTATIONS AND CERTIFICATIONS – SECTION 00600 Offerors are required to complete the REPRESENTATIONS AND CERTIFICATIONS and submit them with their bids.

   NONSEGREGATED FACILITIES. Failure of a bidder or offeror to agree to the certification will render his bid or offer non-responsive to the terms of solicitations involving awards of contracts exceeding $10,000 which are not exempt from the provisions of the Equal Opportunity Clause (1984 APR).

SUMMARY OF WORK

This project consists of design/build to replace existing buildings containing administrative offices, explosives machining and processing functions with new facilities of similar functions. The new facilities are to be located in the 200 area of the Armament, Research, Development & Engineering Center, at Picatinny, New Jersey. The design/build project also includes related support facilities, site improvements an exterior renovation of existing building #225, an explosives machining operation building. The renovation of building 225 includes minor demolition. At present there are existing building located on or near the proposed site for this new facility. The existing buildings are to be demolished and removed by others. The site will be available in a rough graded condition. The following is a general summary of the work. Details are indicated in the technical sections:

a. **Administration Office:** A detached office building, with connecting covered walkway (see Bid Options) leading to the explosives processing/machining bays. Office building shall including a separate entry, open office space for 10 work stations, toilet/shower facilities, conference room and break room. Contractor shall be responsible for the design/build of a new building.
b. **Explosive Processing Bays.** A series of explosives processing bays, connected by an enclosed equipment access corridor with separate remote control operation/monitoring rooms. The functional requirements of this portion of the facility may be structurally connected to the mechanical/utility spaces, loading dock and Explosives Machining Bays. Contractor shall be responsible for the design/build of a new building.
c. **Explosives Machining Bays.** A series of explosives machining bays connected by an enclosed equipment access corridor with remote control operation/monitoring rooms. The Contractor shall be responsible for the design/build of a new building.
d. **Mechanical/Utility Room.** A mechanical room to contain required utility equipment with separate adjacent spaces for washer/dryer/mop sink room, electrical, communications, and fire sprinkler equipment. Contractor shall be responsible for the design/build of a new building.
e. **Loading Dock.** A loading dock to receive and ship equipment used by and prepared by the facility. The loading dock shall be centrally located to provide more efficient distribution and handling of material. Dock area shall be covered. The Contractor shall be responsible for the design/build of this function.
f. **Explosives Storage Magazine.** A detached four-bay explosives storage magazine shall be provided. The magazine shall be connected to the main explosive machining and processing bays by a weather protected, covered access way. The Contractor shall be responsible for the design/build of a new building.
g. **Contaminated water control.** A system for the collection, containment and removal of contaminated “pink water” shall be

provided. This system shall collect and contain all contaminated process waste water and shall be located adjacent to a detached contaminated water removal dock. The Contractor shall be responsible for the design/build of this system.

h. **Site improvements.** Site development includes utilities, drainage, asphalt paving for parking lot, service road improvement, sidewalks and concrete dumpster pads. The Contractor shall be responsible for the design/build of these items.

MAIN TABLE OF CONTENTS

SECTION	TITLE
00010	SOLICITATION CONTRACT FORM/BIDDING SCHEDULE
00100	INSTRUCTIONS, CONDITIONS, AND NOTICE TO BIDDERS
00120	PROPOSAL EVALUATION AND CONTRACT AWARD
00600	REPRESENTATIONS AND CERTIFICATIONS
00700	CONTRACT CLAUSES
00800	SPECIAL CONTRACT REQUIREMENTS (INCLUDING PICATINNY SUPPLEMENT)
00900	WAGE RATES

TECHNICAL PROVISIONS

01010	DESIGN REQUIREMENTS (Parts 1-11)
01012	DESIGN AFTER AWARD
01090	SOURCES FOR REFERENCE PUBLICATIONS
01312	QUALITY CONTROL SYSTEM (QCS)
01320A	PROJECT SCHEDULE: NETWORK ANALYSIS SYSTEM
01330	SUBMITTAL PROCEDURES
01420	SAFETY
01451	CONTRACTOR QUALITY CONTROL
01452	TESTING FOR MECHANICAL AND ELECTRICAL SYSTEMS
01453	CONTRACTOR WARRANTY MANAGEMENT

ATTACHMENTS

Attachment Index

Attachment A	Room-by-room Requirements (Architectural, Mechanical, Electrical, Communications)
Attachment B	Picatinny Arsenal Installation Design Guide
Attachment C	Site Safety Plan, Picatinny ARDEC
Attachment D	Environmental Assessment dated July 2002
Attachment E	Substantial Dividing Walls (SDW)

Attachment F	Not Used
Attachment G	Not Used
Attachment H	Not Used
Attachment I	Not Used
Attachment J	Contaminated Waste Water (pink water) Profile
Attachment K	Not Used
Attachment L	Supplemental Test Pit Program
Attachment M	Standing Operating Procedure For Soil Management Procedures during Construction Activities Picatinny Arsenal, July 2003
Attachment N	Room Layout - Proposed Facilities
Attachment O	ACSIM Installation Design Guide
Attachment P	Graphic Room Layouts
Attachment Q	Civil Drawings
Attachment R	Communication Systems References
Attachment S	Picatinny Water Analysis Report dated 13 June 2003
Attachment T	Not Used
Attachment U	Not Used
Attachment V	Summarized Analytical Data from Nov 2003 Picatinny Phase II RI Report, Volume 2 - Area H Sites
Attachment W	Not Used
Attachment X	Forklift Data
Attachment Y	Construction Sign
Attachment Z	Not Used

SOLICITATION, OFFER, AND AWARD (Construction, Alteration, or Repair)	1. SOLICITATION NO. W912DS-04-R-0006	2. TYPE OF SOLICITATION [ ] SEALED BID (IFB) [X] NEGOTIATED (RFP)	3. DATE ISSUED 09-Jun-2004	PAGE OF PAGES 1 OF 77

IMPORTANT - The "offer" section on the reverse must be fully completed by offeror.

4. CONTRACT NO.	5. REQUISITION/PURCHASE REQUEST NO. W16ROE-4100-7736	6. PROJECT NO.

7. ISSUED BY CODE W912DS	8. ADDRESS OFFER TO (If Other Than Item 7) CODE
USA ENGINEER DISTRICT, NEW YORK ATTN:CENAN-CT ROOM 1843 26 FEDERAL PLAZA NEW YORK NY 10278 TEL:212-264-0238 FAX: 212-264-3013	**See Item 7** TEL: FAX:

9. FOR INFORMATION CALL:	A. NAME	B. TELEPHONE NO. (Include area code) (NO COLLECT CALLS)
	LORETTA E PARRIS	212-264-4863

SOLICITATION

NOTE: In sealed bid solicitations "offer" and "offeror" mean "bid" and "bidder".

10. THE GOVERNMENT REQUIRES PERFORMANCE OF THE WORK DESCRIBED IN THESE DOCUMENTS (Title, identifying no., date):

Design Build a modern, approximately 28,00 Square Feet functionally configured explosive Research and Development facility, Picatinny, New Jersey.

This Procurement is restricted for 8(a) Competitive
NAICS CODE 236210, Size Standard: $28.5 million
SIC CODE , 1531

Contract Specialist: Loretta Parris, (212)264-4863
Technical Coordinator: Perry Pang, (212)264-9095

NOTE NEW REQUIREMENT: BONDS, POWERS OF ATTORNEY, STATEMENTS OF AUTHENTICITY AND CONTINUING VALIDITY, AND ALL RELATED DOCUMENTS MUST NOT BEAR COMPUTER GENERATED SIGNATURES AND/OR SEALS. DOCUMENTS BEARING SIGNATURES AND/OR SEALS GENERATED AS PART OF A DOCUMENT, AS OPPOSED TO BEING AFFIXED TO THE DOCUMENT AFTER ITS GENERATION, WILL NOT BE ACCEPTED. SUBMISSION OF SUCH DOCUMENTS MAY RENDER THE BID OF OFFER NON-RESPONSIVE AND INELIGIBLE FOR AWARD. PLEASE REVIEW ALL BONDS AND ACCOMPANYING DOCUMENTS REQUIRED TO BE SUBMITTED.

11. The Contractor shall begin performance within 5 calendar days and complete it within 730 calendar days after receiving [ ] award, [X] notice to proceed. This performance period is [X] mandatory, [ ] negotiable. (See _____.)

12 A. THE CONTRACTOR MUST FURNISH ANY REQUIRED PERFORMANCE AND PAYMENT BONDS? (If "YES," indicate within how many calendar days after award in Item 12B.) [X] YES [ ] NO	12B. CALENDAR DAYS 10

13. ADDITIONAL SOLICITATION REQUIREMENTS:

A. Sealed offers in original and 5 copies to perform the work required are due at the place specified in Item 8 by 02:00 PM (hour) local time 13 Jul 2004 (date). If this is a sealed bid solicitation, offers must be publicly opened at that time. Sealed envelopes containing offers shall be marked to show the offeror's name and address, the solicitation number, and the date and time offers are due.

B. An offer guarantee [X] is, [ ] is not required.

C. All offers are subject to the (1) work requirements, and (2) other provisions and clauses incorporated in the solicitation in full text or by reference.

D. Offers providing less than 120 calendar days for Government acceptance after the date offers are due will not be considered and will be rejected.

SOLICITATION, OFFER, AND AWARD (Continued)

(Construction, Alteration, or Repair)

OFFER ***(Must be fully completed by offeror)***

14. NAME AND ADDRESS OF OFFEROR *(Include ZIP Code)*	15. TELEPHONE NO. *(Include area code)*
	16. REMITTANCE ADDRESS *(Include only if different than Item 14)* **See Item 14**
CODE / FACILITY CODE	

17. The offeror agrees to perform the work required at the prices specified below in strict accordance with the terms of this solicitation, if this offer is accepted by the Government in writing within _____ calendar days after the date offers are due. *(Insert any number equal to or greater than the minimum requirements stated in Item 13D. Failure to insert any number means the offeror accepts the minimum in Item 13D.)*

AMOUNTS	SEE SCHEDULE OF PRICES

18. The offeror agrees to furnish any required performance and payment bonds.

19. ACKNOWLEDGMENT OF AMENDMENTS

(The offeror acknowledges receipt of amendments to the solicitation -- give number and date of each)

AMENDMENT NO.										
DATE										

20A. NAME AND TITLE OF PERSON AUTHORIZED TO SIGN OFFER *(Type or print)*	20B. SIGNATURE	20C. OFFER DATE

AWARD ***(To be completed by Government)***

21. ITEMS ACCEPTED:

22. AMOUNT	23. ACCOUNTING AND APPROPRIATION DATA

24. SUBMIT INVOICES TO ADDRESS SHOWN IN *(4 copies unless otherwise specified)*	**ITEM**	25. OTHER THAN FULL AND OPEN COMPETITION PURSUANT TO ☐ 10 U.S.C. 2304(c) ☐ 41 U.S.C. 253(c)
26. ADMINISTERED BY CODE		27. PAYMENT WILL BE MADE BY: CODE

CONTRACTING OFFICER WILL COMPLETE ITEM 28 OR 29 AS APPLICABLE

☐ 28. NEGOTIATED AGREEMENT *(Contractor is required to sign this document and return _____ copies to issuing office.)* Contractor agrees to furnish and deliver all items or perform all work, requisitions identified on this form and any continuation sheets for the consideration stated in this contract. The rights and obligations of the parties to this contract shall be governed by (a) this contract award, (b) the solicitation, and (c) the clauses, representations, certifications, and specifications or incorporated by reference in or attached to this contract.

☐ 29. AWARD *(Contractor is not required to sign this document.)* Your offer on this solicitation, is hereby accepted as to the items listed. This award consummates the contract, which consists of (a) the Government solicitation and your offer, and (b) this contract award. No further contractual document is necessary.

30A. NAME AND TITLE OF CONTRACTOR OR PERSON AUTHORIZED TO SIGN *(Type or print)*		31A. NAME OF CONTRACTING OFFICER *(Type or print)* TEL: EMAIL:	
30B. SIGNATURE	30C. DATE	31B. UNITED STATES OF AMERICA BY	31C. AWARD DATE

Section 00010 - Solicitation Contract Form

SECURITY INFORMATION

SITE VISIT ACCESS INSTRUCTIONS FOR PICATINNY ARSENAL

There will be only site visit for all prospective offerors, which will take place immediately following the Pre-Proposal Site Conference at Picatinny Arsenal. Prospective offerors shall register at least 3 business days prior to the date of the Pre-Proposal Site Conference by supplying the following information. Names of individuals attending and US citizenship status, associated company names, addresses and telephone numbers. Information shall be sent via facsimile (Fax) transmission to Ms. Heather Durr, Picatinny Residency, Telephone: 973-989-9265, Fax: 973-989-8980. Prospective Offerors should call to ensure Fax is received. Prospective offerors should arrive at least 90 minutes prior to Pre-Proposal Conference for processing in at the Main Gate Visitor Control Center. Visitors and/or vehicles will not be permitted access to Picatinny Arsenal without prior registration and the following: Employment Eligibility Form, INS Form I-9 (if not a US Citizen). Driver's License or other type of approved photo identification. Current vehicle registration, insurance, and DMV inspection sticker. Visitors without Military ID, No DoD sticker on their vehicle, and picking up a camera pass may need to allow an additional 2 hours from their arrival time at the Main Gate before arriving at the meeting site.

Visitor Notification/Registration Form
(Form must be transmitted to Corps of Engineers via *email*, only to – Robert.T.Moran@usace.army.mil and Heather.Durr@usace.army.mil)

Visitor's Name(s): May indicate additional visitors here if **all** information below is the same for each visitor. Otherwise, submit new form (i.e. submit separate forms for Drivers and Passengers, etc.).	1. 2. 3.		
Visitor's Employer:			
Employer's Address:			
Employer's Tel. #:			
Purpose of Visit:	Pre-proposal site conference for Explosive R&D Loading Facility project.		
U.S. Citizen ?	**Yes:**	**No:**	
Enclosure Access Needed ?	**Yes: X**	**No:**	
Duration of Visit: **(Arrival date to end date)**			

Will visitor have a vehicle ? (If yes, fill-in vehicle info below)	**Yes:**	**No:** (passenger)	
Vehicle Make:			
Vehicle Model:			
License Plate No:			
Prime Contractor POC:			
Government POC:	Heather Durr, Project Engineer: 973-989-0802		
Location of Work/Visit:	Robinson Enclosure; 200 Area, Bldg 3002		

Note:

1. All visitor requests must be submitted to the US Army Corps of Engineers office, POCs identified above, at **least five (5) business days prior** to the person(s)' scheduled visit to Picatinny. Failure to adhere to all requirements shall be cause for the Security Division to deny entrance the Installation.
2. Visitors should allow at least 2 hours once arriving at the main gate for processing at Visitor Control, vehicle search, and arrival at pre-proposal site conference. Processing time may be greater during the hours of 8-10am, so please plan ahead.
3. Status change in any information previously provided (including change in vehicle) to obtain a Visitor Pass/ID Badge shall render that Visitor Pass/ID Badge invalid, and shall require re-notification as indicated above, and re-processing at the Visitor Control Center.
4. If vehicle is a Government Vehicle or rental vehicle, just indicate this in the vehicle info blocks.
5. Government personnel with Government ID, need not register. Government personnel with Government ID; but, using their POV, must pre-register their POV as indicated above.
6. Visitors and/or vehicles will not be permitted access to Picatinny without prior registration and the following: Employment Eligibility Form, INS Form I-9 (if not a US citizen), Driver's license or other type of approved photo identification.
7. Vehicle operators must possess current vehicle registration, insurance, DMV inspection sticker, and driver's license.

Camera Pass Request

Cameras of any type, including video recorders and/or cell phone cameras, are prohibited within Picatinny without prior authorization via *email* at least five (5) business days in advance to Robert.T.Moran@usace.army.mil and Heather.Durr@usace.army.mil).

Request the following person be issued a camera pass for the period of **DATE** to **DATE**.

PURPOSE FOR CAMERA: The person identified below is required to take pictures of the project site at Picatinny as part of proposal development for the Explosive R&D Loading Facility contract solicitation and will be using the camera at the 200 Area of the Installation.

INDIVIDUAL'S NAME:

The camera information is as follows:

MAKE:

MODEL:

SERIAL NUMBER:

Note:
Approved camera pass will be available on the day of the visit and must be picked up by the person who is listed above as the camera operator at the Picatinny Police Headquarters building. Picture ID must be shown. It's suggested that directions to Police HQ be secured at Visitor Control when picking up visitor pass.

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0001		1	Lump Sum		

Design/Build
FFP
of Explosion Research and Development Loading Facility Administration Component, Site Work: All site work, including utilities, associated with the design and construction of the administration component, complete.
PURCHASE REQUEST NUMBER: W16ROE-4100-7736

NET AMT

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0002		1	Lump Sum		

Design/Build
FFP
of Explosion Research and Development Loading Facility Administration Component, Building. All work associated with the Design and construction of the administration component, complete.

NET AMT

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0003		1	Lump Sum		

Design/Build
FFP
of Explosion Research and Development Loading Facility Explosive Processing and Explosive Machining components, site work: All site work associated with the Design and Construction of the explosive processing and explosive machining components, complete.

NET AMT

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0004		1	Lump Sum		

Design/Build
FFP
of Explosion Research and Development Loading Facility explosive processing and explosive machining components, building: All work associated with the design and construction of the explosive processing and explosive machinning components, complete.

NET AMT

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0005		1	Lump Sum		
	Design/ Build FFP Of Explosion Research and Development Loading Facility Explosive storage component, site work: Allsite work associated with the design and construction of the explosive storage, complete.				
				NET AMT	

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0006		1	Lump Sum		
	Design/Build FFP of Explosion Research and Development Loading facility explosive storage component, building: all work associated with the Design and Construction of the Explosive storage component, complete.				
				NET AMT	

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0007		1	Lump Sum		
OPTION	Option 1: Design/Build FFP of upgrade of exterior of building 225: All work associated with the design and construction of the refinishing of the exterior of the building 225 to be architecturally compatible with other components of the project, complete (if exercised), including required asbestos survey and abatement, demolition and new constuction.				
				NET AMT	

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0008		1	Lump Sum		
OPTION	Option 2: Design/Build FFP of enclosed 8 foot walkway between explosive research and development loading facility and building 225, complete: All work associated with the design and construction of the enclosed walkway from the explosive processing and explosive machining components to building 225, complete (if exercised), including sitework, foundations, framing, translucent siding, roofing, lighting, entry and exit doors.				
				NET AMT	

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0009		1	Lump Sum		
OPTION	Option 3: Design/Build FFP of enclosed 8 foot walkway between explosive research and development loading facility and the administration component, complete: All work associated with the design and construction of the enclosed walkway from the explosive processing and explosive machining components to the administration component, complete (if exercised), including sitework, foundations, framing, translucent siding, roofing, lighting, entry and exit doors.				
				NET AMT	

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0010		1	Dollars, U.S.		
	Project Punch List FFP This line applies to all punch list items including those items identified at the prefinal and final inspections and is above the normal retainage for this item. Offerors shall include this amount in the bid price (50,000.00). This amount shall not be changed. This amount shall be retained by the Government in the event contractor fails to complete punch list items. This amount is separate from liquidated damages to be applied in the event the contractor fails to complete the work within the time specified in the contract including any extensions. See Section 00800 for additional information.				
				NET AMT	

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0011		1	Dollars, U.S.		
	As-Built FFP Drawings Per The 00800 Section For Design Build a modern, approximately 28,000 square feet functionally configured explosive research and development facility, Picatinny, New Jersey (No partial payments will be provided until final acceptance of this item). (15,000.00)				

NET AMT

FOB: Destination

TOTAL:
TOTAL BASE BID FOR LINE ITEMS 0001 – 0006

$_____

TOTAL OPTIONS FOR LINE ITEMS 0007 - 0009

$_____

TOTAL PUNCH LIST
& AS-BUILT DRAWINGS(LINE ITEMS 0010 – 0011) ($65,000.00)

TOTAL BASE BID (LINE ITEMS 0001 – 00011)
PLUS OPTIONS

$_____

EXERCISE OPTION PERIOD
Options may be exercised within 180 calendar days after award of the contract.

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52.203-11 CERTIFICATION AND DISCLOSURE REGARDING PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS (APR 1991)

(a) The definitions and prohibitions contained in the clause, at FAR 52.203-12, Limitation on Payments to Influence Certain Federal Transactions, included in this solicitation, are hereby incorporated by reference in paragraph (b) of

this Certification.

(b) The offeror, by signing its offer, hereby certifies to the best of his or her knowledge and belief that on or after December 23, 1989,--

(1) No Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress on his or her behalf in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment or modification of any Federal contract, grant, loan, or cooperative agreement;

(2) If any funds other than Federal appropriated funds (including profit or fee received under a covered Federal transaction) have been paid, or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress or an employee of a Member of Congress on his or her behalf in connection with this solicitation, the offeror shall complete and submit, with its offer, OMB standard form LLL, Disclosure of Lobbying Activities, to the Contracting Officer; and

(3) He or she will include the language of this certification in all subcontract awards at any tier and require that all recipients of subcontract awards in excess of $100,000 shall certify and disclose accordingly.

(c) Submission of this certification and disclosure is a prerequisite for making or entering into this contract imposed by section 1352, title 31, United States Code. Any person who makes an expenditure prohibited under this provision, shall be subject to a civil penalty of not less than $10,000, and not more than $100,000, for each such failure.

(End of provision)

52.223-13 CERTIFICATION OF TOXIC CHEMICAL RELEASE REPORTING (AUG 2003)

(a) Executive Order 13148, of April 21, 2000, Greening the Government through Leadership in Environmental Management, requires submission of this certification as a prerequisite for contract award.

(b) By signing this offer, the offeror certifies that--

(1) As the owner or operator of facilities that will be used in the performance of this contract that are subject to the filing and reporting requirements described in section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) (42 U.S.C. 11023) and section 6607 of the Pollution Prevention Act of 1990 (PPA) (42 U.S.C. 13106), the offeror will file and continue to file for such facilities for the life of the contract the Toxic Chemical Release Inventory Form (Form R) as described in sections 313(a) and (g) of EPCRA and section 6607 of PPA; or

(2) None of its owned or operated facilities to be used in the performance of this contract is subject to the Form R filing and reporting requirements because each such facility is exempt for at least one of the following reasons: (Check each block that is applicable.)

( ) (i) The facility does not manufacture, process, or otherwise use any toxic chemicals listed in 40 CFR 372.65;

( ) (ii) The facility does not have 10 or more full-time employees as specified in section 313.(b)(1)(A) of EPCRA 42 U.S.C. 11023(b)(1)(A);

( ) (iii) The facility does not meet the reporting thresholds of toxic chemicals established under section 313(f) of EPCRA, 42 U.S.C. 11023(f) (including the alternate thresholds at 40 CFR 372.27, provided an appropriate certification form has been filed with EPA);

( ) (iv) The facility does not fall within the following Standard Industrial Classification (SIC) codes or their corresponding North American Industry Classification System sectors:

(A) Major group code 10 (except 1011, 1081, and 1094.

(B) Major group code 12 (except 1241).

(C) Major group codes 20 through 39.

(D) Industry code 4911, 4931, or 4939 (limited to facilities that combust coal and/or oil for the purpose of generating power for distribution in commerce).

(E) Industry code 4953 (limited to facilities regulated under the Resource Conservation and Recovery Act, Subtitle C (42 U.S.C. 6921, et seq.), 5169, 5171, or 7389 (limited to facilities primarily engaged in solvent recovery services on a contract or fee basis); or

( ) (v) The facility is not located within the United States or its outlying areas.

(End of clause)

Section 00100 - Bidding Schedule/Instructions to Bidders

BID BOND LANGUAGE
US ARMY ENGINEER DISTRICT, NEW YORK

REQUEST FOR PROPOSAL NO: W912DS-04-R-0006

CHECK LIST FOR OFFERORS

ATTACHED IS RFP NO: W912DS-04-R-0006
Design Build a modern, approximately 28,000 Square Feet functionally configured explosive Research and Development facility, Picatinny, New Jersey.

ALL INFORMATION REQUIRED BY THE TERMS OF THIS SOLICITATION MUST BE FURNISHED. MISTAKES OR OMISSIONS MAY RENDER YOUR BID INELIGIBLE FOR AWARD. IMPORTANT ITEMS FOR YOU TO CHECK ARE INCLUDED IN BUT NOT LIMITED TO THOSE LISTED BELOW. THIS INFORMATION IS FURNISHED ONLY TO ASSIST YOU IN SUBMITTING A PROPER BID.

- HAVE YOU ACKNOWLEDGED ALL AMENDMENTS?
- HAVE YOU COMPLETED THE "REPRESENTATIONS AND CERTIFICATIONS" (SECTION 00600) PORTION OF THE SOLICITATION?
- IS YOUR DUNS NUMBER LISTED ON THE STANDARD FORM 1442?
- IS YOUR OFFER PROPERLY SIGNED?
- A BID BOND IS REQUIRED. HAS YOUR SURETY PROVIDED YOU WITH A BID BOND ON STANDARD FORM 24 (SF 24) OR A SIMILAR FORM CONTAINING THE SAME LANGUAGE AS A STANDARD FORM 24?
- IS YOUR BID GUARANTEE IN THE PROPER AMOUNT?
- IS YOUR BID GUARANTEE PROPERLY SIGNED BY BOTH THE OFFEROR AND SURETY AND ARE ALL REQUIRED SEALS AFFIXED?
- DO THE BID BOND AND ACCOMPANYING DOCUMENTS BEAR SIGNATURES AND SEALS AFFIXED **AFTER** THE DOCUMENT WAS GENERATED, AS OPPOSED TO COMPUTER PRINTER-GENERATED SIGNATURES AND/OR SEALS?
- IS THE NAME IN WHICH YOU SUBMITTED THE OFFER THE SAME ON YOUR OFFER AS ON THE BID BOND?
- IS YOUR BID BOND INCLUDED WITH YOUR OFFER? (A LATE OFFER GUARANTEE IS TREATED THE SAME AS A LATE OFFER)
- HAVE YOU ENSURED THAT YOU HAVE NOT RESTRICTED YOUR OFFER BY ALTERING THE PROVISIONS OF THE SOLICITATION?
- WHEN REQUIRED, HAVE YO ENTERED A UNIT PRICE FOR EACH BID ITEM? (THE SOLICITATION SPECIFICALLY STATES WHEN THIS IS NECESSARY).
- ARE DECIMALS IN YOUR PRICES IN THE PROPER PLACE? ARE YOUR FIGURES LEGIBLE?

- IF YOU HAVE MADE ERASURES OR CORRECTIONS ON YOUR OFFER, ARE THEY INITIALED BY THE PERSON SIGNING THE OFFER?

- DOES THE ENVELOPE CONTAINING YOUR OFFER PROPERLY IDENTIFY THAT IT IS A PROPOSAL AND DOES IT CONTAIN THE CORRECT SOLICITATION NUMBER AND TIME OFFERS ARE DUE?

- WILL YOUR OFFER ARRIVE ON TIME? (SEE PARAGRAPH ENTITLED "LATE SUBMISSIONS, MODIFICATIONS, AND WITHDRAWALS OF BIDS" IN THE INSTRUCTIONS, CONDITIONS, AND NOTICES TO BUDDERS, SECTION 00100 OF THE SOLICITATION).

- **NOTE:** THERE ARE INCREASED SUCURITY MEASURES AT JACOB K. JAVITS FEDERAL BUILDING, 26 FEDERAL PLAZA THAT MAY AFFECT THE TIME IT TAKES TO ENTER THE BUILDING. OFFERORS ARE RESPONSIBLE TO ENSURE THAT ITS OFFER IS SUBMITTED TIMELY.

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52.204-6 DATA UNIVERSAL NUMBERING SYSTEM (DUNS) NUMBER (OCT 2003)

(a) The offeror shall enter, in the block with its name and address on the cover page of its offer, the annotation "DUNS" or "DUNS+4" followed by the DUNS number or "DUNS+4" that identifies the offeror's name and address exactly as stated in the offer. The DUNS number is a nine-digit number assigned by Dun and Bradstreet, Inc. The DUNS+4 is the DUNS number plus a 4-character suffix that may be assigned at the discretion of the offeror to establish additional CCR records for identifying alternative Electronic Funds Transfer (EFT) accounts (see Subpart 32.11) for the same parent concern.

(b) If the offeror does not have a DUNS number, it should contact Dun and Bradstreet directly to obtain one.

(1) An offeror may obtain a DUNS number--

(i) If located within the United States, by calling Dun and Bradstreet at 1-866-705-5711 or via the Internet at http://www.dnb.com; or

(ii) If located outside the United States, by contacting the local Dun and Bradstreet office.

(2) The offeror should be prepared to provide the following information:

(i) Company legal business name.

(ii) Tradestyle, doing business, or other name by which your entity is commonly recognized.

(iii) Company physical street address, city, state and Zip Code.

(iv) Company mailing address, city, state and Zip Code (if separate from physical).

(v) Company telephone number.

(vi) Date the company was started.

(vii) Number of employees at your location.

(viii) Chief executive officer/key manager.

(ix) Line of business (industry).

(x) Company Headquarters name and address (reporting relationship within your entity).

(End of provision)

52.214-4 FALSE STATEMENTS IN BIDS (APR 1984)

Bidders must provide full, accurate, and complete information as required by this solicitation and its attachments. The penalty for making false statements in bids is prescribed in 18 U.S.C. 1001.

(End of provision)

52.214-6 EXPLANATION TO PROSPECTIVE BIDDERS (APR 1984)

Any prospective bidder desiring an explanation or interpretation of the solicitation, drawings, specifications, etc., must request it in writing soon enough to allow a reply to reach all prospective bidders before the submission of their bids. Oral explanations or instructions given before the award of a contract will not be binding. Any information given a prospective bidder concerning a solicitation will be furnished promptly to all other prospective bidders as an amendment to the solicitation, if that information is necessary in submitting bids or if the lack of it would be prejudicial to other prospective bidders.

(End of provision)

52.215-1 INSTRUCTIONS TO OFFERORS--COMPETITIVE ACQUISITION (JAN 2004)

(a) Definitions. As used in this provision--

“Discussions” are negotiations that occur after establishment of the competitive range that may, at the Contracting Officer's discretion, result in the offeror being allowed to revise its proposal.

“In writing or written” means any worded or numbered expression which can be read, reproduced, and later communicated, and includes electronically transmitted and stored information.

“Proposal modification” is a change made to a proposal before the solicitation's closing date and time, or made in response to an amendment, or made to correct a mistake at any time before award.

“Proposal revision” is a change to a proposal made after the solicitation closing date, at the request of or as allowed by a Contracting Officer as the result of negotiations.

“Time”, if stated as a number of days, is calculated using calendar days, unless otherwise specified, and will include Saturdays, Sundays, and legal holidays. However, if the last day falls on a Saturday, Sunday, or legal holiday, then the period shall include the next working day.

(b) Amendments to solicitations. If this solicitation is amended, all terms and conditions that are not amended remain unchanged. Offerors shall acknowledge receipt of any amendment to this solicitation by the date and time specified in the amendment(s).

(c) Submission, modification, revision, and withdrawal of proposals. (1) Unless other methods (e.g., electronic commerce or facsimile) are permitted in the solicitation, proposals and modifications to proposals shall be submitted in paper media in sealed envelopes or packages (i) addressed to the office specified in the solicitation, and (ii) showing the time and date specified for receipt, the solicitation number, and the name and address of the offeror. Offerors using commercial carriers should ensure that the proposal is marked on the outermost wrapper with the information in paragraphs (c)(1)(i) and (c)(1)(ii) of this provision.

(2) The first page of the proposal must show--

(i) The solicitation number;

(ii) The name, address, and telephone and facsimile numbers of the offeror (and electronic address if available);

(iii) A statement specifying the extent of agreement with all terms, conditions, and provisions included in the solicitation and agreement to furnish any or all items upon which prices are offered at the price set opposite each item;

(iv) Names, titles, and telephone and facsimile numbers (and electronic addresses if available) of persons authorized to negotiate on the offeror's behalf with the Government in connection with this solicitation; and

(v) Name, title, and signature of person authorized to sign the proposal. Proposals signed by an agent shall be accompanied by evidence of that agent's authority, unless that evidence has been previously furnished to the issuing office.

(3) Submission, modification, or revision, of proposals.

(i) Offerors are responsible for submitting proposals, and any modifications, or revisions, so as to reach the Government office designated in the solicitation by the time specified in the solicitation. If no time is specified in the solicitation, the time for receipt is 4:30 p.m., local time, for the designated Government office on the date that proposal or revision is due.

(ii)(A) Any proposal, modification, or revision received at the Government office designated in the solicitation after the exact time specified for receipt of offers is “late” and will not be considered unless it is received before award is made, the Contracting Officer determines that accepting the late offer would not unduly delay the acquisition; and--

(1) If it was transmitted through an electronic commerce method authorized by the solicitation, it was received at the initial point of entry to the Government infrastructure not later than 5:00 p.m. one working day prior to the date specified for receipt of proposals; or

(2) There is acceptable evidence to establish that it was received at the Government installation designated for receipt of offers and was under the Government's control prior to the time set for receipt of offers; or

(3) It is the only proposal received.

(B) However, a late modification of an otherwise successful proposal that makes its terms more favorable to the Government, will be considered at any time it is received and may be accepted.

(iii) Acceptable evidence to establish the time of receipt at the Government installation includes the time/date stamp of that installation on the proposal wrapper, other documentary evidence of receipt maintained by the installation, or oral testimony or statements of Government personnel.

(iv) If an emergency or unanticipated event interrupts normal Government processes so that proposals cannot be received at the office designated for receipt of proposals by the exact time specified in the solicitation, and urgent Government requirements preclude amendment of the solicitation, the time specified for receipt of proposals will be deemed to be extended to the same time of day specified in the solicitation on the first work day on which normal Government processes resume.

(v) Proposals may be withdrawn by written notice received at any time before award. Oral proposals in response to oral solicitations may be withdrawn orally. If the solicitation authorizes facsimile proposals, proposals may be withdrawn via facsimile received at any time before award, subject to the conditions specified in the provision at 52.215-5, Facsimile Proposals. Proposals may be withdrawn in person by an offeror or an authorized representative, if the identity of the person requesting withdrawal is established and the person signs a receipt for the proposal before award.

(4) Unless otherwise specified in the solicitation, the offeror may propose to provide any item or combination of items.

(5) Offerors shall submit proposals in response to this solicitation in English, unless otherwise permitted by the solicitation, and in U.S. dollars, unless the provision at FAR 52.225-17, Evaluation of Foreign Currency Offers, is included in the solicitation.

(6) Offerors may submit modifications to their proposals at any time before the solicitation closing date and time, and may submit modifications in response to an amendment, or to correct a mistake at any time before award.

(7) Offerors may submit revised proposals only if requested or allowed by the Contracting Officer.

(8) Proposals may be withdrawn at any time before award. Withdrawals are effective upon receipt of notice by the Contracting Officer.

(d) Offer expiration date. Proposals in response to this solicitation will be valid for the number of days specified on the solicitation cover sheet (unless a different period is proposed by the offeror).

(e) Restriction on disclosure and use of data. Offerors that include in their proposals data that they do not want disclosed to the public for any purpose, or used by the Government except for evaluation purposes, shall--

(1) Mark the title page with the following legend: This proposal includes data that shall not be disclosed outside the Government and shall not be duplicated, used, or disclosed--in whole or in part--for any purpose other than to evaluate this proposal. If, however, a contract is awarded to this offeror as a result of--or in connection with-- the submission of this data, the Government shall have the right to duplicate, use, or disclose the data to the extent provided in the resulting contract. This restriction does not limit the Government's right to use information contained in this data if it is obtained from another source without restriction. The data subject to this restriction are contained in sheets [insert numbers or other identification of sheets]; and

(2) Mark each sheet of data it wishes to restrict with the following legend: Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this proposal.

(f) Contract award. (1) The Government intends to award a contract or contracts resulting from this solicitation to the responsible offeror(s) whose proposal(s) represents the best value after evaluation in accordance with the factors and subfactors in the solicitation.

(2) The Government may reject any or all proposals if such action is in the Government's interest.

(3) The Government may waive informalities and minor irregularities in proposals received.

(4) The Government intends to evaluate proposals and award a contract without discussions with offerors (except clarifications as described in FAR 15.306(a)). Therefore, the offeror's initial proposal should contain the offeror's best terms from a cost or price and technical standpoint. The Government reserves the right to conduct discussions if the Contracting Officer later determines them to be necessary. If the Contracting Officer determines that the number of proposals that would otherwise be in the competitive range exceeds the number at which an efficient competition can be conducted, the Contracting Officer may limit the number of proposals in the competitive range to the greatest number that will permit an efficient competition among the most highly rated proposals.

(5) The Government reserves the right to make an award on any item for a quantity less than the quantity offered, at the unit cost or prices offered, unless the offeror specifies otherwise in the proposal.

(6) The Government reserves the right to make multiple awards if, after considering the additional administrative costs, it is in the Government's best interest to do so.

(7) Exchanges with offerors after receipt of a proposal do not constitute a rejection or counteroffer by the Government.

(8) The Government may determine that a proposal is unacceptable if the prices proposed are materially unbalanced between line items or subline items. Unbalanced pricing exists when, despite an acceptable total evaluated price, the price of one or more contract line items is significantly overstated or understated as indicated by the application of cost or price analysis techniques. A proposal may be rejected if the Contracting Officer determines that the lack of balance poses an unacceptable risk to the Government.

(9) If a cost realism analysis is performed, cost realism may be considered by the source selection authority in evaluating performance or schedule risk.

(10) A written award or acceptance of proposal mailed or otherwise furnished to the successful offeror within the time specified in the proposal shall result in a binding contract without further action by either party.

(11) If a post-award debriefing is given to requesting offerors, the Government shall disclose the following information, if applicable:

(i) The agency's evaluation of the significant weak or deficient factors in the debriefed offeror's offer.

(ii) The overall evaluated cost or price and technical rating of the successful and the debriefed offeror and past performance information on the debriefed offeror.

(iii) The overall ranking of all offerors, when any ranking was developed by the agency during source selection.

(iv) A summary of the rationale for award.

(v) For acquisitions of commercial items, the make and model of the item to be delivered by the successful offeror.

(vi) Reasonable responses to relevant questions posed by the debriefed offeror as to whether source-selection procedures set forth in the solicitation, applicable regulations, and other applicable authorities were followed by the agency.

(End of provision)

52.233-2 SERVICE OF PROTEST (AUG 1996)

(a) Protests, as defined in section 33.101 of the Federal Acquisition Regulation, that are filed directly with an agency, and copies of any protests that are filed with the General Accounting Office (GAO), shall be served on the Contracting Officer (addressed as follows) by obtaining written and dated acknowledgment of receipt from _____. (Contracting Officer designate the official or location where a protest may be served on the Contracting Officer.)

(b) The copy of any protest shall be received in the office designated above within one day of filing a protest with the GAO.

(End of provision)

52.236-27 SITE VISIT (CONSTRUCTION) (FEB 1995)

(a) The clauses at 52.236-2, Differing Site Conditions, and 52.236-3, Site Investigations and Conditions Affecting the Work, will be included in any contract awarded as a result of this solicitation. Accordingly, offerors or quoters are urged and expected to inspect the site where the work will be performed.

(b) Site visits may be arranged during normal duty hours by contacting:

Name: Heather Durr
Address: Picatinny Arsenal, Picatinny, New Jersey
Telephone: 973-989-0802

(End of provision)

52.236-28 PREPARATION OF PROPOSALS--CONSTRUCTION (OCT 1997)

(a) Proposals must be (1) submitted on the forms furnished by the Government or on copies of those forms, and (2) manually signed. The person signing a proposal must initial each erasure or change appearing on any proposal form.

(b) The proposal form may require offerors to submit proposed prices for one or more items on various bases, including--

(1) Lump sum price;

(2) Alternate prices;

(3) Units of construction; or

(4) Any combination of paragraphs (b)(1) through (b)(3) of this provision.

(c) If the solicitation requires submission of a proposal on all items, failure to do so may result in the proposal being rejected without further consideration. If a proposal on all items is not required, offerors should insert the words “no proposal” in the space provided for any item on which no price is submitted.

(d) Alternate proposals will not be considered unless this solicitation authorizes their submission.

(End of provision)

252.204-7004 REQUIRED CENTRAL CONTRACTOR REGISTRATION ALTERNATE A (NOV 2003)

(a) Definitions. As used in this clause--

“Central Contractor Registration (CCR) database” means the primary Government repository for contractor information required for the conduct of business with the Government.

“Commercial and Government Entity (CAGE) code” means--

(1) A code assigned by the Defense Logistics Information Service (DLIS) to identify a commercial or Government entity; or

(2) A code assigned by a member of the North Atlantic Treaty Organization that DLIS records and maintains in the CAGE master file. This type of code is known as an “NCAGE code.”

“Data Universal Numbering System (DUNS) number” means the 9-digit number assigned by Dun and Bradstreet, Inc. (D&B) to identify unique business entities.

“Data Universal Numbering System +4 (DUNS+4) number” means the DUNS number assigned by D&B plus a 4-character suffix that may be assigned by a business concern. (D&B has no affiliation with this 4-character suffix.) This 4-character suffix may be assigned at the discretion of the business concern to establish additional CCR records for identifying alternative Electronic Funds Transfer (EFT) accounts (see Subpart 32.11 of the Federal Acquisition Regulation) for the same parent concern.

“Registered in the CCR database” means that--

(1) The Contractor has entered all mandatory information, including the DUNS number or the DUNS+4 number, into the CCR database;

(2) The Contractor's CAGE code is in the CCR database; and

(3) The Government has validated all mandatory data fields and has marked the records “Active.”

(b)(1) By submission of an offer, the offeror acknowledges the requirement that a prospective awardee shall be registered in the CCR database prior to award, during performance, and through final payment of any contract, basic agreement, basic ordering agreement, or blanket purchasing agreement resulting from this solicitation.

(2) The offeror shall enter, in the block with its name and address on the cover page of its offer, the annotation “DUNS” or “DUNS +4” followed by the DUNS or DUNS +4 number that identifies the offeror's name and address exactly as stated in the offer. The DUNS number will be used by the Contracting Officer to verify that the offeror is registered in the CCR database.

(c) If the offeror does not have a DUNS number, it should contact Dun and Bradstreet directly to obtain one.

(1) An offeror may obtain a DUNS number--

(i) If located within the United States, by calling Dun and Bradstreet at 1-866-705-5711 or via the Internet at http://www.dnb.com; or

(ii) If located outside the United States, by contacting the local Dun and Bradstreet office.

(2) The offeror should be prepared to provide the following information:

(i) Company legal business.

(ii) Tradestyle, doing business, or other name by which your entity is commonly recognized.

(iii) Company Physical Street Address, City, State, and Zip Code.

(iv) Company Mailing Address, City, State and Zip Code (if separate from physical).

(v) Company Telephone Number.

(vi) Date the company was started.

(vii) Number of employees at your location.

(viii) Chief executive officer/key manager.

(ix) Line of business (industry).

(x) Company Headquarters name and address (reporting relationship within your entity).

(d) If the Offeror does not become registered in the CCR database in the time prescribed by the Contracting Officer, the Contracting Officer will proceed to award to the next otherwise successful registered Offeror.

(e) Processing time, which normally takes 48 hours, should be taken into consideration when registering. Offerors who are not registered should consider applying for registration immediately upon receipt of this solicitation.

(f) The Contractor is responsible for the accuracy and completeness of the data within the CCR database, and for any liability resulting from the Government's reliance on inaccurate or incomplete data. To remain registered in the CCR database after the initial registration, the Contractor is required to review and update on an annual basis from the date of initial registration or subsequent updates its information in the CCR database to ensure it is current, accurate and complete. Updating information in the CCR does not alter the terms and conditions of this contract and is not a substitute for a properly executed contractual document.

(g)(1)(i) If a Contractor has legally changed its business name, “doing business as” name, or division name (whichever is shown on the contract), or has transferred the assets used in performing the contract, but has not completed the necessary requirements regarding novation and change-of-name agreements in Subpart 42.12, the Contractor shall provide the responsible Contracting Officer a minimum of one business day's written notification of its intention to (A) change the name in the CCR database; (B) comply with the requirements of Subpart 42.12 of the FAR; and (C) agree in writing to the timeline and procedures specified by the responsible Contracting Officer. The Contractor must provide with the notification sufficient documentation to support the legally changed name.

(ii) If the Contractor fails to comply with the requirements of paragraph (g)(1)(i) of this clause, or fails to perform the agreement at paragraph (g)(1)(i)(C) of this clause, and, in the absence of a properly executed novation or change-of-name agreement, the CCR information that shows the Contractor to be other than the Contractor indicated in the contract will be considered to be incorrect information within the meaning of the “Suspension of Payment” paragraph of the electronic funds transfer (EFT) clause of this contract.

(2) The Contractor shall not change the name or address for EFT payments or manual payments, as appropriate, in the CCR record to reflect an assignee for the purpose of assignment of claims (see FAR Subpart 32.8, Assignment of Claims). Assignees shall be separately registered in the CCR database. Information provided to the Contractor's CCR record that indicates payments, including those made by EFT, to an ultimate recipient other than that Contractor will

be considered to be incorrect information within the meaning of the “Suspension of payment” paragraph of the EFT clause of this contract.

(h) Offerors and Contractors may obtain information on registration and annual confirmation requirements via the internet at http://www.ccr.gov or by calling 1-888-227-2423, or 269-961-5757.

(End of clause)

Volume 1 will be comprised of the technical and performance capabilities and bid schedule inclusive of base and any optional items. Offerors will comply with items contained within the RFP for compiling the Volume 1 documents. Offerors will be required to limit Volume 1 to no more than Two Hundred Twenty-Five (225) pages, 81/2" x 11" paper in one (1) 3 ring-ring binder. Drawings (11"x17" maximum size), charts and tab page identifiers are excluded from the page limit. All pages shall be numbered sequentially starting with number "1" and clearly visible at the bottom of each page. Pages excluded from the page count shall not be numbered. All information beyond page Two Hundred Twenty-five (225), aside from exclusions previously mentioned will neither be read and/or evaluated. Contents should be precise, relevant, and related to the RFP.

Volume 2 will be comprised of the price proposal. Offerors will base their proposal on items contained within the RFP. Offerors will be required to provide Volume 2 on 8 ½" x 11" paper in one (1) 3-ring binder. A summary sheet should be provided that identifies individual cost for each base bid item including any subtotal as well as total cost. In addition, there should be a separate summary sheet that identifies each optional item with individual cost as well as total cost for all optional items identified.

Do not submit any material not required by this solicitation (such as company or system brochures). Offerors must meet all technical portions (design/construction criteria) of the RFP. The fact that section 01010 and many of the drawings is not required to be submitted and evaluated does not relieve the Offerors from meeting all technical or other requirements of the RFP.

2.2 Where to Submit

Offerors shall submit their proposal to the United States Army Corps of Engineers (USACE) at the address shown in Block 8 of Standard Form 1442.

2.3 Submission deadline

USACE must receive proposals not later than the time and date specified in Block 13 of Standard Form 1442.

2.4 Incurring Costs

The Government is not liable for any costs incurred by the Offeror submitting an offer in response to this solicitation.

2.5 Format Requirements

All proposals shall contain the volume number and the name, address and telephone number of the Prime and Joint Venture, or other entity identified on the cover. The

original proposal must be clearly marked, as “ORIGINAL” and the original signatures must be in blue ink. Copies of the proposals must also be clearly marked as “COPY x of y (i.e. COPY 1 of 6).” Proposal clarity and material organization in each volume are mandatory. No material shall be incorporated by reference.

Each volume will be submitted separately bound. The proposal shall address and contain the information listed below. The information will be used by the source Selection Board to evaluate each proposal. Offerors are advised that conciseness and relevance of the proposal is important and unrelated information will not be evaluated. Proposals that provide only superficial coverage of the information required below might not receive additional consideration may be excluded from the competitive range. Additionally, should the proposal include any standard company terms that conflict with the terms and conditions of the solicitation, the proposal may be determined to be “unacceptable” and thus ineligible for award.

3.0 VOLUME 1 – TECHNICAL PROPOSAL (VOLUME 1)

The technical proposal shall be submitted in one three-ring binder with tabbed dividers separating the main sections with a detailed Table of Contents and List of Appendixes, labeled “Volume 1 – Technical Proposal.” The sections shall parallel the submission requirements identified below. Provide six copies of bound material (folded and bound in Volume 1).

3.1 Introduction (SHALL NOT BE EVALUATED)

The introduction shall include the following information:

a. Name and address of organization
b. B. Location of the principal office.
c. The type of organization

SECTION 00120

PROPOSAL EVALUATION AND CONTRACT AWARD

1.0 TECHNICAL/QUALITY EVALUATION

1.1.1 Submittal Requirements

a. The Offeror will be required to submit their proposal in two separate Volumes. Volume 1 will be comprised of the technical and performance capabilities. Volume 2 will be comprised of the price proposal. The Bid Schedule, Base and Option items contained in the RFP will be the document to use for compiling the price proposal. Offerors will be required to limit Volume 1 to no more than Two Hundred and twenty five (225) pages in one (1) 3-ring binder. Drawings (11"x17" maximum size), Charts, and tab page identifiers are excluded from the page limits. All information beyond page Two Hundred and twenty-five (225) will not be either read or evaluated. Contents should be precise and related to the RFP.

b. Be advised to organize the submitted material sequentially under the correct tab and number all pages to facilitate the evaluation. Material not organized under the appropriate tab and in the sequence of the sub-paragraphs, may easily be overlooked during the evaluation.

1.2 Quality Evaluation and Scoring system(s)

1.2.1 The SSEB will perform an in-dept review of the proposals. The SSEB will rate each evaluation factor and sub-factor for each proposal against the specified evaluation criteria in the Request for Proposal (RFP). The evaluation committee will not compare proposals against each other.

1.2.2 The evaluation factors and sub-factors are listed below. All factors and sub-factors will be color rated in accordance with the rating sheet prepared by the SSEB.

The Offerors shall submit with their proposal, sufficient material to permit evaluation of the criteria listed below. Submission requirement are described in Section 00010, Submission Requirements and Instructions.

1.2.2.1 Proposal Submission: The Proposal shall meet the submission and format requirements.

1.2.2.2 Volume 1 – Technical Proposal:

Introduction: The Offeror shall provide information on the organization with respect to name, type of organization, principal office location, number of years in business, and former names that the organization has operated under and Primary subcontractors and their role in the subject.

Do not submit any material not required by this solicitation (such as company or system brochures). It is assumed that the Offerors will meet all technical portions (design/construction criteria) of the RFP. The fact that section 01010 and the drawings are not evaluated factors during solicitation does not relieve the Offerors from meeting all technical, or other requirements of the RFP.

Factor 1 – Technical Proposal (Design); Building systems and site plan:

a. The Offeror shall submit 10 percent concept design including drawings and narratives to clearly illustrate the proposed building(s) and overall site layout. The Government has developed a suggested site layout (reference Site Safety Plan in the RFP). Floor plan drawing(s) identifying preferred functional adjacencies for buildings will be included in the RFP package. The concept design submittal shall meet the requirements of this section. In addition, the response to factor 1 should clearly demonstrate the Offerors knowledge, understanding, and compliance with the RFP, noting the importance of demonstrating knowledge of DA Pam 385-64 and the other technical references within the RFP. If the Offeror intends to propose modifications to the suggested Government site layout, such modifications must be presented as alternates within the Offeror's proposal. Offerors must clearly explain in the narrative and include documentation verifying explosive allowances for all building(s) have not been compromised based on the offeror's proposed alternative.

b. Building Plans and Narrative: The Offeror shall provide concept design floor plans for the proposed building(s). The narrative shall clearly define all major systems and materials proposed, to include though not be limited to the following: electrical, mechanical, telecommunication, fire alarm, sprinkler including deluge, drainage/containment system, wall and roof materials and window construction. Building floor plan(s) must indicate the functional layout and relationship to adjacent areas. The drawing should be to scale and reduced to fit on paper not exceeding 11" X 17". The Offeror shall submit sufficient documentation to identify the system components (catalog cuts, photos, etc.) and the levels of efficiency proposed for each system mentioned in the RFP. Roofing system and materials shall be clearly described. Sustainable design will also be considered with a minimum acceptable standard of bronze.

c. Building Section and Elevators: The Offeror shall provide a minimum of two sections of the building(s). One section shall be taken along the long axis of the building and the other perpendicular to the first. Each section shall illustrate all portions of the building from foundation to roof. In addition, the offeror shall provide exterior elevations of the building(s). One elevation shall depict the front elevation, including building entrance. The second elevation may be any other building elevation that best clarifies the proposed architectural features and clearly indicates materials to be used and their appearance. The drawings should be to scale and reduced to fit on sheets of paper not exceeding 11" X 17".

d. Building Structures: The Offeror shall provide preliminary foundation and framing plans for the building(s), which clearly indicate the proposed foundation types, building structural system, and roof-framing plan. The drawings should be to scale and reduced to fit on sheets of paper not exceeding 11" X 17". Offeror shall provide narrative for building structure and foundation.

Factor 2 – Contractor Past Relevant Experience of Offeror's Team: The Offerors shall submit documents in support of their past design build experience. Should the Offeror

be unable to demonstrate design build experience, documentation of design and construction experience will be considered.

a. Design Build Experience: Offeror should demonstrate recent and related experience within the last five years for explosive facilities, research and development facilities, or vertical design build projects of similar scope, magnitude and complexity.

b. Design Experience: Offerors who cannot demonstrate design build experience shall demonstrate recent and related design experience within the last five years for explosive facilities, research and development facilities, or vertical design projects of similar scope, magnitude and complexity.

c. Construction Experience: Offerors who cannot demonstrate design build experience shall demonstrate recent and related construction experience on projects within the last five years in which the Offeror was either the prime contractor or major subcontractor on projects, which were similar in scope, magnitude and complexity.

d. Project Fact Sheets

(i) Offerors will be required to document their past experience using the project fact sheets contained in the solicitation as well as in the appendix of the Source Selection Plan.

(ii) Offerors will be required to submit at least one (1) though not more than three (3) project fact sheets, demonstrating their design build, design, and /or construction experience regarding projects of similar scope, magnitude and complexity.

(iii) Fact Sheets must be completely filled in to qualify for consideration as acceptable (green). Incomplete facts sheets will not receive a rating higher than marginal (yellow). Clients referenced in the fact sheets may be contacted by the Source Selection Board.

(iv) Offerors must provide at least one (1) though no more than three (3) Project Fact Sheets for design build projects the Offeror started, completed, or was awarded within the last five years. The offeror shall identify relevant design build projects similar in scope, magnitude, and complexity [explosive environment], and must be able to identify experience with research and development or vertical construction design build projects.

(v) Offerors who cannot demonstrate design build experience shall demonstrate recent and related design experience by providing at least two (2) though no more than three (3) Project Fact Sheet for design projects that the Offeror started, completed, or was awarded within the last five years. The Offeror shall identify relevant projects similar in scope, magnitude and complexity [explosive environment], and should be able to identify experience with research and development projects or experience with vertical design projects.

(vi) Offerors who cannot demonstrate design build experience shall demonstrate recent and related construction

experience on projects must provide at least one (1) though no more than three (3) Project Fact Sheets for construction projects that the Offeror started, completed or was awarded within the last five years. The offeror shall identify relevant projects similar in scope, magnitude and complexity [explosive environment] and should be able to identify experience with research and development construction or experience with vertical construction projects.

(vii) Any project fact sheet provided beyond the maximum requested will not be reviewed or evaluated.

Factor 3 – Contractor Past Performance of Offeror's Team: This factor will contain the Offeror's past performance information. The Government believes that an Offeror's past performance and the degree to which an Offeror satisfied their customers in the past is a good predictor of future performance. The Government will evaluate the quality of each Offeror's performance on recent (within the past five years) and relevant projects. The Offeror must provide completed questionnaires as described below.

(i) Offerors past Clients shall be instructed to fax or send their completed questionnaires directly to the Corps of Engineers, Contract Specialist as noted on the questionnaire and received no later than 2:00 pm EST on date the solicitation closes. Offerors may submit no more than five (5) completed questionnaires in support of their past performance. The clock within the Corps New York District Contracting Division and/or the time stamped on the document from the fax machine will be used as the official clock for determining proposal receipt time. All questionnaires received for an offeror beyond the maximum of five will not be reviewed by the Source Selection Board.

(ii) Additionally, the Source Selection Board's tracking purposes, each Offeror shall provide with their price offer but labeled separately "Past Performance Information," the same Forms sent to past Clients with only the past Project Name and Location filled out as well as the Past Client's Name, Title and Phone Number

(iii) Offerors are required to provide Past Performance questionnaires found in the appendix and the solicitation to previous Clients for their Clients input regarding their firm's Past Performance. Offerors shall submit Past Performance questionnaires on design build projects completed within the past five (5) years, which were similar in scope, magnitude, and complexity.

(iv) Should the Offeror have no specific design build past performance, there will be an allowance made for the Offeror to demonstrate past performance on design and construction projects of similar scope, magnitude, and complexity within the past five (5) years. Offerors are required to provide Past Performance questionnaires, found in the appendix and the solicitation to previous Clients for their Client's input regarding their firm's Past Performance concerning design and construction projects.

a. The Offeror shall submit the following in support of their past performance: Design Build Performance: Offerors should demonstrate recent and relevant design build performance within the last five years for explosive facilities, research and development facilities, or vertical design projects of similar scope, magnitude and complexity. The Offeror must have at least one (1),

though not more than five (5) completed questionnaires submitted as directed.

b. Should the offeror not have sufficient design build performance within the past five (5) years, they may submit a minimum of three (3) though not to exceed five (5) completed questionnaires from clients of design and construction projects within the past five (5) years. Minimally, there must be two (2) design questionnaires and one (1) construction questionnaires submitted to the Contract Specialist. In either case, the referenced projects must either be explosive facilities, research and development facilities, or vertical build construction projects of similar scope, magnitude, and complexity to the proposed project.

c. In accordance with submittal requirements every cited example above must indicate the general scope and the firm's role in the project (prime, subcontractor, or as joint venture). Identify the firm's role in the joint venture. Provide the location, cost, extent and type of subcontracting, and date of completion of the project. Include the Offeror's assigned performance evaluation of each project (e.g., outstanding, satisfactory or unsatisfactory). Provide an explanation, if unsatisfactory. Where applicable, explain facts related to any partial or completely terminated project and disclose any job with an assessment of liquidated damages for failure in meeting completion dates. Provide references with contact names and telephone numbers.

d. The Government reserves the right to verify previous performance by reviewing the Corps of Engineers Construction contractor (or Architect/Engineer) Appraisal Support System (CCAS/ACASS) or to interview owners or references.

e. Any questionnaires received beyond the maximum requested will not be reviewed or evaluated.

Factor 4. Team Resources, Management and Personnel: The Offeror shall provide information to substantiate their qualifications. The project management system to be employed must produce a quality product on time and within budget. The Offeror must clearly identify their sub-consultants, and their responsibility on this project. Definition of Terms:

a. Project Team: (PT): The collection of staff specifically from the 8A contractor, their partner or joint venture firms as well as firms the 8A contractor has established teaming agreements with, and subcontractors specifically for the execution of this project. This would apply equally to the proposed design and construction teams.

b. Key Personnel/Key Team Member: Project Team members who have demonstrated knowledge and experience in projects similar in scope, magnitude, and complexity to the proposed design and construction teams. Regarding scope, specific concern is that design key Personnel must have demonstrated explosive safety knowledge and experience and associated qualifications.

c. Organizational Chart:

(i) There will only be one organizational chart for this project. The chart will clearly identify design, construction, and management teams for the project.

(ii) Documentation of each team, design, construction, and management, specifically identifying name, firm represented, qualifications, contact information, and discipline or area of responsibility is required.

(iii) The chart will denote the complete chain of command for the execution of the project. The organizational chart must clearly show how the design and construction teams will interact as well as how management will be involved with each team. Chart should indicate logical functional interactions.

(iv) A brief narrative, not to exceed two (2) written pages, will accompany the organizational chart, identifying the management strategy proposed to execute the project.

d. Design and Construction Personnel:

(i) The Offeror shall provide information regarding proposed personnel resources, Project Team members for this project. The Offeror shall specifically identify all proposed team members including consultants and any outside resources that the Offeror proposes to use as on this project. This would apply equally to the proposed design and construction teams.

(ii) The designation of each team, design and construction will include organizational structure of the proposed team and resumes of key personnel involved in both the design and construction of the project.

(iii) The Offeror shall provide documented experience of its Key Personnel/Key Team Members in projects of similar scope, magnitude and complexity regarding projects worked on within the past five (5) years or can demonstrate prior experience in at least one vertical construction design build project. There shall be at least two (2) Key Team Members identified for the design team and at least one (1) Key Team Member for the construction team.

(iv) The designation of Key Personnel/Key Team members shall be clearly annotated on the specific team member's resume, design and construction. These resumes shall be placed first behind the organizational chart for each team, design and construction. Resumes will be required for all members identified within the organizational chart.

Factor 5 – Contractor Quality Control: The Offeror shall submit documents in support of their intention to design and construct a quality facility and their capacity to meet project schedule.

a. Quality Control Plan:

(i) The Offeror shall submit separate Preliminary Quality Control Plans (PQCP) for both the design and construction phases. Quality Control Plan should include tasks and functions of quality control personnel, inspection procedures, method of reporting, methods for tracking deficiencies,

submittal reviews and maintenance and delivery of as-built drawings. The PQCP must demonstrate compliance with appropriate section(s) of the RFP and include:

- Authority/Task/Function: Describe the authority, assigned task, and function of all key managers personnel in the quality control organization.

- Staff Qualifications: Refer to appropriate RFP Section(s)

- Inspection Procedure

- Inspection Report

- Tracking system: Describe the procedure of tracking construction deficiencies in construction in the inspection reports.

  - Submission & Maintenance of as-built drawings.

  - Completion of Inspection: Describe plan and procedures to complete all punch lists established during the final selection.

b. Preliminary Project Scheduling:

(i) Provide a preliminary design and construction schedule using any commercially available project scheduling program showing major milestones as outlined in the solicitation. This would include project completion in no more than 730 calendar days.

(ii) Show specific milestones and phases for design and construction that portrays a thorough understanding of design and construction required for the project and which will result in a quality project.

(iii) Construction Plan: The Offeror will provide narrative addressing proposed construction methods, site security, and anticipated disruptions to traffic flow and surrounding areas.

1.1.2.2 Quality Evaluation and Rating System:

The Source Selection Evaluation Board (SSEB) will perform an in-depth review of the proposals. The SSEB will rate each evaluation factor for each proposal against the specified evaluation criteria in the SOLICITATION. Proposals shall not be compared against each other. Rating will be done by consensus. Volume 1, Technical Proposal and the five (5) factors will be rated in accordance with the guidelines. Price/Cost Proposal will not be rated but will be evaluated as regards to fairness and reasonableness.

AWARD OF CONTRACT

2.1 AWARD

The Government will award a Design-Build contract to the responsible offeror whose technical proposal has no unacceptable (red) ratings in any factor, an acceptable (green) rating in factor 1, and no more than two marginal (yellow) ratings in any other factors and whose price proposal is the lowest.

2.2 BASIS OF AWARD

The basis of award will be the Government's assessment as to which proposal receives an acceptable rating and is the lowest price. Overall technical merit will be assessed by a consideration of the color scored evaluation factors. Cost/Price will be evaluated for adequacy and reasonableness

2.3 INITIAL OFFER AND REVISED OFFER

Offerors are reminded to include their best technical and price terms in their initial offer and not automatically assume that they will have an opportunity to participate in discussions or be asked to submit a revised offer. The Government may make award of an acceptable proposal without discussions, if deemed to be within the best interests of the Government.

CLAUSES INCORPORATED BY REFERENCE

52.202-1 Alt I	Definitions (Dec 2001) --Alternate I	MAY 2001
52.203-5	Covenant Against Contingent Fees	APR 1984
52.203-6	Restrictions On Subcontractor Sales To The Government	JUL 1995
52.203-7	Anti-Kickback Procedures	JUL 1995
52.203-8	Cancellation, Rescission, and Recovery of Funds for Illegal or Improper Activity	JAN 1997
52.203-10	Price Or Fee Adjustment For Illegal Or Improper Activity	JAN 1997
52.203-12	Limitation On Payments To Influence Certain Federal Transactions	JUN 2003
52.204-2	Security Requirements	AUG 1996
52.204-4	Printed or Copied Double-Sided on Recycled Paper	AUG 2000
52.211-13	Time Extensions	SEP 2000
52.215-10	Price Reduction for Defective Cost or Pricing Data	OCT 1997
52.215-11	Price Reduction for Defective Cost or Pricing Data--Modifications	OCT 1997
52.215-12	Subcontractor Cost or Pricing Data	OCT 1997
52.215-20	Requirements for Cost or Pricing Data or Information Other Than Cost or Pricing Data	OCT 1997
52.215-21	Requirements for Cost or Pricing Data or Information Other Than Cost or Pricing Data--Modifications	OCT 1997
52.217-5	Evaluation Of Options	JUL 1990
52.219-8	Utilization of Small Business Concerns	OCT 2000
52.222-24	Preaward On-Site Equal Opportunity Compliance Evaluation	FEB 1999
52.223-3	Hazardous Material Identification And Material Safety Data	JAN 1997
52.227-14	Rights in Data--General	JUN 1987
52.228-5	Insurance - Work On A Government Installation	JAN 1997
52.232-5	Payments under Fixed-Price Construction Contracts	SEP 2002
52.232-27	Prompt Payment for Construction Contracts	OCT 2003
52.233-1	Disputes	JUL 2002
52.233-3	Protest After Award	AUG 1996
52.236-1	Performance of Work by the Contractor	APR 1984
52.236-4	Physical Data	APR 1984
52.236-5	Material and Workmanship	APR 1984
52.236-6	Superintendence by the Contractor	APR 1984
52.236-7	Permits and Responsibilities	NOV 1991
52.236-8	Other Contracts	APR 1984
52.236-9	Protection of Existing Vegetation, Structures, Equipment, Utilities, and Improvements	APR 1984
52.236-10	Operations and Storage Areas	APR 1984
52.236-11	Use and Possession Prior to Completion	APR 1984
52.236-13	Accident Prevention	NOV 1991
52.236-15	Schedules for Construction Contracts	APR 1984
52.236-16	Quantity Surveys	APR 1984
52.236-17	Layout of Work	APR 1984
52.236-21	Specifications and Drawings for Construction	FEB 1997
52.236-26	Preconstruction Conference	FEB 1995

CLAUSES INCORPORATED BY FULL TEXT

52.203-2 CERTIFICATE OF INDEPENDENT PRICE DETERMINATION (APR 1985)

(a) The offeror certifies that --

(1) The prices in this offer have been arrived at independently, without, for the purpose of restricting competition, any consultation, communication, or agreement with any other offeror or competitor relating to –

(i) Those prices,

(ii) The intention to submit an offer, or

(iii) The methods of factors used to calculate the prices offered:

(2) The prices in this offer have not been and will not be knowingly disclosed by the offeror, directly or indirectly, to any other offeror or competitor before bid opening (in the case of a sealed bid solicitation) or contract award (in the case of a negotiated solicitation) unless otherwise required by law; and

(3) No attempt has been made or will be made by the offeror to induce any other concern to submit or not to submit an offer for the purpose of restricting competition.

(b) Each signature on the offer is considered to be a certification by the signatory that the signatory --

(1) Is the person in the offeror's organization responsible for determining the prices offered in this bid or proposal, and that the signatory has not participated and will not participate in any action contrary to subparagraphs (a)(1) through (a)(3) of this provision; or

(2) (i) Has been authorized, in writing, to act as agent for the following principals in certifying that those principals have not participated, and will not participate in any action contrary to subparagraphs (a)(1) through (a)(3) of this provison _____ (insert full name of person(s) in the offeror's organization responsible for determining the prices offered in this bid or proposal, and the title of his or her position in the offeror's organization);

(ii) As an authorized agent, does certify that the principals named in subdivision (b)(2)(i) above have not participated, and will not participate, in any action contrary to subparagraphs (a)(1) through (a)(3) above; and

(iii) As an agent, has not personally participated, and will not participate, in any action contrary to subparagraphs (a)(1) through (a)(3) of this provision.

(c) If the offeror deletes or modifies subparagraph (a)(2) of this provision, the offeror must furnish with its offer a signed statement setting forth in detail the circumstances of the disclosure.

(End of clause)

52.204-3 TAXPAYER IDENTIFICATION (OCT 1998)

(a) Definitions.

"Common parent," as used in this provision, means that corporate entity that owns or controls an affiliated group of corporations that files its Federal income tax returns on a consolidated basis, and of which the offeror is a member.

"Taxpayer Identification Number (TIN)," as used in this provision, means the number required by the Internal Revenue Service (IRS) to be used by the offeror in reporting income tax and other returns. The TIN may be either a Social Security Number or an Employer Identification Number.

(b) All offerors must submit the information required in paragraphs (d) through (f) of this provision to comply with debt collection requirements of 31 U.S.C. 7701(c) and 3325(d), reporting requirements of 26 U.S.C. 6041, 6041A, and 6050M, and implementing regulations issued by the IRS. If the resulting contract is subject to the payment reporting requirements described in Federal Acquisition Regulation (FAR) 4.904, the failure or refusal by the offeror to furnish the information may result in a 31 percent reduction of payments otherwise due under the contract.

(c) The TIN may be used by the Government to collect and report on any delinquent amounts arising out of the offeror's relationship with the Government (31 U.S.C. 7701(c)(3)). If the resulting contract is subject to the payment reporting requirements described in FAR 4.904, the TIN provided hereunder may be matched with IRS records to verify the accuracy of the offeror's TIN.

(d) Taxpayer Identification Number (TIN).

___ TIN:._____

___ TIN has been applied for.

___ TIN is not required because:

___ Offeror is a nonresident alien, foreign corporation, or foreign partnership that does not have income effectively connected with the conduct of a trade or business in the United States and does not have an office or place of business or a fiscal paying agent in the United States;

___ Offeror is an agency or instrumentality of a foreign government;

___ Offeror is an agency or instrumentality of the Federal Government.

(e) Type of organization.

___ Sole proprietorship;

___ Partnership;

___ Corporate entity (not tax-exempt);

___ Corporate entity (tax-exempt);

___ Government entity (Federal, State, or local);

___ Foreign government;

___ International organization per 26 CFR 1.6049-4;

___ Other _____

(f) Common parent.

___ Offeror is not owned or controlled by a common parent as defined in paragraph (a) of this provision.

___ Name and TIN of common parent:

Name _____

TIN _____

(End of provision)

52.204-5 WOMEN-OWNED BUSINESS (OTHER THAN SMALL BUSINESS) (MAY 1999)

(a) Definition. Women-owned business concern, as used in this provision, means a concern that is at least 51 percent owned by one or more women; or in the case of any publicly owned business, at least 51 percent of its stock is owned by one or more women; and whose management and daily business operations are controlled by one or more women.

(b) Representation. [Complete only if the offeror is a women-owned business concern and has not represented itself as a small business concern in paragraph (b)(1) of FAR 52.219-1, Small Business Program Representations, of this solicitation.] The offeror represents that it ( ) is a women-owned business concern.

(End of provision)

52.209-5 CERTIFICATION REGARDING DEBARMENT, SUSPENSION, PROPOSED DEBARMENT, AND OTHER RESPONSIBILITY MATTERS (DEC 2001)

(a)(1) The Offeror certifies, to the best of its knowledge and belief, that-

(i) The Offeror and/or any of its Principals -

(A) Are ( ) are not ( ) presently debarred, suspended, proposed for debarment, or declared ineligible for the award of contracts by any Federal agency;

(B) Have ( ) have not ( ), within a three-year period preceding this offer, been convicted of or had a civil judgment rendered against them for: commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, state, or local) contract or subcontract; violation of Federal or state antitrust statutes relating to the submission of offers; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, tax evasion, or receiving stolen property; and

(C) Are ( ) are not ( ) presently indicted for, or otherwise criminally or civilly charged by a governmental entity with, commission of any of the offenses enumerated in paragraph (a)(1)(i)(B) of this provision.

(ii) The Offeror has ( ) has not ( ), within a three-year period preceding this offer, had one or more contracts terminated for default by any Federal agency.

(2) "Principals," for the purposes of this certification, means officers; directors; owners; partners; and, persons having primary management or supervisory responsibilities within a business entity (e.g., general manager; plant manager; head of a subsidiary, division, or business segment, and similar positions).

This Certification Concerns a Matter Within the Jurisdiction of an Agency of the United States and the Making of a False, Fictitious, or Fraudulent Certification May Render the Maker Subject to Prosecution Under Section 1001, Title 18, United States Code.

(b) The Offeror shall provide immediate written notice to the Contracting Officer if, at any time prior to contract award, the Offeror learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

(c) A certification that any of the items in paragraph (a) of this provision exists will not necessarily result in withholding of an award under this solicitation. However, the certification will be considered in connection with a determination of the Offeror's responsibility. Failure of the Offeror to furnish a certification or provide such additional information as requested by the Contracting Officer may render the Offeror nonresponsible.

(d) Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render, in good faith, the certification required by paragraph (a) of this provision. The knowledge and information of an Offeror is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

(e) The certification in paragraph (a) of this provision is a material representation of fact upon which reliance was placed when making award. If it is later determined that the Offeror knowingly rendered an erroneous certification, in addition to other remedies available to the Government, the Contracting Officer may terminate the contract resulting from this solicitation for default.

(End of provision)

52.211-10 COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK (APR 1984)

The Contractor shall be required to (a) commence work under this contract within 5 calendar days after the date the Contractor receives the notice to proceed, (b) prosecute the work diligently, and (c) complete the entire work ready for use not later than 730 calendar days. * The time stated for completion shall include final cleanup of the premises.

*The Contracting Officer shall specify either a number of days after the date the contractor receives the notice to proceed, or a calendar date.

(End of clause)

52.211-12 LIQUIDATED DAMAGES--CONSTRUCTION (SEP 2000)

(a) If the Contractor fails to complete the work within the time specified in the contract, the Contractor shall pay liquidated damages to the Government in the amount of $577.00 for each calendar day of delay until the work is completed or accepted.

(b) If the Government terminates the Contractor's right to proceed, liquidated damages will continue to accrue until the work is completed. These liquidated damages are in addition to excess costs of repurchase under the Termination clause.

Also see Paragraph 1.2 of Section 00800.
(End of clause)

52.215-6 PLACE OF PERFORMANCE (OCT 1997)

(a) The offeror or respondent, in the performance of any contract resulting from this solicitation, ( ) intends, ( ) does not intend (check applicable block) to use one or more plants or facilities located at a different address from the address of the offeror or respondent as indicated in this proposal or response to request for information.

(b) If the offeror or respondent checks "intends" in paragraph (a) of this provision, it shall insert in the following spaces the required information:

Place of Performance(Street Address, City, State, County, Zip Code)	**Name and Address of Owner and Operator of the Plant or Facility if Other Than Offeror or Respondent**

(End of provision)

52.219-1 SMALL BUSINESS PROGRAM REPRESENTATIONS (APR 2002)

(a)(1) The North American Industry Classification System (NAICS) code for this acquisition is 236210.

(2) The small business size standard is $28.5 million.

(3) The small business size standard for a concern which submits an offer in its own name, other than on a construction or service contract, but which proposes to furnish a product which it did not itself manufacture, is 500 employees.

(b) Representations. (1) The offeror represents as part of its offer that it ( ) is, ( ) is not a small business concern.

(2) (Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision.) The offeror represents, for general statistical purposes, that it ( ) is, ( ) is not a small disadvantaged business concern as defined in 13 CFR 124.1002.

(3) (Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision.) The offeror represents as part of its offer that it ( ) is, ( ) is not a women-owned small business concern.

(4) (Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision.) The offeror represents as part of its offer that it ( ) is, ( ) is not a veteran-owned small business concern.

(5) (Complete only if the offeror represented itself as a veteran-owned small business concern in paragraph (b)(4) of this provision.) The offeror represents as part of its offer that it ( ) is, ( ) is not a service-disabled veteran-owned small business concern.

(6) (Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision.) The offeror represents, as part of its offer, that--

(i) It ( ) is, ( ) is not a HUBZone small business concern listed, on the date of this representation, on the List of Qualified HUBZone Small Business Concerns maintained by the Small Business Administration, and no material

change in ownership and control, principal office, or HUBZone employee percentage has occurred since it was certified by the Small Business Administration in accordance with 13 CFR part 126; and

(ii) It ( ) is, ( ) is not a joint venture that complies with the requirements of 13 CFR part 126, and the representation in paragraph (b)(6)(i) of this provision is accurate for the HUBZone small business concern or concerns that are participating in the joint venture. (The offeror shall enter the name or names of the HUBZone small business concern or concerns that are participating in the joint venture:_____.) Each HUBZone small business concern participating in the joint venture shall submit a separate signed copy of the HUBZone representation.

(c) Definitions. As used in this provision--

Service-disabled veteran-owned small business concern--

(1) Means a small business concern--

(i) Not less than 51 percent of which is owned by one or more service-disabled veterans or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more service-disabled veterans; and

(ii) The management and daily business operations of which are controlled by one or more service-disabled veterans or, in the case of a veteran with permanent and severe disability, the spouse or permanent caregiver of such veteran.

(2) Service-disabled veteran means a veteran, as defined in 38 U.S.C. 101(2), with a disability that is service-connected, as defined in 38 U.S.C. 101(16).

"Small business concern," means a concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding on Government contracts, and qualified as a small business under the criteria in 13 CFR Part 121 and the size standard in paragraph (a) of this provision.

Veteran-owned small business concern means a small business concern--

(1) Not less than 51 percent of which is owned by one or more veterans (as defined at 38 U.S.C. 101(2)) or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more veterans; and

(2) The management and daily business operations of which are controlled by one or more veterans.

"Women-owned small business concern," means a small business concern --

(1) That is at least 51 percent owned by one or more women; in the case of any publicly owned business, at least 51 percent of the stock of which is owned by one or more women; and

(2) Whose management and daily business operations are controlled by one or more women.

(d) Notice.

(1) If this solicitation is for supplies and has been set aside, in whole or in part, for small business concerns, then the clause in this solicitation providing notice of the set-aside contains restrictions on the source of the end items to be furnished.

(2) Under 15 U.S.C. 645(d), any person who misrepresents a firm's status as a small, HUBZone small, small disadvantaged, or women-owned small business concern in order to obtain a contract to be awarded under the

preference programs established pursuant to section 8(a), 8(d), 9, or 15 of the Small Business Act or any other provision of Federal law that specifically references section 8(d) for a definition of program eligibility, shall--

(i) Be punished by imposition of fine, imprisonment, or both;

(ii) Be subject to administrative remedies, including suspension and debarment; and

(iii) Be ineligible for participation in programs conducted under the authority of the Act.

(End of provision)

52.219-2 EQUAL LOW BIDS. (OCT 1995)

(a) This provision applies to small business concerns only.

(b) The bidder's status as a labor surplus area (LSA) concern may affect entitlement to award in case of tie bids. If the bidder wishes to be considered for this priority, the bidder must identify, in the following space, the LSA in which the costs to be incurred on account of manufacturing or production (by the bidder or the first-tier subcontractors) amount to more than 50 percent of the contract price.

_____

_____

(c) Failure to identify the labor surplus area as specified in paragraph (b) of this provision will preclude the bidder from receiving priority consideration. If the bidder is awarded a contract as a result of receiving priority consideration under this provision and would not have otherwise received award, the bidder shall perform the contract or cause the contract to be performed in accordance with the obligations of an LSA concern.

52.228-1 BID GUARANTEE (SEP 1996)

(a) Failure to furnish a bid guarantee in the proper form and amount, by the time set for opening of bids, may be cause for rejection of the bid.

(b) The bidder shall furnish a bid guarantee in the form of a firm commitment, e.g., bid bond supported by good and sufficient surety or sureties acceptable to the Government, postal money order, certified check, cashier's check, irrevocable letter of credit, or, under Treasury Department regulations, certain bonds or notes of the United States. The Contracting Officer will return bid guarantees, other than bid bonds, (1) to unsuccessful bidders as soon as practicable after the opening of bids, and (2) to the successful bidder upon execution of contractual documents and bonds (including any necessary coinsurance or reinsurance agreements), as required by the bid as accepted.-

(c) The amount of the bid guarantee shall be **20** percent of the bid price or $3,000,000, whichever is less.-

(d) If the successful bidder, upon acceptance of its bid by the Government within the period specified for acceptance, fails to execute all contractual documents or furnish executed bond(s) within 10 days after receipt of the forms by the bidder, the Contracting Officer may terminate the contract for default.-

(e) In the event the contract is terminated for default, the bidder is liable for any cost of acquiring the work that exceeds the amount of its bid, and the bid guarantee is available to offset the difference.

(End of clause)

52.230-1 COST ACCOUNTING STANDARDS NOTICES AND CERTIFICATION (JUN 2000)

Note: This notice does not apply to small businesses or foreign governments. This notice is in three parts, identified by Roman numerals I through III.

Offerors shall examine each part and provide the requested information in order to determine Cost Accounting Standards (CAS) requirements applicable to any resultant contract.

If the offeror is an educational institution, Part II does not apply unless the contemplated contract will be subject to full or modified CAS coverage pursuant to 48 CFR 9903.201-2(c)(5) or 9903.201-2(c)(6), respectively.

I. DISCLOSURE STATEMENT--COST ACCOUNTING PRACTICES AND CERTIFICATION

(a) Any contract in excess of $500,000 resulting from this solicitation will be subject to the requirements of the Cost Accounting Standards Board (48 CFR Chapter 99), except for those contracts which are exempt as specified in 48 CFR 9903.201-1.

(b) Any offeror submitting a proposal which, if accepted, will result in a contract subject to the requirements of 48 CFR Chapter 99 must, as a condition of contracting, submit a Disclosure Statement as required by 48 CFR 9903.202. When required, the Disclosure Statement must be submitted as a part of the offeror's proposal under this solicitation unless the offeror has already submitted a Disclosure Statement disclosing the practices used in connection with the pricing of this proposal. If an applicable Disclosure Statement has already been submitted, the offeror may satisfy the requirement for submission by providing the information requested in paragraph (c) of Part I of this provision.

CAUTION: In the absence of specific regulations or agreement, a practice disclosed in a Disclosure Statement shall not, by virtue of such disclosure, be deemed to be a proper, approved, or agreed-to practice for pricing proposals or accumulating and reporting contract performance cost data.

(c) Check the appropriate box below:

(1) Certificate of Concurrent Submission of Disclosure Statement.

The offeror hereby certifies that, as a part of the offer, copies of the Disclosure Statement have been submitted as follows: (i) original and one copy to the cognizant Administrative Contracting Officer (ACO) or cognizant Federal agency official authorized to act in that capacity (Federal official), as applicable, and (ii) one copy to the cognizant Federal auditor.

(Disclosure must be on Form No. CASB DS-1 or CASB DS-2, as applicable. Forms may be obtained from the cognizant ACO or Federal official and/or from the loose-leaf version of the Federal Acquisition Regulation.)

Date of Disclosure Statement: _____ Name and Address of Cognizant ACO or Federal Official Where Filed: _____

The offeror further certifies that the practices used in estimating costs in pricing this proposal are consistent with the cost accounting practices disclosed in the Disclosure Statement.

(2) Certificate of Previously Submitted Disclosure Statement.

The offeror hereby certifies that the required Disclosure Statement was filed as follows:

Date of Disclosure Statement: _____ Name and Address of Cognizant ACO or Federal Official Where Filed: _____

The offeror further certifies that the practices used in estimating costs in pricing this proposal are consistent with the cost accounting practices disclosed in the applicable Disclosure Statement.

(3) Certificate of Monetary Exemption.

The offeror hereby certifies that the offeror, together with all divisions, subsidiaries, and affiliates under common control, did not receive net awards of negotiated prime contracts and subcontracts subject to CAS totaling more than $50 million (of which at least one award exceeded $1 million) in the cost accounting period immediately preceding the period in which this proposal was submitted. The offeror further certifies that if such status changes before an award resulting from this proposal, the offeror will advise the Contracting Officer immediately.

(4) Certificate of Interim Exemption.

The offeror hereby certifies that (i) the offeror first exceeded the monetary exemption for disclosure, as defined in (3) of this subsection, in the cost accounting period immediately preceding the period in which this offer was submitted and (ii) in accordance with 48 CFR 9903.202-1, the offeror is not yet required to submit a Disclosure Statement. The offeror further certifies that if an award resulting from this proposal has not been made within 90 days after the end of that period, the offeror will immediately submit a revised certificate to the Contracting Officer, in the form specified under subparagraph (c)(1) or (c)(2) of Part I of this provision, as appropriate, to verify submission of a completed Disclosure Statement.

CAUTION: Offerors currently required to disclose because they were awarded a CAS-covered prime contract or subcontract of $50 million or more in the current cost accounting period may not claim this exemption (4). Further, the exemption applies only in connection with proposals submitted before expiration of the 90-day period following the cost accounting period in which the monetary exemption was exceeded.

II. COST ACCOUNTING STANDARDS--ELIGIBILITY FOR MODIFIED CONTRACT COVERAGE

If the offeror is eligible to use the modified provisions of 48 CFR 9903.201-2(b) and elects to do so, the offeror shall indicate by checking the box below. Checking the box below shall mean that the resultant contract is subject to the Disclosure and Consistency of Cost Accounting Practices clause in lieu of the Cost Accounting Standards clause.

( ) The offeror hereby claims an exemption from the Cost Accounting Standards clause under the provisions of 48 CFR 9903.201-2(b) and certifies that the offeror is eligible for use of the Disclosure and Consistency of Cost Accounting Practices clause because during the cost accounting period immediately preceding the period in which this proposal was submitted, the offeror received less than $50 million in awards of CAS-covered prime contracts and subcontracts. The offeror further certifies that if such status changes before an award resulting from this proposal, the offeror will advise the Contracting Officer immediately.

CAUTION: An offeror may not claim the above eligibility for modified contract coverage if this proposal is expected to result in the award of a CAS-covered contract of $50 million or more or if, during its current cost accounting period, the offeror has been awarded a single CAS-covered prime contract or subcontract of $25 million or more.

III. ADDITIONAL COST ACCOUNTING STANDARDS APPLICABLE TO EXISTING CONTRACTS

The offeror shall indicate below whether award of the contemplated contract would, in accordance with subparagraph (a)(3) of the Cost Accounting Standards clause, require a change in established cost accounting practices affecting existing contracts and subcontracts.

( ) YES ( ) NO

(End of clause)

ADDITIONAL INFORMATION

THE NEXT SECTION CONTAINS SECTION 00700, ENTITLED "CONTRACT CLAUSES." SOME CLAUSES MIGHT HAVE ADDITIONAL INFORMATION OR EXPANSION; THEREFORE, OFFERORS SHOULD ALSO REFER TO SECTION 00800, ENTITLED "SPECIAL CONTRACT REQUIREMENTS OF TECHNICAL SPECIFICATIONS."

Section 00700 - Contract Clauses

CLAUSES INCORPORATED BY REFERENCE

52.219-4	Notice of Price Evaluation Preference for HUBZone Small Business Concerns	JAN 1999
52.222-22	Previous Contracts And Compliance Reports	FEB 1999
52.242-13	Bankruptcy	JUL 1995
52.242-14	Suspension of Work	APR 1984
52.243-4	Changes	AUG 1987
52.244-6	Subcontracts for Commercial Items	APR 2003
52.245-3	Identification of Government-Furnished Property	APR 1984
52.246-12	Inspection of Construction	AUG 1996
52.246-21	Warranty of Construction	MAR 1994
52.247-34	F.O.B. Destination	NOV 1991
52.249-2 Alt I	Termination for Convenience of the Government (Fixed-Price) (Sep 1996) - Alternate I	SEP 1996
52.249-10	Default (Fixed-Price Construction)	APR 1984
52.253-1	Computer Generated Forms	JAN 1991
252.203-7001	Prohibition On Persons Convicted of Fraud or Other Defense-Contract-Related Felonies	MAR 1999
252.204-7003	Control Of Government Personnel Work Product	APR 1992
252.205-7000	Provision Of Information To Cooperative Agreement Holders	DEC 1991
252.209-7000	Acquisition From Subcontractors Subject To On-Site Inspection Under The Intermediate Range Nuclear Forces (INF) Treaty	NOV 1995
252.209-7004	Subcontracting With Firms That Are Owned or Controlled By The Government of a Terrorist Country	MAR 1998
252.215-7000	Pricing Adjustments	DEC 1991
252.219-7003	Small, Small Disadvantaged and Women-Owned Small Business Subcontracting Plan (DOD Contracts)	APR 1996
252.219-7009	Section 8(a) Direct Award	MAR 2002
252.225-7012	Preference For Certain Domestic Commodities	FEB 2003
252.225-7031	Secondary Arab Boycott Of Israel	APR 2003
252.227-7022	Government Rights (Unlimited)	MAR 1979
252.227-7023	Drawings and Other Data to become Property of Government	MAR 1979
252.236-7000	Modification Proposals-Price Breakdown	DEC 1991
252.236-7001	Contract Drawings, Maps, and Specifications	AUG 2000
252.236-7008	Contract Prices-Bidding Schedules	DEC 1991
252.243-7002	Requests for Equitable Adjustment	MAR 1998
252.244-7000	Subcontracts for Commercial Items and Commercial Components (DoD Contracts)	MAR 2000

CLAUSES INCORPORATED BY FULL TEXT

52.204-1 APPROVAL OF CONTRACT (DEC 1989)

This contract is subject to the written approval of the Contracting Officer and shall not be binding until so approved.

(End of clause)

52.216-1 TYPE OF CONTRACT (APR 1984)

The Government contemplates award of a **Firm-Fixed Contract** contract resulting from this solicitation.

(End of clause)

52.217-5 EVALUATION OF OPTIONS (JUL 1990)

Except when it is determined in accordance with FAR 17.206(b) not to be in the Government's best interests, the Government will evaluate offers for award purposes by adding the total price for all options to the total price for the basic requirement. Evaluation of options will not obligate the Government to exercise the option(s).

(End of provision)

52.222-23 NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY FOR CONSTRUCTION (FEB 1999)

(a) The offeror's attention is called to the Equal Opportunity clause and the Affirmative Action Compliance Requirements for Construction clause of this solicitation.

(b) The goals for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

Goals for minority participation for each trade	Goals for female participation for each trade
17.3%	6.9%

These goals are applicable to all the Contractor's construction work performed in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, the Contractor shall apply the goals established for the geographical area where the work is actually performed. Goals are published periodically in the Federal Register in notice form, and these notices may be obtained from any Office of Federal Contract Compliance Programs office.

(c) The Contractor's compliance with Executive Order 11246, as amended, and the regulations in 41 CFR 60-4 shall be based on (1) its implementation of the Equal Opportunity clause, (2) specific affirmative action obligations required by the clause entitled "Affirmative Action Compliance Requirements for Construction," and (3) its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade. The Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor, or from project to project, for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, Executive Order 11246, as amended, and the regulations in 41 CFR 60-4. Compliance with the goals will be measured against the total work hours performed.

(d) The Contractor shall provide written notification to the Deputy Assistant Secretary for Federal Contract Compliance, U.S. Department of Labor, within 10 working days following award of any construction subcontract in excess of $10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the --

(1) Name, address, and telephone number of the subcontractor;

(2) Employer's identification number of the subcontractor;

(3) Estimated dollar amount of the subcontract;

(4) Estimated starting and completion dates of the subcontract; and

(5) Geographical area in which the subcontract is to be performed.

(e) As used in this Notice, and in any contract resulting from this solicitation, the "covered area" is [Contracting Officer shall insert description of the geographical areas where the contract is to be performed, giving the State, county, and city].

(End of provision)

52.222-26 EQUAL OPPORTUNITY (APR 2002)

(a) Definition. United States, as used in this clause, means the 50 States, the District of Columbia, Puerto Rico, the Northern Mariana Islands, American Samoa, Guam, the U.S. Virgin Islands, and Wake Island.

(b) If, during any 12-month period (including the 12 months preceding the award of this contract), the Contractor has been or is awarded nonexempt Federal contracts and/or subcontracts that have an aggregate value in excess of $10,000, the Contractor shall comply with paragraphs (b)(1) through (b)(11) of this clause, except for work performed outside the United States by employees who were not recruited within the United States. Upon request, the Contractor shall provide information necessary to determine the applicability of this clause.

(1) The Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. However, it shall not be a violation of this clause for the Contractor to extend a publicly announced preference in employment to Indians living on or near an Indian reservation, in connection with employment opportunities on or near an Indian reservation, as permitted by 41 CFR 60-1.5.

(2) The Contractor shall take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, or national origin. This shall include, but not be limited to, (i) employment, (ii) upgrading, (iii) demotion, (iv) transfer, (v) recruitment or recruitment advertising, (vi) layoff or termination, (vii) rates of pay or other forms of compensation, and (viii) selection for training, including apprenticeship.

(3) The Contractor shall post in conspicuous places available to employees and applicants for employment the notices to be provided by the Contracting Officer that explain this clause.

(4) The Contractor shall, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, or national origin.

(5) The Contractor shall send, to each labor union or representative of workers with which it has a collective

bargaining agreement or other contract or understanding, the notice to be provided by the Contracting Officer advising the labor union or workers' representative of the Contractor's commitments under this clause, and post copies of the notice in conspicuous places available to employees and applicants for employment.

(6) The Contractor shall comply with Executive Order 11246, as amended, and the rules, regulations, and orders of the Secretary of Labor.

(7) The Contractor shall furnish to the contracting agency all information required by Executive Order 11246, as amended, and by the rules, regulations, and orders of the Secretary of Labor. The Contractor shall also file Standard Form 100 (EEO-1), or any successor form, as prescribed in 41 CFR part 60-1. Unless the Contractor has filed within the 12 months preceding the date of contract award, the Contractor shall, within 30 days after contract award, apply to either the regional Office of Federal Contract Compliance Programs (OFCCP) or the local office of the Equal Employment Opportunity Commission for the necessary forms.

(8) The Contractor shall permit access to its premises, during normal business hours, by the contracting agency or the OFCCP for the purpose of conducting on-site compliance evaluations and complaint investigations. The Contractor shall permit the Government to inspect and copy any books, accounts, records (including computerized records), and other material that may be relevant to the matter under investigation and pertinent to compliance with Executive Order 11246, as amended, and rules and regulations that implement the Executive Order.

(9) If the OFCCP determines that the Contractor is not in compliance with this clause or any rule, regulation, or order of the Secretary of Labor, this contract may be canceled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts, under the procedures authorized in Executive Order 11246, as amended. In addition, sanctions may be imposed and remedies invoked against the Contractor as provided in Executive Order 11246, as amended; in the rules, regulations, and orders of the Secretary of Labor; or as otherwise provided by law.

(10) The Contractor shall include the terms and conditions of subparagraphs (b)(1) through (11) of this clause in every subcontract or purchase order that is not exempted by the rules, regulations, or orders of the Secretary of Labor issued under Executive Order 11246, as amended, so that these terms and conditions will be binding upon each subcontractor or vendor.

(11) The Contractor shall take such action with respect to any subcontract or purchase order as the contracting officer may direct as a means of enforcing these terms and conditions, including sanctions for noncompliance; provided, that if the Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of any direction, the Contractor may request the United States to enter into the litigation to protect the interests of the United States.

(c) Notwithstanding any other clause in this contract, disputes relative to this clause will be governed by the procedures in 41 CFR 60-1.1.

(End of clause)

52.228-15 PERFORMANCE AND PAYMENT BONDS--CONSTRUCTION (JUL 2000)-

(a) Definitions. As used in this clause--

Original contract price means the award price of the contract; or, for requirements contracts, the price payable for the estimated total quantity; or, for indefinite-quantity contracts, the price payable for the specified minimum quantity. Original contract price does not include the price of any options, except those options exercised at the time of contract award.

(b) Amount of required bonds. Unless the resulting contract price is $100,000 or less, the successful offeror shall furnish performance and payment bonds to the Contracting Officer as follows:

(1) Performance bonds (Standard Form 25). The penal amount of performance bonds at the time of contract award shall be 100 percent of the original contract price.

(2) Payment Bonds (Standard Form 25-A). The penal amount of payment bonds at the time of contract award shall be 100 percent of the original contract price.

(3) Additional bond protection. (i) The Government may require additional performance and payment bond protection if the contract price is increased. The increase in protection generally will equal 100 percent of the increase in contract price.

(ii) The Government may secure the additional protection by directing the Contractor to increase the penal amount of the existing bond or to obtain an additional bond.

(c) Furnishing executed bonds. The Contractor shall furnish all executed bonds, including any necessary reinsurance agreements, to the Contracting Officer, within the time period specified in the Bid Guarantee provision of the solicitation, or otherwise specified by the Contracting Officer, but in any event, before starting work.

(d) Surety or other security for bonds. The bonds shall be in the form of firm commitment, supported by corporate sureties whose names appear on the list contained in Treasury Department Circular 570, individual sureties, or by other acceptable security such as postal money order, certified check, cashier's check, irrevocable letter of credit, or, in accordance with Treasury Department regulations, certain bonds or notes of the United States. Treasury Circular 570 is published in the Federal Register or may be obtained from the U.S. Department of Treasury, Financial Management Service, Surety Bond Branch, 401 14th Street, NW, 2nd Floor, West Wing, Washington, DC 20227.

(e) Notice of subcontractor waiver of protection (40 U.S.C. 270b(c). Any waiver of the right to sue on the payment bond is void unless it is in writing, signed by the person whose right is waived, and executed after such person has first furnished labor or material for use in the performance of the contract.

(End of clause)

52.231-5000 EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE
MAR 1995)--EFARS

(a) This clause does not apply to terminations. See 52.249-5000, Basis for Settlement of Proposals and FAR Part 49.

(b) Allowable cost for construction and marine plant and equipment in sound workable condition owned or controlled and furnished by a contractor or subcontractor at any tier shall be based on actual cost data for each piece of equipment or groups of similar serial and series for which the Government can determine both ownership and operating costs from the contractor's accounting records. When both ownership and operating costs cannot be determined for any piece of equipment or groups of similar serial or series equipment from the contractor's accounting records, costs for that equipment shall be based upon the applicable provisions of EP 1110-1-8, Construction Equipment Ownership and Operating Expense Schedule, Region 1 Working conditions shall be considered to be average for determining equipment rates using the schedule unless specified otherwise by the contracting officer. For equipment not included in the schedule, rates for comparable pieces of equipment may be used or a rate

may be developed using the formula provided in the schedule. For forward pricing, the schedule in effect at the time of negotiations shall apply. For retroactive pricing, the schedule in effect at the time the work was performed shall apply.

(c) Equipment rental costs are allowable, subject to the provisions of FAR 31.105(d)(ii) and FAR 31.205-36. Rates for equipment rented from an organization under common control, lease-purchase arrangements, and sale-leaseback arrangements, will be determined using the schedule, except that actual rates will be used for equipment leased from an organization under common control that has an established practice of leasing the same or similar equipment to unaffiliated lessees.

(d) When actual equipment costs are proposed and the total amount of the pricing action exceeds the small purchase threshold, the contracting officer shall request the contractor to submit either certified cost or pricing data, or partial/limited data, as appropriate. The data shall be submitted on Standard Form 1411, Contract Pricing Proposal Cover Sheet.

(End of clause)

52.232-16 PROGRESS PAYMENTS (APR 2003)

The Government will make progress payments to the Contractor when requested as work progresses, but not more frequently than monthly, in amounts of $2,500 or more approved by the Contracting Officer, under the following conditions:

(a) Computation of amounts. (1) Unless the Contractor requests a smaller amount, the Government will compute each progress payment as 80 percent of the Contractor's total costs incurred under this contract whether or not actually paid, plus financing payments to subcontractors (see paragraph (j) of this clause), less the sum of all previous progress payments made by the Government under this contract. The Contracting Officer will consider cost of money that would be allowable under FAR 31.205-10 as an incurred cost for progress payment purposes.

(2) The amount of financing and other payments for supplies and services purchased directly for the contract are limited to the amounts that have been paid by cash, check, or other forms of payment, or that are determined due and will be paid to subcontractors--

(i) In accordance with the terms and conditions of a subcontract or invoice; and

(ii) Ordinarily within 30 days of the submission of the Contractor's payment request to the Government.

(3) The Government will exclude accrued costs of Contractor contributions under employee pension plans until actually paid unless--

(i) The Contractor's practice is to make contributions to the retirement fund quarterly or more frequently; and

(ii) The contribution does not remain unpaid 30 days after the end of the applicable quarter or shorter payment period (any contribution remaining unpaid shall be excluded from the Contractor's total costs for progress payments until paid).

(4) The Contractor shall not include the following in total costs for progress payment purposes in paragraph (a)(1) of this clause:

(i) Costs that are not reasonable, allocable to this contract, and consistent with sound and generally accepted accounting principles and practices.

(ii) Costs incurred by subcontractors or suppliers.

(iii) Costs ordinarily capitalized and subject to depreciation or amortization except for the properly depreciated or amortized portion of such costs.

(iv) Payments made or amounts payable to subcontractors or suppliers, except for --

(A) completed work, including partial deliveries, to which the Contractor has acquired title; and

(B) Work under cost-reimbursement or time-and-material subcontracts to which the Contractor has acquired title.

(5) The amount of unliquidated progress payments may exceed neither (i) the progress payments made against incomplete work (including allowable unliquidated progress payments to subcontractors) nor

(ii) the value, for progress payment purposes, of the incomplete work. Incomplete work shall be considered to be the supplies and services required by this contract, for which delivery and invoicing by the Contractor and acceptance by the Government are incomplete.

(6) The total amount of progress payments shall not exceed 80 percent of the total contract price.

(7) If a progress payment or the unliquidated progress payments exceed the amounts permitted by subparagraphs (a)(4) or (a)(5) above, the Contractor shall repay the amount of such excess to the Government on demand.

(8) Notwithstanding any other terms of the contract, the Contractor agrees not to request progress payments in dollar amounts of less than $2,500. The Contracting Officer may make exceptions.

(b) Liquidation. Except as provided in the Termination for Convenience of the Government clause, all progress payments shall be liquidated by deducting from any payment under this contract, other than advance or progress payments, the unliquidated progress payments, or 80 percent of the amount invoiced, whichever is less. The Contractor shall repay to the Government any amounts required by a retroactive price reduction, after computing liquidations and payments on past invoices at the reduced prices and adjusting the unliquidated progress payments accordingly. The Government reserves the right to unilaterally change from the ordinary liquidation rate to an alternate rate when deemed appropriate for proper contract financing.

(c) Reduction or suspension. The Contracting Officer may reduce or suspend progress payments, increase the rate of liquidation, or take a combination of these actions, after finding on substantial evidence any of the following conditions:

(1) The Contractor failed to comply with any material requirement of this contract (which includes paragraphs (f) and (g) below).

(2) Performance of this contract is endangered by the Contractor's

(i) failure to make progress or

(ii) unsatisfactory financial condition.

(3) Inventory allocated to this contract substantially exceeds reasonable requirements.

(4) The Contractor is delinquent in payment of the costs of performing this contract in the ordinary course of

business.

(5) The unliquidated progress payments exceed the fair value of the work accomplished on the undelivered portion of this contract.

(6) The Contractor is realizing less profit than that reflected in the establishment of any alternate liquidation rate in paragraph (b) above, and that rate is less than the progress payment rate stated in subparagraph (a)(1) above.

(d) Title.

(1) Title to the property described in this paragraph (d) shall vest in the Government. Vestiture shall be immediately upon the date of this contract, for property acquired or produced before that date. Otherwise, vestiture shall occur when the property is or should have been allocable or properly chargeable to this contract.

(2) "Property," as used in this clause, includes all of the below-described items acquired or produced by the Contractor that are or should be allocable or properly chargeable to this contract under sound and generally accepted accounting principles and practices.

(i) Parts, materials, inventories, and work in process;

(ii) Special tooling and special test equipment to which the Government is to acquire title under any other clause of this contract;

(iii) Nondurable (i.e., noncapital) tools, jigs, dies, fixtures, molds, patterns, taps, gauges, test equipment, and other similar manufacturing aids, title to which would not be obtained as special tooling under subparagraph (ii) above; and

(iv) Drawings and technical data, to the extent the Contractor or subcontractors are required to deliver them to the Government by other clauses of this contract.

(3) Although title to property is in the Government under this clause, other applicable clauses of this contract; e.g., the termination or special tooling clauses, shall determine the handling and disposition of the property.

(4) The Contractor may sell any scrap resulting from production under this contract without requesting the Contracting Officer's approval, but the proceeds shall be credited against the costs of performance.

(5) To acquire for its own use or dispose of property to which title is vested in the Government under this clause, the Contractor must obtain the Contracting Officer's advance approval of the action and the terms. The Contractor shall (i) exclude the allocable costs of the property from the costs of contract performance, and (ii) repay to the Government any amount of unliquidated progress payments allocable to the property. Repayment may be by cash or credit memorandum.

(6) When the Contractor completes all of the obligations under this contract, including liquidation of all progress payments, title shall vest in the Contractor for all property (or the proceeds thereof) not--

(i) Delivered to, and accepted by, the Government under this contract; or

(ii) Incorporated in supplies delivered to, and accepted by, the Government under this contract and to which title is vested in the Government under this clause.

(7) The terms of this contract concerning liability for Government-furnished property shall not apply to property to which the Government acquired title solely under this clause.

(e) Risk of loss. Before delivery to and acceptance by the Government, the Contractor shall bear the risk of loss for

property, the title to which vests in the Government under this clause, except to the extent the Government expressly assumes the risk. The Contractor shall repay the Government an amount equal to the unliquidated progress payments that are based on costs allocable to property that is damaged, lost, stolen, or destroyed.

(f) Control of costs and property. The Contractor shall maintain an accounting system and controls adequate for the proper administration of this clause.

(g) Reports and access to records. The Contractor shall promptly furnish reports, certificates, financial statements, and other pertinent information reasonably requested by the Contracting Officer for the administration of this clause. Also, the Contractor shall give the Government reasonable opportunity to examine and verify the Contractor's books, records, and accounts.

(h) Special terms regarding default. If this contract is terminated under the Default clause, (i) the Contractor shall, on demand, repay to the Government the amount of unliquidated progress payments and (ii) title shall vest in the Contractor, on full liquidation of progress payments, for all property for which the Government elects not to require delivery under the Default clause. The Government shall be liable for no payment except as provided by the Default clause.

(i) Reservations of rights. (1) No payment or vesting of title under this clause shall (i) excuse the Contractor from performance of obligations under this contract or (ii) constitute a waiver of any of the rights or remedies of the parties under the contract.

(2) The Government's rights and remedies under this clause

(i) Shall not be exclusive but rather shall be in addition to any other rights and remedies provided by law or this contract and

(ii) Shall not be affected by delayed, partial, or omitted exercise of any right, remedy, power, or privilege, nor shall such exercise or any single exercise preclude or impair any further exercise under this clause or the exercise of any other right, power, or privilege of the Government.

(j) Financing payments to subcontractors. The financing payments to subcontractors mentioned in paragraphs (a)(1) and (a)(2) of this clause shall be all financing payments to subcontractors or divisions, if the following conditions are met:

(1) The amounts included are limited to--

(i) The unliquidated remainder of financing payments made; plus

(ii) Any unpaid subcontractor requests for financing payments.

(2) The subcontract or interdivisional order is expected to involve a minimum of approximately 6 months between the beginning of work and the first delivery; or, if the subcontractor is a small business concern, 4 months.

(3) If the financing payments are in the form of progress payments, the terms of the subcontract or interdivisional order concerning progress payments--

(i) Are substantially similar to the terms of this clause for any subcontractor that is a large business concern, or this clause with its Alternate I for any subcontractor that is a small business concern;

(ii) Are at least as favorable to the Government as the terms of this clause;

(iii) Are not more favorable to the subcontractor or division than the terms of this clause are to the Contractor;

(iv) Are in conformance with the requirements of FAR 32.504(e); and

(v) Subordinate all subcontractor rights concerning property to which the Government has title under the subcontract to the Government's right to require delivery of the property to the Government if--

(A) The Contractor defaults; or

(B) The subcontractor becomes bankrupt or insolvent.

(4) If the financing payments are in the form of performance-based payments, the terms of the subcontract or interdivisional order concerning payments--

(i) Are substantially similar to the Performance-Based Payments clause at FAR 52.232-32 and meet the criteria for, and definition of, performance-based payments in FAR Part 32;

(ii) Are in conformance with the requirements of FAR 32.504(f); and

(iii) Subordinate all subcontractor rights concerning property to which the Government has title under the subcontract to the Government's right to require delivery of the property to the Government if--

(A) The Contractor defaults; or

(B) The subcontractor becomes bankrupt or insolvent.

(5) If the financing payments are in the form of commercial item financing payments, the terms of the subcontract or interdivisional order concerning payments--

(i) Are constructed in accordance with FAR 32.206(c) and included in a subcontract for a commercial item purchase that meets the definition and standards for acquisition of commercial items in FAR Parts 2 and 12;

(ii) Are in conformance with the requirements of FAR 32.504(g); and

(iii) Subordinate all subcontractor rights concerning property to which the Government has title under the subcontract to the Government's right to require delivery of the property to the Government if--

(A) The Contractor defaults; or

(B) The subcontractor becomes bankrupt or insolvent.

(6) If financing is in the form of progress payments, the progress payment rate in the subcontract is the customary rate used by the contracting agency, depending on whether the subcontractor is or is not a small business concern.

(7) Concerning any proceeds received by the Government for property to which title has vested in the Government under the subcontract terms, the parties agree that the proceeds shall be applied to reducing any unliquidated financing payments by the Government to the Contractor under this contract.

(8) If no unliquidated financing payments to the Contractor remain, but there are unliquidated financing payments that the Contractor has made to any subcontractor, the Contractor shall be subrogated to all the rights the Government obtained through the terms required by this clause to be in any subcontract, as if all such rights had been assigned and transferred to the Contractor.

(9) To facilitate small business participation in subcontracting under this contract, the Contractor shall provide

financing payments to small business concerns, in conformity with the standards for customary contract financing payments stated in Subpart 32.113. The Contractor shall not consider the need for such financing payments as a handicap or adverse factor in the award of subcontracts.

(k) Limitations on undefinitized contract actions. Notwithstanding any other progress payment provisions in this contract, progress payments may not exceed 80 percent of costs incurred on work accomplished under undefinitized contract actions. A "contract action" is any action resulting in a contract, as defined in Subpart 2.1, including contract modifications for additional supplies or services, but not including contract modifications that are within the scope and under the terms of the contract, such as contract modifications issued pursuant to the Changes clause, or funding and other administrative changes. This limitation shall apply to the costs incurred, as computed in accordance with paragraph (a) of this clause, and shall remain in effect until the contract action is definitized. Costs incurred which are subject to this limitation shall be segregated on Contractor progress payment requests and invoices from those costs eligible for higher progress payment rates. For purposes of progress payment liquidation, as described in paragraph (b) of this clause, progress payments for undefinitized contract actions shall be liquidated at 80 percent of the amount invoiced for work performed under the undefinitized contract action as long as the contract action remains undefinitized. The amount of unliquidated progress payments for undefinitized contract actions shall not exceed 80 percent of the maximum liability of the Government under the undefinitized contract action or such lower limit specified elsewhere in the contract. Separate limits may be specified for separate actions.

(l) Due date. The designated payment office will make progress payments on the _____ (Contracting Officer insert date as prescribed by agency head; if not prescribed, insert “30th”) day after the designated billing office receives a proper progress payment request. In the event that the Government requires an audit or other review of a specific progress payment request to ensure compliance with the terms and conditions of the contract, the designated payment office is not compelled to make payment by the specified due date. Progress payments are considered contract financing and are not subject to the interest penalty provisions of the Prompt Payment Act.

(m) Progress payments under indefinite--delivery contracts. The Contractor shall account for and submit progress payment requests under individual orders as if the order constituted a separate contract, unless otherwise specified in this contract.

(End of clause)

52.236-2 DIFFERING SITE CONDITIONS (APR 1984)

As prescribed in 36.502, insert the following clause in solicitations and contracts when a fixed-price construction contract or a fixed-price dismantling, demolition, or removal of improvements contract is contemplated and the contract amount is expected to exceed the small purchase limitation. The Contracting Officer may insert the clause in solicitations and contracts when a fixed-price construction or a fixed-price contract for dismantling, demolition, or removal of improvements is contemplated and the contract amount is expected to be within the small purchase limitation.

(a) The Contractor shall promptly, and before the conditions are disturbed, give a written notice to the Contracting Officer of

(1) subsurface or latent physical conditions at the site which differ materially from those indicated in this contract, or

(2) unknown physical conditions at the site, of an unusual nature, which differ materially from those ordinarily encountered and generally recognized as inhering in work of the character provided for in the contract.

(b) The Contracting Officer shall investigate the site conditions promptly after receiving the notice. If the conditions

do materially so differ and cause an increase or decrease in the Contractor's cost of, or the time required for, performing any part of the work under this contract, whether or not changed as a result of the conditions, an equitable adjustment shall be made under this clause and the contract modified in writing accordingly.

(c) No request by the Contractor for an equitable adjustment to the contract under this clause shall be allowed, unless the Contractor has given the written notice required; provided, that the time prescribed in (a) above for giving written notice may be extended by the Contracting Officer.

(d) No request by the Contractor for an equitable adjustment to the contract for differing site conditions shall be allowed if made after final payment under this contract.

(End of clause)

52.236-3 SITE INVESTIGATION AND CONDITIONS AFFECTING THE WORK (APR 1984)

(a) The Contractor acknowledges that it has taken steps reasonably necessary to ascertain the nature and location of the work, and that it has investigated and satisfied itself as to the general and local conditions which can affect the work or its cost, including but not limited to

(1) conditions bearing upon transportation, disposal, handling, and storage of materials;

(2) the availability of labor, water, electric power, and roads;

(3) uncertainties of weather, river stages, tides, or similar physical conditions at the site;

(4) the conformation and conditions of the ground; and (5) the character of equipment and facilities needed preliminary to and during work performance. The Contractor also acknowledges that it has satisfied itself as to the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, including all exploratory work done by the Government, as well as from the drawings and specifications made a part of this contract. Any failure of the Contractor to take the actions described and acknowledged in this paragraph will not relieve the Contractor from responsibility for estimating properly the difficulty and cost of successfully performing the work, or for proceeding to successfully perform the work without additional expense to the Government.

(b) The Government assumes no responsibility for any conclusions or interpretations made by the Contractor based on the information made available by the Government. Nor does the Government assume responsibility for any understanding reached or representation made concerning conditions which can affect the work by any of its officers or agents before the execution of this contract, unless that understanding or representation is expressly stated in this contract.

(End of clause)

52.252-1 SOLICITATION PROVISIONS INCORPORATED BY REFERENCE (FEB 1998)

This solicitation incorporates one or more solicitation provisions by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. The offeror is cautioned that the listed provisions may include blocks that must be completed by the offeror and submitted with its quotation or offer. In lieu of submitting the full text of those provisions, the offeror may identify the provision by

paragraph identifier and provide the appropriate information with its quotation or offer. Also, the full text of a solicitation provision may be accessed electronically at this/these address(es):

[Insert one or more Internet addresses]

(End of provision

52.252-2 CLAUSES INCORPORATED BY REFERENCE (FEB 1998)

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this/these address(es):

[Insert one or more Internet addresses]

(End of clause)

252.201-7000 CONTRACTING OFFICER'S REPRESENTATIVE (DEC 1991)

(a) "Definition. Contracting officer's representative" means an individual designated in accordance with subsection 201.602-2 of the Defense Federal Acquisition Regulation Supplement and authorized in writing by the contracting officer to perform specific technical or administrative functions.

(b) If the Contracting Officer designates a contracting officer's representative (COR), the Contractor will receive a copy of the written designation. It will specify the extent of the COR's authority to act on behalf of the contracting officer. The COR is not authorized to make any commitments or changes that will affect price, quality, quantity, delivery, or any other term or condition of the contract.

(End of clause)

Explosive Research & Development Loading Facility
Section 00800
SPECIAL CONTRACT REQUIREMENTS
INDEX

1.1 COMMENCEMENT, PROSECUTION AND COMPLETION OF WORK
1.2 LIQUIDATED DAMAGES - CONSTRUCTION
1.3 EQUAL OPPORTUNITY PREAWARD CLEARANCE OF SUBCONTRACTORS
1.4 INSURANCE - WORK ON A GOVERNMENT INSTALLATION
1.5 PERFORMANCE OF WORK BY THE CONTRACTOR
1.6 CERTIFICATES OF COMPLIANCE
1.7 IMPLEMENTING GUARANTEES
1.8 NOT USED
1.9 CONTRACT DRAWINGS, MAPS AND SPECIFICATIONS
1.10 RECORD DRAWINGS
1.11 DESIGNATION OF PROPERTY ADMINISTRATOR
1.12 PHYSICAL DATA
1.13 PRICING OF ADJUSTMENTS
1.14 PAYMENT FOR MATERIALS DELIVERED OFF-SITE
1.15 EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE
1.16 ALTERATIONS IN CONTRACT
1.17 AVAILABILITY AND USE OF UTILITY SERVICES
1.18 SALVAGE MATERIALS AND EQUIPMENT
1.19 IDENTIFICATION OF GOVERNMENT-FURNISHED PROPERTY
1.20 CONSTRUCTION PROJECT SIGNS
1.21 LABOR SURPLUS AREA EXPENDITURE REQUIREMENTS
1.22 TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER
1.23 SCHEDULING AND DETERMINATION OF PROGRESS
1.24 IDENTIFICAITON OF EMPLOYEES
1.25 FIELD OFFICE
1.26 EXCLUSION OF PERIODS IN COMPUTING COMPLETION SCHEDULES
1.27 QUANTITY SURVEYS
1.28 TIME EXTENSIONS
1.29 MISPLACED MATERIAL
1.30 SUPERINTENDENCE OF SUBCONTRACTORS
1.31 PROCEDURES FOR SUBMISSIONN AND PAYMENT OF ALL CONTRACT PAYMENTS
1.32 VERIFICATION OF SMALL BUSINESS UTILIZATION
1.33 HAZARDOUS MATERIAL IDENTIFICATION & MATERIAL SAFETY DATA
1.34 SAFETY AND HEALTH REQUIREMENTS MANUAL
1.35 SPECIAL SCHEDULING REQUIREMENTS FOR MECHANICAL AND ELECTRTICAL SYSTEMS
1.36 SUBMISSION OF CLAIMS
1.37 PARTNERSHIP IMPLEMENTATION PLAN
1.38 PRECONSTRUCTION CONFERENCE
1.39 GOVERNMENT RESIDENT MANAGEMENT SYSTEM AND CONTRACT QUALITY CONTROL MODULE
1.40 DESIGN CONFERENCES
1.41 TRAINING
1.42 CONSTRUCTION COLOR BOARD SUBMITTALS
1.43 AFFIRMATIVE PROCUREMENT PROGRAM (Conservation & Recovery Act of 191976)
1.44 REGISTRATION OF CONTRACTOR PERSONNEL AND PRIVATELY OWNED VEHICLES
1.45 WARRANTY OF CONSTRUCTION WORK
1.46 DESIGN-BUILD CONTRACT-ORDER OF PRECEDENCE
1.47 CONSTRUCTOR'S ROLE DURING DESIGN PROCESS
1.48 PRE-PROPOSAL CONFERENCE AND SITE VISIT

1.1 COMMENCEMENT, PROSECUTION AND COMPLETION OF WORK

a. The Contractor should receive an administrative notice to proceed (NTP) within 21 calendar days from award of the contract. This duration includes time for the contractor to submit and government accept and approve FORM 1442 requirements prior to issuance of an administrative NTP. The administrative NTP will allow the Contractor to commence administrative and design work. The Contractor shall proceed with project design, submit designs for approval, and commence construction work after the approval of the final design. The Contractor shall be required to (i) commence work under this contract within 5 calendar days after the date the Contractor receives the administrative notice to proceed, (ii) prosecute the work diligently, and (iii) complete the entire work (design and construction) ready for use not later than Seven Hundred Thirty (730) calendar days after the date the Contractor receives the administrative notice to proceed, except in case the Contracting Officer’s Representative (COR) determines that seeding is not feasible during the construction period. The Contractor shall accomplish such seeding in the first planting period following the contract completion date. This action will not operate to extend the performance time for the balance of the work or result in additional payments to the Contractor. The work included in any optional bid items awarded shall be completed concurrently with the work in the Base Bid. The time stated for completion shall include final cleanup of the premises.

(a)1. The completion time includes all review time detailed in paragraph 7 of Section 01012 in this request for proposal.

(a)2. In the event of the HVAC system cannot be tested at or near temperatures during the above period, beneficial occupancy and use of the facility may be accepted and final testing and adjustments of the HVAC system will be deferred as specified in the appropriate testing clauses of the Technical Provisions.

(a)3. KEY PERSONNEL, SUBCONTRACTORS AND OUTSIDE ASSOCIATES OR CONSULTANTS: In connection with the services covered by this contract, any in-house personnel, subcontractors, and outside associates or consultants will be limited to individuals or firms that were specifically identified and agreed to during negotiations. The contractor shall obtain the COR’s written consent before making any substitution for these designated in-house personnel, subcontractors, associates, or consultants.

(a)4. RESPONSIBILITY OF THE CONTRACTOR FOR DESIGN:

(i) The Contractor shall be responsible for the professional quality, technical accuracy, and the coordination of all designs, drawings, specifications, and any other non-construction services furnished by the Contractor under this contract. The Contractor shall, without additional compensation, correct or revise any errors or deficiency in its designs, drawings, specifications, and other non-construction services.

(ii) Neither the Government's review, approval or acceptance of, nor payment for, the services required under this contract shall be construed to operate as a waiver of any rights under this contract or of any cause of action arising out of the performance of this contract, and the Contractor shall be and remain liable to the Government in accordance with applicable law for all damages to the

Government caused by the Contractor's negligent performance of any of the services described in paragraph (a) furnished under this contract.

(iii) The rights and remedies of the Government provided for under this contract are in addition to any other rights and remedies provided by law.

(a)5. SEQUENCE OF DESIGN-CONSTRUCTION:
(i) After receipt of the Contract Notice to Proceed (NTP) the Contractor shall initiate design, comply with all design submission requirements as covered under section 01012 DESIGN AFTER AWARD, and obtain Government review of each submission. No construction may be started, until the Government reviews the Final Design submission and determines it satisfactory for purposes of beginning construction or 90 calendar days after the Contractor's 95% design submission whichever is greater. The ACO or COR will notify the Contractor when the design is cleared for construction. The Government will not grant any time extension for any design resubmittal required when, in the opinion of the ACO or COR, the initial submission failed to meet the minimum quality requirements as set forth in the Contract.

(ii) If the Government allows the Contractor to proceed with limited construction based on pending minor revisions to the reviewed Final Design submission, no payment will be made for any in-place construction related to the pending revisions until they are completed, resubmitted and are satisfactory to the Government.

(a)6. CONSTRUCTOR'S ROLE DURING DESIGN PROCESS: The Contractor's construction management key personnel shall be actively involved during the design process to effectively integrate the design and construction requirements of this contract. In addition to the typical required construction activities, the Contractor's involvement includes, but is not limited to actions such as: integrating the design schedule into the Master Schedule to maximize the effectiveness of fast-tracking design and construction (within the limits allowed in the contract), ensuring constructibility and economy of the design, integrating the shop drawing and installation drawing process into the design, executing the material and equipment acquisition programs to meet critical schedules, effectively interfacing the construction QC program with the design QC program, and maintaining and providing the design team with accurate, up-to-date redline and as-built documentation. The Contractor shall require and manage the active involvement of key trade subcontractors in the above activities.

(a)7. CONTRACT DRAWINGS, MAPS, AND SPECIFICATIONS:
(i) The Government--
Under this contract, will provide the Contractor, without charge, five (5) sets of Request for Proposal (RFP) packages except publications incorporated into the technical provisions by reference.

(a)8. Existing Condition: Existing utilities and topography will be shown on the Site/Utility Plans.

b. Location: The site of work is located at Picatinny ARDEC, New

Jersey. The site of the work is on a military reservation and all rules and regulations issued by the Commanding Officer covering general safety, security, and sanitary requirements, etc., shall be observed by the Contractor. The Contractor should be aware of the new security regulations at Picatinny ARDEC. Potential delays may occur for contractor personnel and vehicles entering and leaving the installation due to heightened security measures. The Contractor will be briefed on security requirements during the pre-construction conference.

c. The Contractor shall furnish all labor, materials, equipment, costs, fee and services (except those furnished by the Government) for the following work: Design Build Explosive Research & Development Loading Facility, Picatinny ARDEC, New Jersey.

d. All work shall be in accordance with the RFP package or instructions attached hereto and made a part thereof, or to be furnished hereafter by the COR and subject, in every detail, to his supervision, direction, and instructions.

e. Magnitude of Construction Project: The estimated value of the proposed work, design and construction, is between $5 million and $7 million.

f. Throughout the construction period, the Army continues to have training requirements. The specific dates will be provided upon award and will be integrated as part of the Partnership Plan discussed in paragraph 1.37.

g. Contract requirements may be specified, in part or in whole, within the solicitation package, referenced Codes and other publications. Restating of a requirement does not relieve the Contractor of full compliance with all parts of the Solicitation package, referenced Codes and other publications, as well as, all parts of requirements, below. All contract requirements shall be implemented, and adhered to, by the Contractor and at the Contractor's expense.

h. The Contractor may only work at the project sites on weekdays between 7:00 AM and 5:00 PM. No work shall be performed on weekends, Federal Holidays, Picatinny Armed Forces Day, the day after Thanksgiving, and the days between Christmas and New Year's Day. Exceptions: Disconnections of existing utilities for tie-ins, and/or demolition, and/or other work requiring disconnection of existing utilities (e.g. such as work that presents a hazard to existing utilities). All work associated with such disconnections, shall be accomplished on a Saturday, and must be completed the same day the work is started. See "Utility Service Interruptions", below.

i. Utility Service Interruptions (USI) and Shutdowns: The Contractor shall submit written notification not less than 15 business days in advance of each USI/shutdown and/or tie-in and/or demolition of each utility and communication service to or within existing buildings and facilities. All USI shall be planned such that it will not exceed 4 hours, unless it can be demonstrated that additional time is required. The Contractor shall coordinate time and duration of all outages with the Army Installation (Base), through the Contracting Officer Representative (COR). Underground utility work shall be prepared within 2 days prior to the scheduled date of the USI by excavating/exposing the utility, and covering the open excavation with a steel road plate to accommodate traffic, as applicable. Prior to each USI/shutdown, the contractor shall be required to: 1) attend

a USI/shutdown coordination meeting, 2) demonstrate that all possible work associated with the USI/shutdown that can be performed without the USI/shutdown, has been performed, 3) demonstrate that all materials needed to perform the work during the USI/shutdown are on hand. Failure to comply with this requirement will result in the Government's cancellation of the USI/shutdown. Natural gas and electrical interruptions shall not be permitted when the ambient air temperature is expected to be below 60 degrees F.

Note: Where electrical lines and equipment are energized at a potential of 30 volts or more to ground, or where de-energized circuits are in close proximity to energized circuits (30 volts or more to ground), the energized circuits, electrical lines, and equipment must be disconnected from the power source, properly grounded and proven to be de-energized, before work is performed. For example, with regard to the term "close proximity", all circuits on utility poles or towers (two pole, four pole, etc.) must be disconnected from the power source, properly grounded and proven to be de-energized, before any work is performed on the structure(s).

j. Digging Permits, Road Closings, and Other Notifications: The Contractor shall allow 10 business days from date of written application to receive permission to dig in any area, and to close roads. Roads shall only be closed one lane at a time, and vehicular traffic shall be allowed to pass through the construction area. Work on or near roadways shall be flagged in accordance with the safety requirements in Safety and Health Requirements Manual EM 385-1-1, which forms a part of these specifications. The Contractor shall notify the COR 5 business days prior to any utility tie-in that does not require a USI/shutdown. The Contractor shall notify the COR 3 business days prior to concrete placements, and include trucking company name, driver's names, start/finish date/time of deliveries. Deliveries shall avoid rush hours. The Contractor shall notify the COR at the start of each workday, the location(s) to be worked for that day.

k. Notification and/or Request Requirements: The Contractor shall be responsible for any costs or impacts that are directly or indirectly the result of a Government's cancellation/non-acceptance, and subsequent Contractor's re-scheduling/re-performance, of a scheduled work activity/contract requirement, should the cancellation/non-acceptance be based upon the Contractor's failure to abide by the requirements of the contract, including proper notifications and/or requests.

l. With regard to the paragraph in this section entitled, "Availability and Use of Utility Systems", the Contractor is advised that compressed air, Picatinny ARDEC sanitary facilities (lavatories, rest rooms, sanitary sewers, etc.), and steam shall not be available for the Contractor's use, regardless of proximity to the project. The Contractor shall supply at his expense, utilities, as required. Telephone line availability: The Contractor shall coordinate temporary phone services with the local utility and the Picatinny Communications Department.
m. The Construction Limits, as defined herein, are located within Picatinny ARDEC property limits. Daily construction work site clean up shall be accomplished by the Contractor. This clean up shall include the placing of construction material and equipment in a neat and orderly arrangement. Rubbish, debris, rubble and garbage shall not be permitted to accumulate. If the Contractor has any dumpsters in the construction

limits, they shall be clearly marked with a sign "for private use only, not for use of base personnel." Dumpsters shall be emptied when contents mounds up to height of sides. Upon completion of all work outlined in the contract drawings and specifications, the Contractor shall remove from the confines of the Base, his construction materials and his equipment. The Contractor shall submit for COR approval, proposed layout of trailers. Contractor trailers on the work site shall be so located as to be shielded from view from base roads as effectively as possible and shall be identified with the contractors' name, emergency telephone number and address. Trailers shall be skirted, and skirts shall be painted to match trailer. The Construction limits, office and storage trailer locations must be kept clean and in an orderly manner at all times. Storage of materials/debris under the trailers is prohibited. Excess stockpiled soils and materials shall be removed within 30 days.

n. Protection of Government Property: The Contractor shall protect Government property and furnishings that may be in or adjacent to the work area with appropriate clean drop cloths, barricades, dust-stops, or other provisions as determined by, or approved by, the Contracting Officer Representative (COR) prior to starting work. The Contractor shall remove all debris, tools, materials and equipment and other items when work is completed in each particular area. The Protection shall include any buildings or other structures/features that could possibly be disturbed by the Contractor's activities, and to require that any resulting damage be repaired to the COR's satisfaction and at no cost to the Government.

o. Daily Clean-Up: Daily construction site clean up shall be accomplished by the Contractor. This clean up shall include, but not be limited to, the placing of construction material and equipment in a neat and orderly arrangement on the site. Equipment and materials must not block access to existing facilities. The Contractor shall inspect the site and area on a daily basis to ensure that all rubbish, debris, rubble, garbage paper, cardboard, demolition products and similar materials removed to provide a litter-free appearance. On-Base access routes utilized by construction equipment and/or delivery vehicles shall be maintained free from clay or mud balls, clods and mud. During the growing season (April through October), all grass areas in the Contractor's construction area or within ten feet of Contractor construction areas or within ten feet of buildings or portions of buildings under construction shall be mowed and trimmed to maintain neat grassy areas of reasonable length, by the Contractor. Grass height shall never be allowed to exceed six (6) inches.

p. Construction equipment may not be stored at work sites long term. If equipment is not used for a period of 21 calendar days, the equipment must be removed from site. The Contracting Officer Representative (COR) may approve exceptions to this condition, such as equipment required at a later date.

q. Parking on the grass is not permitted. The Contractor will not be allowed to drive on grass with his vehicles to gain access to the work sites. The Contractor and their personnel must park their vehicles within the construction limits. Grassy areas that are disturbed by the contractor shall be immediately repaired to their original conditions at the contractor's expense.

r. PICATINNY ARDEC REQUIREMENTS:

1.1 All persons working at ARDEC in connection with the contract, including employees of the contractor and all subcontractors and suppliers, shall conform to the applicable rules and regulations of ARDEC, including traffic and parking regulations.

1.2 ARDEC traffic rules and regulations are consistent with the motor vehicle laws of the State of New Jersey and are enforced by ARDEC Security Police and the U.S. Commissioner.

1.3 The following local rules and regulations shall be strictly complied with:

1.3.1 For the performance of this contract, the contractor shall employ only U.S. Citizens or non-U.S. Citizens residing in the United States, who legally entered the United States, and who can produce evidence of legal authority to be employed in the United States.

1.3.2 The contractor shall utilize only qualified, responsible and capable people in the performance of the work. The COR will require that the contractor remove from the performance of the work, employees who endanger persons or property, or whose continued employment under this contract is inconsistent with the interests of military security.

1.3.3 All employees of the contractor who will be performing work at ARDEC shall undergo a standard security check conducted by the Security Division of ARDEC, to include:

1.3.3.1 Issuance of an identification badge.

1.3.3.2 Completion of a short personal history.

1.3.3.3 Fingerprinting of the employee's, and other procedures deemed necessary for the security of the Center. At the time of the fingerprinting, the employee will be asked if he/she has ever been convicted of a crime other then a motor vehicle violation. Should a felony or a high misdemeanor be revealed, he/she may not be permitted to work on the project.

1.4 All contractor employees working on the U.S. Army installation, Picatinny ARDEC in the State of New Jersey, in connection with this contract, shall conform to all applicable federal or state laws, and published rules and regulations of the Departments of Defense and Army, as well as any applicable regulations promulgated by TACOM-ARDEC and/or Picatinny ARDEC, including but not limited to traffic regulations. Personnel and vehicles entering Picatinny ARDEC are subject to search, and this may result in a wait of 15-30 minutes or more if traffic is heavy. The contractor should also be aware that the contract work area is located in a secure area within Picatinny ARDEC. This secure area has its own controlled access gate in addition to the controlled access gates upon entering Picatinny ARCEC. All personnel and vehicles entering this secure area are subject search upon entering as well as exiting and may result in a wait of 5-15 minutes in either direction based on the particular time of day and amount of traffic entering the area. Additionally, all contractor employees working on classified contracts shall comply with the requirements of the National Industrial

Security Program (NISPOM) and Army Regulation 380-5, Department of the Army Information Security Program. The term "contractor employee" includes employees, agents, or representatives and all employees, agents or representatives of all subcontractors and suppliers. Contractors are responsible for obtaining/returning identification badges /passes and vehicle decals/passes for each contractor employee who will work on the contract or enter Picatinny ARDEC. The badges/passes/decals are required for the term of the contract until completion or until release of the employee. Procedures are subject to change. Prior to bidding, the contractor(s) shall consult with the Security Division of ARDEC and be fully cognizant of any and all security requirements, which may be in addition to those listed herein. Prior to entering, and while on ARDEC, the contractor(s) shall be subject to random identification checks of personnel and searches of personnel, vehicles, and their content. The contractor should also be cognizant that if the Base implements heightened security measures, up to two hour delays should be anticipated for entry and deliveries to ARDEC, or areas within ARDEC.

a. To obtain proper identification, contractor employees requiring recurring access (more than 90 days), must complete an application identification form (SMCAR 3058) for access to the installation. The form can be obtained from the Contracting Officer Representative (COR). The form must be signed by the CO or COR and also identify the contract number and expiration date before the badge can be issued. This form is brought to the Security Division, Badge and Identification Section, Visitor Control Center, for processing of proper identification required per terms of the contract. Badge & ID Office operating hours every Tuesday and Thursday, 0700 - 1200 hrs. Mondays, Wednesdays, and Fridays the operating hours are 0700 - 1200 hrs and 1300 - 1530 hrs. Vehicle Decals shall also be obtained and displayed as required. Contractors requiring access for less than 90 days will be required to obtain a pass (Visitor Registration Form) from the Visitor Control Center at the Main Gate. Passes will be issued for dates access is required, not to exceed 90 days. The contractor must notify the COR between 8:00 AM and 11:00 AM on the business day that precedes the day of arrival of any contractor employee without a valid badge/pass, seeking access to Picatinny ARDEC (Notification outside of this timeframe is not acceptable). The notification shall be submitted via email and Fax Memo, and with an attached electronic visitor notification form (MS Word file). One visitor notification form per contractor employee. The visitor notification form shall include basic identification information, and shall be obtained from the COR. Some of the basic identification information required includes: Name, US Citizenship Status, Employer name, address, telephone #, Vehicle make, model, license plate #. Status change in any information provided to obtain a visitor pass/ID Badge will render that visitor pass/ID Badge invalid, and require re-notification and re-processing at the Visitor Control Center. The subject header of the email shall include the contract title, "visitor notification", and the arrival date of the visitors. Only one arrival date is permitted per email message and vice versa.

b. For the performance of this contract, the contractor shall employ only employees who are U.S. Citizens or Lawful Permanent Residents.

c. Before contractor employees and vehicles will be granted a vehicle decal, badge or pass, and be allowed to access/work on Picatinny ARDEC, the contractor shall, at his own expense, furnish the COR and the Picatinny
Security Division the following at the time of processing:

i. Evidence of compliance with paragraph 1.4b above, including but not limited to supplying a copy of each employee's Employment Eligibility Form, INS Form I-9.

ii. A completed background check (including fingerprinting) by the New Jersey (NJ) State Police for NJ Residents, or a completed background check (including fingerprinting) by the State Police of the State that the contractor employee resides, or a completed background check (including fingerprinting) by the Federal Bureau of Investigation for Lawful Permanent Residents.

iii. Driver's license with photo, or other type of approved photo identification.

iv. Compliance with subparagraph 1.4a.

v. Current vehicle registration, insurance, DMV inspection sticker, and driver's license.
vi. Paper copy of the notification email and notification form, described above, as forwarded by the COR to the Picatinny Visitor Control Center.

d. Any delay in the furnishing of the above, including any delay in the obtaining of the background checks, is at the sole risk of the contractor and will not be the basis of any equitable adjustment or other change to the contract.

e. The contractor shall utilize only qualified, responsible, and capable employees in the performance of the work on the contract. The Contractor shall not employ persons for contract work to be conducted on the installation who have criminal history. The COR will require that the contractor remove from performance of work, employees who have a criminal history, endanger persons or property, or whose continued employment under this contract is inconsistent with the interests of military security. Additionally, the TACOM-ARDEC Commander may bar such employees from the installation.

f. The identification badge or pass issued to each employee of the contractor is for his own use only. Misuse of the badge or pass, such as permitting others to use it will result in criminal charges under Title 18 USC 499 and 701; and barring the employee from Picatinny ARDEC. Should the employee lose the badge or pass, the contractor may be charged for the cost of re-issuance of the badge or pass. Additionally, the employee and the contractor must submit a sworn affidavit as to the circumstances of the loss before a new badge or pass is issued.

g. Fingerprinting of employee and any other procedure deemed necessary for the security of Picatinny ARDEC may be required at the discretion of Picatinny Security.

1.4.1 All contractor employees, while on the premises at Picatinny ARDEC, shall continually wear the badge, obtained pursuant to above procedures. The badge shall be worn so as to be visible to others at all times. Individuals issued passes will have on their person the pass. Passes will be presented upon request by Security personnel or other government official charged with security of the area.

1.4.2 All contractor employees meeting with Government employees or attending meetings at Picatinny, shall, at the beginning of the meeting, announce to all other attendees that they are contractor employees, employed by (Name of Contractor's name/address), and the name of all other companies or individuals that currently employs them or that the contractor employee currently represents. In addition, contractor employees shall wear a visible badge that displays their company's name. If a visiting contractor is working on a classified contract his/her visit request with security clearance information must be approved by the ARDEC Industrial Security Specialist and be held on file the ARDEC Security Division. Government employees hosting meetings will verify the contractor employee's security clearance information is on file in the ARDEC Security Division prior to contractor access to classified information.

1.4.3 When the contract number under which the badge / pass was obtained is completed (date of last delivery or performance of last service, termination of the contract or release of the employee) including any exercise of an option pursuant to the terms of the contract, the contractor shall return the badges / passes for all of their employees to Picatinny Security and obtain a receipt for each within (3) three business days.

1.4.4 Failure to comply with the above requirements will be grounds for withholding any funds due the contractor until completion of the requirement, notwithstanding any other clause or requirements in the contract. Failure to comply may also be used as an adverse factor with respect to contractor past performance in connection with award of future contracts to the firm.

1.4.5 If the contractor obtains a new or follow-on contract for work at Picatinny ARDEC, he shall obtain new badges / passes for each of his employees indicating the new or follow-on contract number and comply with the applicable provisions of the follow-on contract which cover the subject matter of this Clause. This paragraph does not apply to the exercise of an option.

1.4.6 The contractor and each contractor employee working on Picatinny ARDEC shall sign a Non-disclosure Agreement on their company's letterhead prior to commencing work under the contract or obtaining the badges / passes required by subparagraph 1.4 above. There will be one Non-disclosure Agreement for each employee. The Non-disclosure Agreement shall be in the format indicated below.

1.4.7 The COR/Government Point of Contact (POC) shall coordinate the contractor's obtaining and returning of badges / passes and signature of the Non-disclosure Agreement. The contractor shall furnish, before initiating work under the contract, the COR/Government POC two (2) copies of each fully completed, signed,

SMCAR 3058 and non-disclosure statement for each contractor employee. One copy shall be maintained in the COR/Government POC file. The COR/Government POC shall furnish the other copy to the COR for inclusion in the official contract file.

1.4.8 Before any contractor employee can be given access to "non-public information" (as defined below) there must be a signed, written agreement between the recipient contractor/contractor employee and the owner of the non-public information. A copy of the agreement will be made a part of the contract file.

FORMAT FOR NON-DISCLOSURE AGREEMENT

I, _____, an employee and authorized representative of _____, a Contractor providing support services to Picatinny ARDEC or its tenants (hereinafter PICATINNY), and likely to have access to nonpublic information (hereinafter RECIPIENT), under contract number _____, agrees to and promises the following: WHEREAS RECEIPIENT is engaged in delivery support services to PICATINNY under contract; and WHEREAS, It is the intention of PICATINNY to protect and prevent unauthorized access to and disclosure of nonpublic information to anyone other than employees of the United States Government who have a need to know; and, WHEREAS, PICATINNY acknowledges that RECIPIENT will from time to time have or require access to such nonpublic information in the course of delivering the contract services; and, WHEREAS, RECIPIENT may be given or other have access to nonpublic information while providing such services; and, WHEREAS, "nonpublic information" includes, but is not limited to such information as: proprietary information (e.g., information submitted by a contractor marked as proprietary); advanced procurement information (e.g., future requirements, statements of work, and acquisition strategies); source selection information (e.g., bids before made public, source selection plans, and rankings of proposals); trade secrets and other confidential business information (e.g., confidential business information submitted by the contractor); attorney work product; information protected by the Privacy Act (e.g., social security numbers, home addresses and telephone numbers); and other sensitive information that would not be released by Picatinny under the Freedom of Information Act (e.g., program, planning and budgeting system information); NOW THEREFORE, RECIPIENT agrees to and promises as follows: RECIPIENT shall not seek access to nonpublic information beyond what is required for the performance of the support services contract; RECIPIENT will ensure that his or her status as a contractor employee is known when seeking access to and receiving such nonpublic information of Government employees; As to any nonpublic information to which RECIPIENT has or is given access, RECIPIENT shall not use or disclose such information for any purpose other than providing the contract support services, and will not use or disclose the information to any unauthorized person or entity for personal, commercial, or any unauthorized purposes; and If RECIPIENT becomes aware of any improper release or disclosure of such nonpublic information, RECIPIENT will advise the COR in writing as soon as possible. The RECIPIENT agrees to return any nonpublic information given to him or her pursuant to this agreement, including any transcriptions by RECIPIENT of nonpublic information to which RECIPIENT was given access, if not already destroyed, when RECIPIENT no longer performs work under the contract. RECIPIENT understands that any unauthorized use, release or disclosure of nonpublic information in violation of this Agreement will subject the RECIPIENT and the RECIPIENT's employer to administrative, civil or criminal remedies as may be authorized by law.

RECIPIENT: _____ (signature)
PRINTED NAME: _____
TITLE: _____
EMPLOYER: _____

1.5 Cameras shall not be used without obtaining a Camera Permit from Base Security through the COR, by Contractor’s written application. Minimum of 3 business days is required to process Camera Permit from date application is received.

1.6 The Contractor shall be responsible to maintain the access roads in the project sites, and shall keep the access roads clear of snow and ice to meet the Contractor's access needs.

2. HIGHWAY BARRICADES, WARNING SIGNS, AND ROOM SIGNAGE REQUIREMENTS:
2.1 Use of streets and highways within ARDEC by the contractor shall be subject to prior approval by the COR, and use shall be in accordance with state and local laws and regulations.

2.2 The contractor shall provide, erect and maintain adequate barricades, where directed by the COR, for the protection of work, the environment and the safety of the public. The contractor shall provide flagmen, danger signals and signs on all intercepted roads or highways on the site. The decisions as to what constitutes a hazard, and the manner in which a hazard will be marked, will rest with the COR. All barricades, obstructions, equipment and plants that encroach on or are adjacent to public rights-of-way shall conform to local and state laws. The contractor shall be responsible for all damages resulting from neglect or failure to meet these requirements. The expense of these and other precautions shall be borne by the contractor.

2.3 At all times during construction, each building room number shall be clearly marked by temporary signage in the vicinity of the associated door(s). At contract completion, the contractor shall provide permanent signage for each building room's associated door(s). The signs shall indicate the room number and name of the room. The signs shall meet UFGS and ADA requirements.

3. TEMPORARY STRUCTURES:
3.1 Permission of the COR shall be obtained prior to the erection of equipment and construction shanties and latrines.

3.2 The contractor shall provide for the use of his employees, where directed, ample temporary toilet facilities with sewer and water connections, or with dry toilets where specifically approved. The contractor shall maintain such places clean and free from flies. All connections and appliances connected therewith shall be removed prior to the completion of the contract, and premises shall be left perfectly clean. Locations of such temporary toilets shall be approved by the COR. Provisions of the EM 385-1-1 (latest revision) shall govern.

3.3 All connections to existing ARDEC utility systems, whether temporary or permanent, shall be made only upon the approval of the

COR. Request for the above services shall be made in advance to the COR, and shall be subject to his approval.

4. TEMPORARY HEAT:

4.1 Each contractor whose work requires temporary heat shall provide, at his own expense, heat that is necessary to prevent injury to work or materials through dampness or cold. Heat shall be maintained, as required, for scheduled progress and for good workmanship. Temporary heat equipment shall be approved by the ARDEC Safety Office and Fire Dept prior to use.

4.2 Use of salamanders or any other type of heating which may smoke or damage the finish in or near a facility shall not be allowed.

5. TRACKED VEHICLE (HEAVY EQUIPMENT) TRAFFIC ON GOVERNMENT PROPERTY: The utilization of tracked heavy equipment on government property by all contract personnel, in the performance of the contract requirements, shall adhere to the following:

5.1 Flat bed trailers or approved similar equipment shall be utilized to transport these types of equipment when in transit.

5.2 The contractor shall ensure that the loading and/or unloading of this type of equipment on or off of the conveyance vehicle shall be accomplished in a reasonably prudent manner to avoid damage to road pavement, parking lot pavement, sidewalks, curbing and grassy areas, whether lawn or not.

5.3 The contractor shall be obligated to make the necessary repairs and/or replacement to government property in the event that damage is incurred. The repairs or replacement shall restore the condition of the government property to its original condition. Repair/replacement expenses shall be at the sole cost of the contractor.

6. STANDARD SPECIFICATION: In every case where a Regulatory Agency, Military Specification, Federal Specification, Federal Standard or Standard Specification of a professional society (for an example, the American Society for Testing Materials) is referred to in these specifications, the latest revision in effect as of the date of the solicitation shall be considered effective.

7. REPLACEMENT AND PROTECTION OF GOVERNMENT-OWNED PROPERTY: All existing sidewalks, curbs and pavements disturbed, removed or otherwise damaged by the contractor, by or during the performance of the work under the contract, shall be replaced to their full thickness and original condition by the contractor. Replaced sidewalks, curbs and pavements shall be smooth, shall blend into existing work, and no depressions or humps shall exist in repaired areas. Unless specifically indicated otherwise, the replaced areas shall have straight saw cut joints, and the joints for sidewalks/curbs shall be composed of pre-molded joint filler 3/8 inch thick conforming to ASTM D 1751.

7.1 The contractor is not permitted to operate any existing Government utilities (i.e. switches, valves, etc.).

8. HOUSEKEEPING AND CLEAN-UP: Areas inside of buildings and trailers shall not be used for the storage of combustible material and shall be

regularly policed to prevent accumulation of debris and combustible waste.

9. ENVIRONMENTAL: Hazardous wastes shall be manifested in accordance with NJDEP and ARDEC Public Safety & Environmental Directorate rules and regulations.

9.1 The contractor shall notify the COR 7 days prior to cleaning, chlorination, flushing etc. of waterlines, as well as, testing of waterlines for chlorine, bacteria, etc. This is for the purpose of allowing the Picatinny EAO and DPW's water system contractor to witness the above. Laboratory certification is required to assure a chlorine concentration of 25 mg/L for a 24-hour period. Liquid Sodium Hypochlorite shall be used for disinfections. All waterline disinfections and testing shall be accomplished in accordance with NJDEP and AWWA C651, and other applicable contract requirements.

9.1.1 Chlorinated water may be discharged into sanitary sewer system, only within NJDEPE ppm limits or less than 25 mg/L (whichever is less), and then, only under the following procedure: The contractor shall submit a letter to the COR 10 days prior to the discharge date that contains: Description of activity, Date of discharge, Estimated Quantity, Duration of discharge (start/finish time), Test Report proving Concentration of Chlorine (ppm). The COR shall send the letter to RVRSA (Attn: Ed Hoe) through the Picatinny Environmental Affairs Office (EAO). The contractor may not discharge chlorinated water onto the ground or water source.

9.1.2 After waterlines are flushed to the residual of 1 mg/L or less of chlorine, two sets of certified bacteriological sampling and testing shall be done 24 hrs apart for every 1200 feet of waterline. Failure of any bacteriological test sample to meet applicable requirements shall require the contractor to re-chlorinate, flush and test at his expense.

9.2 The Contractor must obtain an Army Radiation Permit in order to bring any approved radiation emitting material or equipment onto Picatinny ARDEC, including soil density testing equipment. A minimum of 30 days shall be required to process the related permit application.

9.3 The Contractor shall be responsible to identify, obtain, and adhere to any required Local, State and Federal Permits/Notifications required for construction. Permit applications/Notifications shall be prepared by the Contractor and submitted to the COR along with a check (made payable to the required Authority) that covers any associated fees. The COR will forward the permit application(s) to the Picatinny EAO for review. A minimum of 30 days shall be required to review the related permit application. If the permit application(s) are in order, the Picatinny EAO shall forward to the required Authority.

9.4 The Contractor shall prepare a Soil Management Plan that specifies the procedures the Contractor will implement to account for excavated soil. Excavated soil that is stockpiled shall be labeled to indicate the location it was excavated from. The

Contractor shall submit soil manifest documentation 5 business days prior to transporting any soils.

9.5 In addition to above disinfection requirements, and prior to being granted use of the Picatinny ARDEC water supply, the Contractor shall provide and install approved permanent underground shut-off valve(s) and valve box(es) at any tie-in point, as well as, "RPZ" type backflow prevention device(s) downstream of any tie-in(s) to the Picatinny ARDEC water distribution system.

9.6 Picatinny ARDEC is home to all types of wildlife. It shall be the Contractor's responsibility to manage potential encounters safely, and in accordance with all related Federal, State and Local laws and regulations.

9.7 Tree-cutting is not permitted from April 1 through November 15.

9.8 Fuel burning equipment shall be provided with mechanical fuel meters, and diesel engines shall also be provided with engine-hour meters. In the event of a power failure, electronic engine-hour meters (if selected) must retain memory of prior reading.

9.9 All parts of any system using/carrying fuel (i.e. storage tanks, piping, etc.) shall be provided with secondary containment and leak detection if there is potential for a system fuel leak to drain into a watercourse, or into a ditch, sewer, pipe or storm drain that leads directly or indirectly into a watercourse or public sewage treatment plant.

10 ELECTRICAL: In addition to compliance with other contract-specified criteria, the contractor shall also design and install its portion of the electrical distribution system to comply with all local utility (Sussex Rural Electrical Cooperative) standards and requirements.

10.1 Cable spans between utility poles shall not exceed 150 feet. Only copper cable shall be utilized.

10.2 Underground grounding system connections shall be accomplished by exothermic welding, only.

10.3 All distribution panel boards shall be provided with 30% spare space for future loads.

10.4 All light fixtures provided shall be the energy efficient type.

10.5 Communications: Should the contractor be required to utilize existing underground conduit to install communications cable, the contractor shall first provide and install four (4) one-inch diameter inner ducts within the existing underground conduit that is to be utilized.

10.6 In office buildings and control rooms, all electrical/communication/control conduit/cable shall be concealed behind finished surfaces, and junction boxes shall be flush-mounted. In all other areas, all electrical/communication/control conduit/junction-boxes/cable shall be installed above ceilings, or at the roof structure elevation, to the maximum extent possible. Cable/wire shall not be installed exposed to view in any area.

10.7 The Picatinny ARDEC electrical distribution system has been privatized and is now the sole property of the Sussex Rural Electrical Cooperative (SREC). All contractors are now required to coordinate the connection/disconnection of temporary power (trailers, temporary power connections for construction, etc) directly with SREC. There will be an application that is required to be filled out and submitted to SREC with a $260.00 fee associated with the connection/disconnection of the electrical services. The Contractor shall pay the associated fee for each connection/disconnection of temporary and permanent electrical services. All electrical inspections of the temporary services to certify SREC requirements compliance will be the responsibility of the contractor. SREC is responsible for the purchase and installation of all primary components required to supply power to new, and renovated facilities. The contractor will be responsible to calculate the secondary load of the facility and make these calculations available to SREC so they can size and supply the appropriate transformer(s). The contractor will also be responsible to coordinate the location of the building service, or pad mounted transformer, with SREC.
For pad mounted transformers, the contractor will be required to install the reinforced concrete pad in accordance with SREC requirements, and run the secondary conductors to the point of connection. The contractor will be required to provide written certification to SREC that the electrical service(s) meets all the appropriate electrical codes in force at the time of his contract. The contractor shall be responsible to design the electrical secondary layout and transformer locations. This must be coordinated with SREC to ensure that SREC transformer and electrical primary installations meet contract requirements. Should an aspect of the contractor’s design mislead SREC to install transformer and electrical primary work out of contract compliance, the contractor shall bear the cost of any SREC corrective re-work. (For example, if the contract requires transformers to be located no closer than 50 feet from a building, however, the contractor’s design layout misleads SREC into installing a transformer 49 feet from the building, the contractor shall bear the cost to correct the deficiency).

11 MECHANICAL/PLUMBING: Steel reinforced concrete housekeeping pads shall be provided for all ground/floor mounted equipment. Unless specifically indicated otherwise, the pads and associated anchorage requirements shall be designed and sized to meet manufacturer's recommendations.

11.1 At the time of project turnover to the Government, the Contractor shall fill all fuel tanks provided under the contract to at least 50% full.

11.2 All piping/tubing shall be concealed from view above finished ceilings, or installed at the roof structure elevation, to the maximum extent possible. All control tubing shall be concealed from view.

11.3 The contractor shall perform Functional Performance Tests on all

HVAC Control Systems in accordance with the requirements indicated in UFGS Sections 15950A, 15951A and 15995A.

12 FIRE PROTECTION: No part of Fire Alarm and Suppression System(s) shall be from a sole source supplier.

12.1 Pre-action valve(s) shall meet the requirements of Viking Model E-1, or approved equal.

12.2 Fire Dept auto dialer shall be provided (including phone line connection), and shall meet the requirements of 911-A NotiFire, or approved equal. Pull stations shall not have glass or plastic rods. Fire Extinguishers shall be stored in an FEC at all fire extinguisher required locations within office type structures. The Contractor's selection of Fire Extinguisher Cabinet (FEC) sizes/types is subject to the approval of the Picatinny Fire Inspector and the COR.

12.3 A fire alarm condition shall shutdown the building's HVAC System(s) until the alarm condition is cleared and reset at the Fire Alarm Panel(s), which shall automatically reset the HVAC System(s).

13 ARCHITECTURAL: All joints shall be sealed in accordance with UFGS 07900A, unless specifically noted otherwise.

13.1 The contractor shall install mechanically fastened roof snow/ice guards in any location where snow/ice may slide off a roof onto walkways, vehicles, equipment and structures.

13.2 Steel reinforced concrete dumpster pads (for trash dumpsters) shall be installed for all buildings.

13.3 All doors shall be provided with lever latch handles, "BEST" (or
"BEST" compatible) heavy duty hardware, and locksets (7-pin combination cores), as per Picatinny ARDEC Standards.

13.4 Overhead coiling doors shall be insulated, operated by means of electric power with auxiliary chain hoist, and mechanically lockable by keyed lock that is interlocked electrically to prohibit motor operation when locked. All doors designated as "overhead doors" shall be the coiling type, and meet all the requirements of this paragraph and the RFP.

13.5 Equivalent finished floor elevations shall be maintained on either side of door thresholds, regardless of floor finishes.

14 SEWER: Sewer piping and associated fittings shall be PVC or Ductile Iron materials, only. Minimum gravity sewer pipe diameter shall be 8 inches or greater for mains, and shall be 6 inches or greater for laterals. Minimum force main pipe diameter shall be 4 inches or greater. Minimum pipe depth shall be 4 feet or deeper. Sewer manholes shall be pre-cast concrete type, only. Frames and covers shall be cast iron or ductile iron type, only. Manhole covers shall be the watertight type in paved areas. All manhole frames shall be mechanically fastened to concrete manhole with gasketed connection. All sewer piping within 18 inches of a waterline and/or crossing over a waterline shall be concrete-encased. Top of manhole covers shall be installed at 2 inches above grade in unpaved areas, and surrounding

grading shall be sloped to direct water away from manhole. Manhole covers shall be installed in paved areas such that top of manhole covers are slightly above grade with surrounding area sloped to direct water away from manhole while maintaining a smooth traffic condition.

15 COORDINATION WITH AND REQUIRED EQUIPMENT/WORK/FEES FROM OUTSIDE AGENCIES/UTILITIES: It is required that the Contractor make all necessary coordination with, and make payment of all necessary fees and compensation to, outside agencies/utilities who’s equipment/services are required to turn over a complete and usable project to the Government.

s. Electronic Documents and Communication: The Contractor (and its Designer, where applicable) shall utilize electronic mail (email) at its Home and Field Offices to communicate with Government whenever possible. The Contractor shall utilize software that is compatible with the Government's software. This mode of communication shall be utilized for the purpose of coordinating with the Government such items as design review comments, general coordination, Requests for Information, Notices of Non-compliance, all types of notifications including meetings/tests/training/USI and shutdown requests/concrete placements/Digging Permits and Road Closing Requests/Visitor Notifications/etc., and any other items that do not require formal correspondence. The Contractor shall periodically check for email messages throughout each day. When it is not possible to utilize email due to ISP problems, or other reasons beyond the Government's or Contractor's control, communications may be via Fax Memo. Note that Requests for Information shall be submitted in an MS Word file format, and include all contract-identifying information, and all related contract references. Within 24 hours of submitting/mailing the required hard copies, the Contractor shall submit, via email in “Read-Only” MS Word format, any written correspondence, plans, and reports. Any attachments not in MSWord, shall be electronically sent in “low-density” Acrobat Reader files. The Contractor shall submit an advance copy via email of any written correspondence that is, or may lead to, a request for equitable adjustment.

t. Disposition of scrap from demolition, clearing/grubbing, and salvageable materials resulting from construction is the responsibility of the contractor unless specifically noted otherwise. Material and equipment to be salvaged under this contract shall be prepared for disposition as herein specified and shall be crated, packaged or provided with skids as required. Salvaged materials and equipment shall be prepared in accordance with installation requirements and guidelines and delivered to the designated warehouse or storage area and stored.

u. The Contractor shall select materials and equipment by coordinating contract requirements with manufacturer's instructions/recommendations, and shall review manufacturer's instructions/recommendations in Preparatory Inspection Meetings.

v. The Contractor shall present all submissions to the COR in a professional and consistent manner. Submittals that fail to meet presentation requirements (including prescribed collation and fastening) will be returned to the Contractor without action.

1. The Contractor shall present the required Certified Payrolls and Basic Records (CPBR) to the COR as follows: All submissions shall be consistent with other submissions. Submissions shall be separate for each subcontractor, and shall be consistent in date order. The payroll sheets of the CPBR shall be the first pages with the Statement of Compliance on the reverse or attached as the last sheet. Each CPBR shall be separate (unattached) from the others, and each CPBR shall indicate the total workforce number of hours worked by summing all workers' hours worked for the week.

2. All items requiring submission to the Government shall be submitted in accordance with Section 01330, SUBMITTALS, and shall be presented by the Contractor in a manner prescribed by the COR at the Quality Control Mutual Understanding and Coordination Meeting. Meeting specified under Section 01451, Contractor Quality Control. In addition to and with hard copies of submittals, the Contractor shall provide all submittals in electronic format on CD ROM. These electronic files may be of the following formats: MS Word, Acrobat Reader, and drawings may be CAD with the appropriate CAD viewer included.

w. The Contractor shall conduct a Bi-Weekly Meeting at Picatinny ARDEC with the purpose of briefing Government personnel fully on various topics. The meeting shall cover progress reports, previous meeting minutes, old business, outstanding submittals, modification log, Request for Information log, critical issues, delays, quality of work in place, new business, and safety. The contractor shall provide a two-week look ahead schedule at the meetings to include work activities, preparatory meetings, testing, training, roadwork, and utility tie-ins. The Contractor shall provide copies of a meeting agenda to all meeting participants covering the above. The Contractor shall provide written minutes to the Meeting within 48 hours via email to all attendees, as well as, hard copies.

x. Contractor Coordination and Verification of Details and Dimensions:

1. The Contractor shall not attempt to utilize contract documents as shop/working drawings. The Contractor shall be responsible to verify all details and dimensions in the contract documents to include field verification, and shall coordinate/detail all facets of construction in shop drawings. The Contractor shall detail in the shop drawings, and implement, any alterations/additions necessary to provide a finished product that is aesthetically consistent, operable, and properly fits among all components.

2. Mechanical/Plumbing contractor(s) shall submit coordinated equipment layout drawings that shall include plan, elevation, and section views complete with dimensions indicating equipment sizes and locations in relation to floors, ceilings, walls and other equipment. Equipment shall be laid out to: meet safe egress requirements, meet manufacturer's recommendations, allow for equipment servicing and maintenance (e.g. Coil, filter changing, etc.), accommodate room door swings and access, consider condensate piping to drains, and avoid tripping and head clearance hazards, etc. The drawings shall be signed by the prime, mechanical, plumbing, and electrical contractors.

y. The Contractor shall obtain the services of a licensed Professional Engineer (Civil) registered in the State of New Jersey, who will prepare as-built drawings, NJDEPE Form WQM-005 and adhere to its requirements, any

other required forms, and test reports for all work associated with the sanitary sewer and/or septic system. He shall submit six (6) original copies of each that shall bear his original signature and embossed seal.

z. Testing of sanitary sewer and/or septic systems and components shall be in accordance with NJDEPE and RVRSA requirements, and witnessed by a Rockaway Valley Regional Sewer Authority (RVRSA) representative. The Contractor shall coordinate testing with RVRSA through the COR and Picatinny Environmental Office, who will contact RVRSA to witness the testing. Testing shall be scheduled around RVRSA availability. The Contractor shall directly pay RVRSA for associated fees.

aa. The Contractor shall submit for approval; Test Plans, Operations and Maintenance (O&M) Manuals, and Summarized Schedule of Maintenance Instructions, for all systems no later than 120 days prior to the original contract completion date, or for all systems associated with an identified contract phase no later than 120 days prior to that original contract phase completion date. A 'system' is an entity comprised of a series of closely related interdependent components and which is capable of independent performance of a useful function. System components shall include all software and programming as applicable for the system. Some typical examples include: HVAC Systems, Fire Alarm Systems, High Voltage Equipment, Low Voltage Switchboard, etc. In addition to any posting of operating procedures as may be required elsewhere in this contract, any equipment or system for which proper operation or maintenance is critical in order to preserve warranties, prevent damage, or for reasons of safety shall have proper operating procedures and a Summarized Schedule of Maintenance Instructions posted near the equipment, system, or near the operating point. The Summarized Schedule of Maintenance Instructions shall be inclusive and specific of all system components, indicate frequency of maintenance for each maintenance item, and briefly describe each maintenance procedure and cross-reference the Volume and page # of the O & M Manual that details each maintenance procedure. Training shall include review of the Summarized Schedule of Maintenance Instructions and O & M Manual cross-references. Instructions shall be protected by 1/16 inch thick plastic sheet.

bb. The Contractor shall submit, prior to the Pre-Final Inspection, an Equipment-In-Place List for all contract equipment installed that contains the following tabulated information for all equipment: Contract Descriptive Name, Manufacturer, Model No., Serial No., Cost ($). The equipment list shall be sequentially organized by associated system. Also, submit in electronic format in MS Word file.

cc. The Contractor shall incorporate in the design, all applicable Unified Facilities Guide Specifications (UFGS), and adhere to all UFGS requirements. Any UFGS that pertains to a facet of work shall be utilized, and its requirements adhered to. See http://www.hnd.usace.army.mil/techinfo/gspec.htm. The Contractor shall perform tests for all systems and components. Performance testing shall be accomplished in accordance with UFGS, as applicable, for all systems. Testing for integrity of all components, such as piping, wiring, etc. shall also be accomplished in accordance with UFGS, as applicable. Where the UFGS is not applicable, testing shall be conducted per applicable codes. Test Reports shall be submitted for all tests performed in the format indicated in SECTION, "TESTING FOR MECHANICAL AND ELECTRICAL SYSTEMS". The Contractor shall submit prior to the start of construction,

in addition to the requirements in Section, DESIGN AFTER AWARD, an electronic version of the 100% design specifications.

dd. The Contractor shall notify the COR of scheduled dates/times of tests and training a minimum of 15 days prior to the proposed dates of tests and training. Tests and training shall not take place without proper notifications. Testing and Training may not be scheduled without prior approval of the associated Test Plan and O & M Manual, respectively. Tests and training shall be spaced a minimum of two days apart. System testing shall not take place until all system components have undergone required successful testing (i.e. fire alarm system shall not be tested before piping has been successfully pressure tested, etc.). All project testing shall be successfully completed no later than 14 days before the overall project Final Inspection. Training shall not take place on any system until all associated testing has been successfully completed. Tests/training that do not commence within one-half hour of the scheduled time or are delayed by more than one-half hour during testing/training, shall be cancelled and re-scheduled.

ee. Contract work area restrictions and phasing requirements: The Explosive Research & Development Loading Facility (ERDLF) shall be sited within the controlled access zone of Area 200 at Picatinny ARDEC. ERDLF siting shall maintain minimum clear construction and construction related activities separation distances [approximately 400 feet from the existing building #225] and as identified within the Site Safety Plan (SSP). There should be a minimum of Twenty-five (25) feet from the edge of any explosive arc to the new facilities, providing allowance for contractor access around the construction site without breaching the existing explosive safety arcs. The new facilities should be constructed as close to the existing building #225 without impacting explosive safety arcs plus the aforementioned 25 foot construction buffer. The facilities may also be positioned between the existing 5th Avenue and Phipps Road. Siting of these facilities shall also maintain a minimum clear separation distance of 50 feet from the adjacent wetlands area. The contractor shall only be permitted in the areas of project work and construction limits throughout the contract duration according to the limitations and restrictions indicated in this contract. The contractor shall be flexible during his efforts to accomplish work, which may include but not be limited to stopping and re-starting work to accommodate Government use of other explosive buildings. Work to be accomplished in occupied building, or that will interrupt utilities, must be coordinated with the Contracting Officer Representative. The contractor shall provide signage and temporary fencing as required to control contractor employees' movements, and assure contractor employees do not leave construction limits and do not encroach upon safe distance buffer zones. The contractor shall ensure that emergency vehicles will have access to all buildings in the area, at all times during construction. The contractor shall coordinate its design, construction, and project scheduling to comply with the above phasing and work area restriction requirements.

ff. Not Used.

gg. Prior to commencing construction work, or whenever the ground surface is to be disturbed deeper than three inches, or when erecting structures or operating equipment near overhead lines, the Contractor or any Subcontractors performing work shall notify the COR 15 days in advance.

hh. Welding Operation: All welding and burning operations shall be accomplished in strict compliance with the requirements outlined in the National Fire Protection Association Standard, and the Department of the Army Corps of Engineers General Safety requirements Manual EM 385-1-1. Prior to starting welding, cutting, brazing, burning and/or any other flame or spark producing operations, the Contractor or Subcontractor performing the work shall obtain a burning "hot work" permit from the Base Fire Department. This permit is the only acceptable authorization for performance of this type of work. The request for this permit can be accomplished by contacting the Picatinny Fire Department at (973)724-4690/3097 a minimum of one business day before the "hot work" is to commence. The Contractor shall pick up the permit from the Picatinny Fire Department. A copy of each permit shall be retained at the project site until work for which the permit was issued is completed. The Contractor or Subcontractor shall provide required equipment, materials, shield, extinguishers, sand and other devices at each location where work of the type requiring a permit is conducted.

ii. Temporary Construction: Upon completion and acceptance of the construction, the Contractor shall remove all signs of temporary construction facilities such as work areas, structures, foundations of temporary structures, stockpiles of excess or waste materials, debris, and other vestiges of construction. All areas shall be restored to pre-contract construction conditions, including grading, sodding and other restorations.

jj. Landscape Protection: Provide protection for all existing landscape features such as trees, shrubs, bushes, plantings and sod in and around the area of construction. No existing tree, shrubs, bushes or other items shall be affected in any way, by Contractor actions, unless required by specifications. Prior to any demolition or construction in proximity to any existing landscape feature, fencing shall protect the feature, barricades, temporary removal and/or other approved devices. When construction requires that heavy machinery work in close proximity to existing mature trees, the trees shall be protected. The Contractor shall replace in kind all damaged items with new.

kk. Trenching and Excavation: Excavation and related work shall be completed in scheduled phase between blocks or manholes for installations requiring testing. Work shall be barricaded in accordance with US Army Corps of Engineers Safety Manual EM 385-1-1. For excavations in which testing is not required, the trenches shall be backfilled at the end of the day except for the last 15 feet. Backfilling must be accompanied daily; established structures and plantings must be avoided; excavation shall not begin until material and equipment for the specified portion of the job is available on the site. Trenches or excavations which cut (must accomplish by saw-cutting) roads, parking lots, driveways and delivery routes shall be fully coordinated between the Contractor, and the Contracting Office Representative a minimum of 15 business days prior to excavation. The Contractor shall provide non-skid surface, steel road plates until the vehicle routes are permanently repaired. Excavations and the repair, which will traverse completely across vehicle routes, shall be scheduled in stages, which allow crossing of vehicles until road plates, and/or permanent repairs are in place. Traffic Plans shall include proposed detours and signage, and shall be submitted for approval, as applicable.

ll. Barricades are required in accordance with the referenced safety regulations. Each job site shall be clearly identified by signs, and protected by barriers suitably marked by reflective materials, and illumination for easy sighting after dark.

mm. Severe Weather Warning Requirements: When notified by the Contracting Officer Representative that a severe weather warning has been issued for the area in which construction is being performed, the Contractor shall immediately take action to tie down, or otherwise secure structures, materials and equipment on the job site that could become missiles as a result of strong surface winds, thunderstorms, or other weather related conditions. This requirement is applicable twenty-four (24) hours per day, seven (7) days per week. The Contractor shall provide an emergency phone number that will enable the COR to reach him 24 hours per day, 7 days per week.

nn. Construction Limits and Access Route: In order to minimize impact to the base traffic and to the visual appearance of the Base during the construction, the Contractor shall perform the work in accordance with the following:

1. Construction limits for the project shall be as shown on the drawings. All construction activities are to be contained within the construction limits as designated on the drawings, including lay down, shake out and storage.

2. Contractor may be limited in the number of trailers due to the availability of space as determined by the Government. This limitation is inclusive of Contractor and his Subcontractors. If Contractor requires additional office and storage trailers, revision to their location, or revision to the Construction Site Layout drawings, the Contractor shall submit written justification to the Contracting Officer Representative and obtain his written approval before proceeding. Any trailers, offices and storage buildings housed by the Contractor or his Subcontractors on Picatinny ARDEC shall be painted the standard base color.

3. All material deliveries will be through the Picatinny ARDEC truck gate, unless otherwise directed by the COR. All truck delivery drivers must be familiar with the Construction Access Route to the site(s). Deliveries shall process in at the Scale House (at the truck gate), and at Bldg 91 (in the vicinity of the truck gate). If the driver(s) are not familiar with the route, they shall require an escort to the construction site(s), provided by Contractor at his expense. The Contractor shall notify the COR 3 business days prior to all deliveries. If the Contractor requires additional construction storage area, beyond that provided at the site, for trailers, etc., other storage space on Picatinny ARDEC may be made available for the Contractor’s use, however, the cost for development and improvement of this additional storage area is by Contractor at his expense. The use of this additional storage area must be coordinated and approved by the COR.

oo. Dumpsters: Equip dumpsters with a secure cover. The cover shall be closed at all times, except when being loaded with trash and debris. Locate dumpster(s) behind the construction fence and out of the public view. Empty site dumpsters at least once a week, or as needed of keep the

site free of debris, trash, and wildlife. If necessary, provide 208-liter (55-gallon) trash containers to collect debris in the construction site area. Locate the trash containers behind the construction fence or out of public view. Empty trash containers at least once a day. Large demolition normally requires a large dumpster without lids-these are acceptable but should not have debris higher than the sides before emptying.

pp. Temporary Sanitation Facilities: All temporary sewer and sanitation facilities shall be self-contained units with both urinals and stool capabilities. Ventilate the units to control odors and fumes and empty and clean them at least once a week or more often if required by the COR. The doors shall be self-closing. Locate the facility behind the construction fence and out of the public view.

qq. The Contractor shall preserve the integrity of all existing fences throughout the project to continuously maintain Picatinny security. All fencing shall be considered security fencing. New fencing shall be installed in a manner to maintain continuous security. Prior coordination with the COR is required for any fence openings. Failure in this area will result in the Contractor being fined by the COR.

rr. Reference Section 01451, CONTRACTOR QUALITY CONTROL. The following are contract inspection scheduling requirements for the overall contract and (contract item, if applicable), and shall be indicated in the Contractor's Progress Schedule as critical path activities. CQC System Manager Punch-Out Inspection: no later than 6 weeks before completion date of contract or contract item. Pre-Final Inspection: no later than 4 weeks before completion date of contract or contract item. Final Inspection: no later than 2 weeks before completion date of contract or contract item.

1.2 LIQUIDATED DAMAGES - CONSTRUCTION

a. If the Contractor fails to complete the work within the time specified in the contract, or any extension, the Contractor shall pay to the Government as liquidated damages, the sum of $577 for each day of delay.

b. If the Government terminates the Contractor's right to proceed, the resulting damage will consist of liquidated damages until such reasonable time as may be required for final completion of the work together with any increased costs occasioned the Government in completing the work.

c. If the Government does not terminate the Contractor's right to proceed, the resulting damage will consist of liquidated damages until the work is completed or accepted.

d. At a time before the project is physically complete but is functionally complete to the satisfaction of the Government, the Government at its sole discretion may agree to accept transfer of the facility or project provided that the remaining work to be done ("punchlist") is completed no later than 30 days from the date of transfer. In this case the Contractor shall pay liquidated damages for punchlist items not completed in the daily amount of $144 per day commencing after 30 days of project transfer or after date required for project completion (including all extensions), whichever occurs later.

1.3 EQUAL OPPORTUNITY PREAWARD CLEARANCE OF SUBCONTRACTORS(APR 1984)

Notwithstanding the clause of this contract entitled "Subcontracts", the

Contractor shall not enter into a first-tier subcontract for an estimated or actual amount of $1 million or more without obtaining in writing from the COR a clearance that the proposed subcontractor is in compliance with the equal opportunity requirements and therefore is eligible for award.
(FAR 52.222-28)

1.4 INSURANCE - WORK ON A GOVERNMENT INSTALLATION

a. The Contractor shall procure and maintain during the entire period of his performance under this contract the following minimum insurance:

(1) General Liability Insurance (Comprehensive form of policy):
Bodily Injury Liability - $500,000 per occurrence.

(2) Automobile Liability Insurance (Comprehensive form of policy):
Bodily Injury Liability - $200,000 per person and $500,000 per accident.
Property Damage Liability - $20,000 per accident.

(3) Workmen's Compensation and Employer's Liability Insurance:
Compliance with applicable workmen's compensation and occupational disease statutes is required. Employer's liability coverage in the minimum amount of $100,000 is also required.

b. Prior to the commencement of work hereunder, the Contractor shall furnish to the COR a certificate or statement of the above required insurance. The policies evidencing required insurance shall contain an endorsement to the effect that cancellation or any material change in the policies adversely affecting the interests of the Government in such insurance shall not be effective for such a period as may be prescribed by the laws of the State in which this contract is to be performed and in no event less than thirty (30) days after written notice thereof to the COR.

c. The Contractor agrees to insert the substances of this clause, including this paragraph c., in all subcontracts hereunder.

1.5 PERFORMANCE OF WORK BY THE CONTRACTOR (1984 APR)

The Contractor shall perform on the site, and with its own organization, work equivalent to at least twenty (20) percent of the total amount of work to be performed under the contract. This percentage may be reduced by supplemental agreement to this contract if, during performing the work, the Contractor requests a reduction and the COR determines that the reduction would be to the advantage of the Government. (FAR 52.236-1)

1.6 CERTIFICATES OF COMPLIANCE

Any certificates required for demonstrating proof of compliance of materials with specification requirements shall be executed in 4 copies. Each certificates shall be signed by an official authorized to certify in behalf of the manufacturing company and shall contain the name and address of the Contractor, the project name and location, and the quantity and date or dates of shipment or delivery to which the certification apply. Copies of laboratory tests reports submitted with certificates shall contain the name and address of the testing laboratory and the date or dates of the tests to which the report applies. Certification shall not be construed as relieving the Contractor from furnishing satisfying material, if, after tests are performed on selected samples, the material is found not to meet the specific requirements. (ECI 7-670.3)

1.7 IMPLEMENTING GUARANTEES
At any time subsequent to the acceptance by the Government of a completed installation under this contract, which installation is required to be covered by a specific guarantee under the terms of the various sections in the TECHNICAL PROVISIONS, the Base Commander will be an authorized party for the purpose of implementing the provisions of such guarantees in behalf of the Government.

1.8 NOT USED.

1.9 CONTRACT DRAWINGS, MAPS AND SPECIFICATIONS
See contract clause entitled CONTRACT DRAWINGS, MAPS AND SPECIFICATIONS in Section 00700 CONTRACT CLAUSES.

1.10 RECORD DRAWINGS

a. General: The Contractor will maintain as-built drawings during the construction period and will submit final record drawings at the completion of individual facilities. The Government will provide to the Contractor the CAD (Computer-Aided Drafting) files consisting of compact (computer) disks or magnetic media of the drawing files in the appropriate CAD format (i.e. "Microstation", "Autocad", etc.) for the project. The Contractor is required to make prints or mylars from the CAD files and continuously maintain drawings to show current as-built conditions for the duration of the construction. Except for updates as indicated below, the Contractor may maintain as-built drawings by marking up drawings by hand or by CAD methods. Scanned drawings will not be acceptable. If the Government cannot provide CAD files for the project drawings, mylar (reproducible) drawings will be provided. The contractor will then be required to comply with all requirements indicated herein by the use of hand drafting. The Contractor will be provided Microstation on CD ROM. The Contractor shall provide the Government updated CAD record (as-built) drawings in Microstation (or if AutoCAD is used it shall be in a CAD Universal format that will allow conversion to Microstation) in addition to the other deliverables contained herein (See subparagraph g). Note: If this project is a design-build construction type, where the Contractor accomplishes the design, the drawings will be developed by the Contractor in the appropriate CAD file format (or reproducible drawings) as prescribed by the contract, instead of the Government providing them to the Contractor. All other requirements indicated herein will apply.

b. Progress As-built Prints: During construction the Contractor is responsible for maintaining up to date one set of paper prints to show as-built construction conditions. These prints shall be kept current and available on the job site at all times. All changes from the contract plans, which are made in the work or additional information which might be uncovered in the course of construction shall be accordingly and neatly recorded as they occur by means of details and notes. The as-built prints will be jointly inspected for accuracy and completeness by the Contracting Officer's Representative and a responsible representative of the Contractor prior to submission of each monthly pay estimate. Progress as-builts shall show the following information, but not limited thereto:

(1) The location and description of any utility lines, valves, or other installations of any kind within the construction area. The location includes dimensions to permanent features.

(2) The location and dimensions of any changes with the building and structure.

(3) Correct grade or alignment of roads, structures or utilities if any changes were made from the contract plans.

(4) Correct elevations if changes were made in site grading

(5) Changes in details of design or additional information obtained from working drawings specified to be prepared and/or furnished by the Contractor including but not limited to fabricated, erection, installation plans and placing details, pipe sizes, insulation material, dimensions of equipment foundations, etc.

(6) The topography and grades of all drainage installed or affected as part of the project construction.

(7) All changes, which result from contract modifications.

(8) Where contract drawings or specifications allow options, only the option selected for construction shall be shown on the as-built prints.

(9) All amendments to the contract drawings issued during the solicitation period shall be posted on the as-built drawings.

c. Hand Drafting: If mylars only are provided to the Contractor, they shall be updated using hand drafting. Only personnel proficient in the preparation of engineering drawings to standards satisfactory and acceptable to the Government shall be employed to modify the mylar reproduction drawings or prepare additional new drawings. All additions and corrections to the contract drawings shall be neat, clean and legible, and shall match the adjacent line work and/or lettering being annotated in type, density, size and style. All drafting work shall be done using the same medium (pencil, plastic lead or ink) that was employed on the original contract drawings and with graphic lead on paper base material. The title block to be used for any new as-built drawings shall be similar to that used on the original contract drawings.

d. Protection of Records: The Contractor shall be responsible for the protection and safety of mylars and CAD record until returned to the COR. Any drawings damaged or lost by the Contractor shall be satisfactorily replaced by the Contractor at his expense.

e. 50% As-Built Update: At the 50% point in construction of this project (as determined by progress payments) the Contractor will update the CAD files of the project drawings in the appropriate CAD program to show as-built conditions as above, and submit an updated computer disk and one set of prints to the COR for approval. If mylars only are provided to the Contractor, they shall be updated at this stage using hand-drafting as specified herein, and the Contractor shall submit one set of prints to the COR for approval. Any required corrections will be made by the Contractor before payment will be approved for this item. The Contractor must use the updated CAD record or mylar drawings to produce required prints.

f. Preliminary Record Drawing Submittal: At least thirty calendar (30) days before the anticipated date of final acceptance inspection the Contractor shall deliver two copies of progress prints showing final as-

built conditions to the COR for review and approval. These prints shall correctly show all the features of the project as it has been constructed, adding such additional drawings as may be necessary. They shall be printed from the CAD files updated in the appropriate CAD program, or from updated mylars if mylars only were provided to the Contractor. Within ten days, the Government will provide the Contractor one set of prints indicating required corrections to the preliminary submittal. Contractor will correct and resubmit within 5 days. Any required subsequent review and resubmission periods will each be accomplished within 5 days. Upon Government approval of the preliminary submittal, the Contractor will prepare final record drawings.

g. Record Drawing Submission: In the appropriate CAD program each drawing shall be marked with the words "RECORD DRAWING AS-BUILT" followed by the name of the Contractor in font which will print at least 3/16" high. All revisions to the original contract drawings will be dated in the revision block. All prints and mylars must be reproduced from the updated CAD files. If mylars only were provided to the Contractor, they shall be hand-lettered or stamped as indicated above, and revisions shown in revision block. A minimum of 5 calendar days before the anticipated date of final acceptance inspection of the project the Contractor shall deliver to the COR: The submittal shall consist of the completed record drawings on CD ROM, one reproducible mylar, two blue line prints of these drawings, and the annotated construction record set from which the as-built files were prepared and the return of the approved marked-up as-built prints. Failure to make an acceptable submission of Record Drawings will delay the Final Acceptance Inspection for the project and shall be cause for withholding any payment due the Contractor under this contract.

h. Property: All paper prints, reproducible drawings and CAD files will become property of the Government upon final approval. Approval and acceptance of the final record drawings shall be accomplished before final payment is made to the Contractor.

i. Payment: No separate payment will be made for the as-built and record drawings or updating of CAD files required under this contract, and all costs in connection therewith shall be considered a subsidiary obligation of the Contractor.

1.11 DESIGNATION OF PROPERTY ADMINISTRATOR

The Chief, Property and Accounting Section, U.S. Army Engineer District, New York, Federal Building, 26 Federal Plaza, New York, N.Y. 10278-0090 is designated as Property Administrator, in connection with this contract.

1.12 PHYSICAL DATA

Information and data furnished or referred to below are furnished for the Contractor's information. However, it is expressly understood that the Government will not be responsible for any interpretation or conclusion drawn there from by the Contractor.
(FAR 52.236-4)

a. Weather Conditions: Climatological data determined from records of the U.S. Weather Bureau Station, Boonton, NJ
Mean Annual Temperature: 49.8 degrees F
Mean Annual Precipitation: 44.8 inches
See also paragraph entitled TIME EXTENSIONS FOR UNUSUALLY SEVER WEATHER.

b. Transportation Facilities:
Highways and Roads: US Route 80 and NJS Route 15 serve the locality of the proposed work. Roads within the military reservation proposed to be used by the Contractor, shall be subject to prior approval of the Post authorities and such roads, if used, shall be maintained throughout construction and shall be restored to as good condition as existed prior to their use. The Contractor shall also construct such temporary haul roads and bridges as may be necessary for the conduct of his work. Any such temporary construction shall be restored to its original condition. All costs for the use of existing transportation facilities, for the construction of temporary facilities, and for maintenance, repair, removal and restoration shall be borne by the Contractor.

1.13 PRICING OF ADJUSTMENTS

When costs are a factor in any determination of a contract price adjustment pursuant to the Changes clause or any other clause of this contract, such costs shall be in accordance with Part 31 of the Federal Acquisition Regulation and DFARS 52.215-7000 (APR 1985) as follows: In determining whether a pricing adjustment is expected to exceed $100,000, the term "pricing adjustment" shall mean "the aggregate increases and /or decreases in cost plus applicable profits."

1.14 PAYMENT FOR MATERIALS DELIVERED OFF-SITE

Pursuant to the Contract Clause in this contract titled: Payment Under Fixed-Price Construction Contracts", materials delivered to the Contractor at locations other than the site of the work may be taken into consideration in making payments if included in payment estimates and if all the conditions of the Contract Clauses are fulfilled. Payment for items delivered to locations other than the work site will be limited to those materials which have been approved, if required by the technical provisions; those materials which have been fabricated to the point where they are identifiable to an item of work required under this contract. Such payment will be made only after receipt of paid or receipted invoices or invoices with cancelled check showing title to the items in the prime contractor and including the value of materials and labor incorporated into the item.

1.15 EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE

a. Allowable cost for construction and marine plant and equipment in sound workable condition owned or controlled and furnished by a contractor or subcontractors at any tier shall be based on actual cost data when the Government can determine both ownership and operating costs for each piece of equipment or equipment groups of similar serial and series from the Contractor's accounting records. When both ownership and operating costs cannot be determined from the Contractor's accounting records, equipment costs shall be based upon the applicable provisions of EP 1110-1-8, *"Construction Equipment Ownership and Operating Expense Schedule," Region 1. Working conditions shall be considered to be average for determining equipment rates using the schedule unless specified otherwise by the COR. For equipment not included in the schedule, rates for comparable pieces of equipment may be used or a rate may be developed using the formula provided in the schedule. For forward pricing, the schedule in effect at the time of negotiation shall apply. For retrospective pricing, the schedule in effect at the time the work was performed shall apply. (* This manual can be ordered from the Government Printing office by calling telephone number (202) 783-3238. There is a charge for the manual.)

b. Equipment rental costs are allowable, subject to the provisions of

FAR 31.105(d)(ii) and FAR 31.205-36 substantiated by certified copies of paid invoices. Rates for equipment rented from an organization under common control, lease-purchase or sale-leaseback arrangements will be determined using the schedule except that rental costs leased from an organization under common control that has an established practice of leasing the same or similar equipment to unaffiliated lessees are allowable. Costs for major repairs and overhaul are unallowable.

c. When actual equipment costs are proposed and the total amount of the pricing action is over $25,000, cost or pricing data shall be submitted on Standard Form 1411, "Contract Pricing Proposal Cover Sheet." By submitting cost or pricing data, the Contractor grants to the COR or an authorizing representative the right to examine those books, records, documents and other supporting data that will permit evaluation of the proposed equipment costs. After price agreement the Contractor shall certify that the equipment costs or pricing data submitted are accurate, complete and current.

1.16 ALTERATIONS IN CONTRACT (APR 1984)

Portions of this contract are altered as follows: Add the following sentence to paragraph "g" of basic contract clause, SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION (1984 APR): "Upon completing the work under this contract, the Contractor shall furnish a complete set of all shop drawings as finally approved. These drawings shall show all changes and revisions made up to the time the equipment is completed and accepted."

Alt.1 (APR 1984) (FAR 52.236-21) (7-602.54 (b) (1) OCT 1976)

1.17 AVAILABILITY AND USE OF UTILITY SERVICES (APR 1984)

a. The Government shall make all reasonable amounts of utilities available to the Contractor without charge from existing outlets and supplies available to the Government on military installations. Otherwise the contractor shall make arrangements with local utility companies for connection, metering and payment for utilities at its expense. The Contractor shall carefully conserve any utilities furnished without charge. If the use of utilities is abused the Contractor will be required to meter and pay for utilities.

b. The Contractor, at its expense and in a workmanlike manner satisfactory to the COR, shall install and maintain all necessary temporary connections and distribution lines, and all meters where required. The Contractor shall furnish to the Contracting Officer Representative a complete system layout drawing showing type of materials to be used and method of installation for all temporary electrical systems. Telephone service is the responsibility of the Contractor. The Contractor shall maintain all temporary lines in a workmanlike manner satisfactory to the Contracting Officer Representative. Before final acceptance of the work by the Government, the Contractor shall remove all temporary connections, distribution lines, meters and associated paraphernalia. (FAR 52.235-14).

c. Utility Service Interruptions. The Contractor shall submit written notification not less than 15 calendar days in advance of each interruption of each utility and communication service to or within existing buildings and facilities being used by others. No single outage will exceed 4 hours unless approved in writing. The time and duration of all outages will be coordinated with the Using Agency by the Contracting Officer Representative. All outages or interruptions shall be scheduled

during weekends, unless specifically approved by the Contracting Officers Representative.

d. Digging Permits and Road Closings. No excavation whether minor or major including trenching, sidewalk replacement, etc. will be permitted without an approved digging permit. No road closure will be permitted without an approved permit. The Contractor shall allow 14 calendar days from date of written application to receive permission to dig and to close roads. Contractor will ascertain the name of the individual to submit the application from Government representative. Contractor shall carefully avoid contact or damage with any known or identified underground utilities. Roads shall only be closed one lane at a time, and vehicular traffic shall be allowed to pass through the construction area. Work on or near roadways shall be flagged in accordance with the safety requirements in Safety and Health Requirements Manual EM 385-1-1, which forms a part of these specifications. Work located along the alert force route shall not cause blockage, and the Contractor shall maintain unobstructed access for alert force traffic at all times. Contractor shall apply for renewal of work permits as required if the work continues beyond the original permit expiration date.

e. Metal Burning and Welding and Access to Confined Spaces. Permits for such work shall be obtained in advance as required by the operator of the facility. Contractor shall coordinate through Government Representative for such permits.

1.18 SALVAGE MATERIALS AND EQUIPMENT

The Contractor shall maintain adequate property control records for all materials or equipment specified to be salvaged. These records may be in accordance with the Contractor's system of property control, if approved by the property administrator. The Contractor shall be responsible for the adequate storage and protection of all salvaged materials and equipment and shall replace, at no cost to the Government, all salvage materials and equipment which are broken or damaged during salvage operations as the result of his negligence, or while in his care. (DoD FAR Supplement 52.236-7005)

1.19 IDENTIFICATION OF GOVERNMENT-FURNISHED PROPERTY (APR 1984)

None furnished.

1.20 CONSTRUCTION PROJECT SIGNS

The Contractor shall construct two signs; one for project identification and the other to show on-the-job safety performance.

a. Standard Army Corps of Engineer sign drawings together with fabrication specification and mounting detail will be provided to the Contractor in the pre-construction meeting. The signs shall be erected within 15 calendar days before commencement of physical construction work.

b. The two signs are to be displayed side by side and mounted for reading by passing viewers. Exact placement location will be designated by the COR.

c. No separate payment will be made for erecting and maintaining the signs and all costs in connection therewith will be considered the obligation of the Contractor. Upon completion of the project, the Contractor shall remove the signs from the work area.

1.21 LABOR SURPLUS AREA EXPENDITURE REQUIREMENTS (JUL 1978)

a. The site of the construction work is located in an area determined by the Secretary of Labor to be a Labor surplus Area. Accordingly the Contractor hereby agrees to perform a substantial portion of the contract work in this or in any other labor surplus area. "Substantial portion" means the aggregate costs that will be incurred by the Contractor and his first-tier subcontractors and suppliers, on account of manufacturing, production, or services performed in this or any labor surplus area, and the costs that will be incurred by second-tier and lower-tier subcontractors on the construction site will exceed fifty percent (50%) of the price of this contract.

b. Upon request, the Contractor shall furnish to the COR data to substantiate that this obligation is satisfied.

c. The COR will furnish upon request a list of labor surplus areas.

1.22 TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER

a. This provision specifies the procedure for determination of time extension for usually severe weather in accordance with the contract clause entitled "Default: (Fixed Price Construction)." In order for the Contracting Officer to award a time extension under this clause, the following conditions must be satisfied:

1. The weather experienced at the project site during the contract period must be found to be unusually severe, that is, more severe than the adverse weather anticipated for the project location during any given month.

2. The unusually severe weather must actually cause a delay to the completion of the project. The delay must be beyond the control and without the fault or negligence of the Contractor.

b. The following schedule of monthly anticipated adverse weather delays is based on National Oceanic and Atmospheric Administration (NOAA) or similar data for the project location and will constitute the base line for monthly weather time evaluations. The Contractor's progress schedule must reflect these anticipated adverse weather delays in all weather dependent activities.

MONTHLY ANTICIPATED ADVERSE WEATHER DELAY
WORK DAYS BASED ON (5) DAY WORK WEEK

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
(9)	(7)	(8)	(9)	(8)	(6)	(6)	(5)	(5)	(7)	(5)	(7)

c. Upon acknowledgment of the Notice to Proceed (NTP) and continuing throughout the contract, the Contractor will record on the daily CQC report, the occurrence of adverse weather and resultant impact to normally scheduled work. Actual adverse weather delay days must prevent work on critical activities for 50 percent or more of the Contractor's scheduled workday. The number of actual adverse weather delay days shall include days impacted by actual adverse weather (even if adverse weather occurred in previous month), be calculated chronologically from the first to the last day of each month, and be recorded as full days. If the number of actual adverse weather delay days exceeds the number of days anticipated in paragraph 2 above, the COR will convert any qualifying delays to calendar days, giving full consideration for equivalent fair weather work

days, and issue a modification in accordance with the contract clause entitled "Default (Fixed Price Construction)". (ER 415-1-5) (31 Oct 89)

1.23 SCHEDULING AND DETERMINATION OF PROGRESS
Pursuant to the contract clause, SCHEDULES FOR CONSTRUCTION CONTRACTS, the Contractor shall prepare and submit for approval a practicable project schedule. The type of schedule and detailed requirements as well as timing of this submittal shall be as specified in specification section 'PROJECT SCHEDULE'. This schedule will be the medium through which the timeliness of the Contractor's construction effort is appraised. When changes are authorized that result in contract time extensions, Contractor shall submit a modified schedule for approval by the COR. The terms of Contract Clause, SCHEDULING FOR CONSTRUCTION CONTRACTS, with reference to overtime, extra shifts, etc., may be invoked when the Contractor fails to start or complete work features or portions of same by the time indicated by the milestones dates on the approved project schedule, or when it is apparent to the COR from the Contractor's actual progress that these dates will not be met. Neither on the project schedule as originally submitted nor on any updated periodic schedules which the Contractor is required to prepare and submit, shall be actual progress to be entered include or reflect any materials which even though on the site, are not yet installed or incorporated in the work. For payment purposes only, an allowance will be made by the COR of up to 100 percent of the invoiced cost of materials or equipment delivered to the site but not incorporated into the construction, pursuant to Contract Clause, PAYMENT UNDER FIXED-PRICE CONSTRUCTION CONTRACTS. The making of such an allowance will be contingent upon a determination by the COR that the Contractor's compliance with the quality control requirements of the contract is more than satisfactory.

1.24 IDENTIFICAITON OF EMPLOYEES
The Contractor shall be responsible for furnishing to each employee and requiring each employee engaged in the work to display such identification as may be approved and directed by the COR. All prescribed identification shall be immediately delivered to the COR for cancellation upon the release of any employees. When required by the COR, the Contractor shall obtain and submit fingerprints of all persons employed or to be employed on the project. (DOD FAR Supplement 52.236-7007)

1.25 FIELD OFFICE
Field office for Contracting Officer personnel is not required.

1.26 EXCLUSION OF PERIODS IN COMPUTING COMPLETION SCHEDULES (JAN 1965)
Not Used.

1.27 QUANTITY SURVEYS (APR 1984)
Not Used.

1.28 TIME EXTENSIONS
Notwithstanding any other provisions of this contract, it is mutually understood that the time extensions for changes in the work will depend upon the extent, if any, by which the changes cause delay in the completion of the various elements of construction. The change order granting the time extension may provide that the contract completion date will be extended only for those specific elements so delayed and that the remaining contract completion dates for all other portions of the work will not be altered and may further provide for an equitable readjustment of liquidated damages under the new completion schedule. (FAR 52.212-6)

1.29 MISPLACED MATERIAL
Not Used.

1.30 SUPERINTENDENCE OF SUBCONTRACTORS (JAN 1965)

a. The Contractor shall be required to furnish the following, in addition to the superintendence required by the Contract Clause titled, "SUPERINTENDENCE BY THE CONTRACTOR."

1. If more than 50% and less than 70% of the value of the contract work is subcontracted, one superintendent shall be provided at the site and on the Contractor's payroll to be responsible for coordinating, directing, inspecting and expediting the subcontract work.

2. If 70% or more of the value of the work is subcontracted, the Contractor shall be required to furnish two such superintendents to be responsible for coordinating, directing, inspecting and expediting the subcontract work.

b. If the COR, at any time after 50% of the subcontracted work has been completed, finds that satisfactory requirement is being made, he may waive all or part of the above requirement for additional superintendence subject to the right of the COR to reinstate such requirement if at any time during the progress of the remaining work he finds that satisfactory progress is not being made.
(DOD FAR Supplement 52.236-7008)

1.31 PROCEDURES FOR SUBMISSIONS AND PAYMENT OF ALL CONTRACT PAYMENTS

In addition to the requirements contained in the Contract Clause entitled "PAYMENTS UNDER FIXED-PRICE CONSTRUCTION CONTRACTS" and to implement the requirements of the Prompt Payment Act Amendments of 1988, P.L. 100-496, the following shall apply to all payments made under this contract:

a. At the time of submission of the progress chart, the Contractor shall submit for approval by the Contracting officer or his authorized representative a breakdown of the contract work which shall be to the degree of detail required by the COR, or his representative, to effect reasonable progress payments. The Contracting Officer, or his representative, shall review this breakdown within 30 calendar days after receipt and either advise the Contractor that it is approved or disapproved, and if disapproved the reasons for disapproval. Only after the breakdown is approved shall any payment invoice be accepted from the Contractor and any payment made to him. The COR can determine if it is in the best interest of the Government to make payment without an approved breakdown; however, in no case shall more than 10% of the contract amount be paid unless the breakdown is approved.

b. The Contractor shall submit his request for payment by submission of a proper invoice to the office or person(s) designated in subparagraph c. For purposes of payment a "proper invoice" is defined as the following:

1. An estimate of the work completed in accordance with the approved breakdown indicating the percentage of work of each item and the associated costs.
2. A properly completed Eng Form 93 and 93a (where required).

3. All contractual submissions indicated elsewhere in this contract to be submitted with payment, such as updated progress schedules, updated submittal registers, etc.
4. The following certification executed by a responsible official of the organization authorized to bind the firm. A "responsible official" would be a corporate office, partner, or owner, in the case of a sole proprietorship.

I hereby certify, to the best of my knowledge and belief, that -
(a) The amounts requested are only for performance in accordance with the specifications, terms and conditions of the contract; (b) Payments to subcontractors and suppliers have been made form previous payments received under the contract and timely payments will be made from the proceeds of the payment covered by this certification, in accordance with subcontract requirements and the requirements of Chapter 39 of Title 31, Untied States Code; and (c) This request for progress payments does not include any amounts, which the prime contractor intends to withhold or retain from a subcontractor or supplier in accordance with the terms and conditions of the subcontract. (d) All required prime and subcontractor payrolls have been submitted.

_____
(Name)

_____
(Title)

_____
(Date)

c. The Government shall designate the office or person(s) who shall first receive the invoice submissions and the Contractor shall be so notified at the pre-construction conference. In addition to the designated Project Engineer, the Contractor shall at the same time submit one copy of the detailed breakdown and the Eng Form 93 to the Area Engineer.

d. The Government representative shall return any request for payment, which is deemed defective within 7 days of receipt and shall specify the defects. If the defect concerns a disagreement as to the amount of work performed and or the amount of the payment being submitted, the Government and the Contractor's representative should meet to resolve the difference and reach agreement. Upon agreement, the Contractor shall submit a new breakdown and Eng Form 93 (and 93a) and any other submissions requiring correction. These will be incorporated with the previous submittal and will then constitute a proper invoice.

e. If agreement cannot be reached, the Government shall determine the proper amount per Contract Clause, PAYMENTS UNDER FIXED-PRICE CONSTRUCTION CONTRACTS and process the payment accordingly. In this event, a "proper invoice" for Prompt Payment Act purposes will not have been submitted to the Government.

f. The Government shall pay the Contractor in accordance with the following time frames:

1. Progress Payments. From the date a "proper invoice" is received, in accordance with subparagraphs b and d of this clause, the Government will issue a check with 14 calendar days.

2. Reduction in Retainage Payment. If during the course of the contract, a reduction in retainage payment is required, the Government shall issue a check within 14 calendar days after the approval of the release to the Contractor by the Contracting Officer or his authorized representative.

3. Final Payment. A final payment request shall not be considered valid until the Contractor has fulfilled all contract requirements including all administrative items, payrolls, warranties, etc. and has submitted a release of claims. When the Contractor has fulfilled all contract requirements and a "proper invoice" has been submitted, the Government shall issue a check within 14 days from the date of acceptance of the project by the COR.

1.32 VERIFICATION OF SMALL BUSINESS UTILIZATION

a. This clause is applicable to small business concerns whose contracts exceed $1,000,000.

b. In accordance with the clause at FAR 52.219-8, entitled UTILIZATION OF SMALL BUSINESS CONCERNS AND DISADVANTAGED BUSINESS CONCERNS, in effect on the date of this contract, the Contracting Office may survey the extent of small and small disadvantaged business utilization under this contract. The contractor may be required to report to the COR statistical data on the number and dollars amounts of subcontracting awards with small business and small disadvantaged businesses.

c. As appropriate, the Contracting Officer may require one or more follow-up reports to the initial report.

d. The Contractor agrees to insert this clause in any subcontract that may exceed $1,000,000, including this subparagraph d.

1.33 HAZARDOUS MATERIAL IDENTIFICATION & MATERIAL SAFETY DATA (NOV 1991)

a. Hazardous material, as used in this clause, includes any material defined as hazardous under the latest version of Federal Standard No. 313 (including revisions adopted during the term of the contract.)

b. The offeror must list any hazardous material, as defined in (paragraph

1. The hazardous material shall be properly identified and include any applicable identification number, such as National Stock Number or Special Item Number. This information shall also be included on the Material Safety Data Sheet submitted under this contract.

Material (if none, insert NONE)

_____

_____

_____

_____

_____

Identification No.

c. The apparently successful offeror, by acceptance of the contract, certifies that the list in paragraph b of this clause is complete. This list must be updated during performance of the contract whenever the Contractor determines that any other material to be delivered under this contract is hazardous.

d. The apparently successful offeror agrees to submit, for each item as required prior to award, a Material Safety Data Sheet, meeting the requirements of 29 CFR 1910.1200(g) and the latest version of Federal Standard No. 313, for all hazardous material, identified in paragraph b of this clause. Data shall be submitted in accordance with Federal Standard No. 313, whether or not the apparently successful offeror is the actual manufacturer of these items. Failure to submit the Material Safety Data Sheet prior to award may result in the apparently successful offeror being considered non-responsible and ineligible for award.

e. If, after award, there is a change in the composition of the item(s) or a revision to Federal Standard No. 313, which renders incomplete or inaccurate the data submitted under paragraph d of this clause or the certification submitted under paragraph c of this clause, the Contractor shall promptly notify the COR and resubmit the data.

f. Neither the requirements of this clause nor any act or failure to act by the Government shall relieve the Contractor of any responsibility or liability for the safety of Government, Contractor, or subcontractor personnel or property.

g. Nothing contained in this clause shall relieve the Contractor from complying with applicable Federal, State, and local laws, codes, ordinances, and regulations (including the obtaining of licenses and permits) in connection with hazardous material.

h. The Government's rights in data furnished under this contract with respect to hazardous material are as follows:

1. To use, duplicate and disclose any data to which this clause is applicable. The purposes of this right are to:

(i) Apprise personnel of the hazards to which they may be exposed in using, handling, packaging, transporting or disposing of hazardous materials.

(ii) Obtain medical treatment for those affected by the material; and

(iii) Have other use, duplicate, and disclose the data for the Government for these purposes

2. To use, duplicate, and disclose data furnished under this clause, in accordance with subparagraph (h)(1) of this clause, in precedence over any other clause of this contract providing for rights in data.

3. The Government is not precluded from using similar or identical data acquired from other sources. (FAR 52.223-3)

1.34 SAFETY AND HEALTH REQUIREMENTS MANUAL

If this contract is for construction or dismantling, demolition, or removal of improvements with any Department of Army agency or component, the Contractor shall comply with all pertinent provisions of the latest version of U.S. Army Corps of Engineers Safety and Health Requirements Manual, EM 385-1-1, in effect on the date of the solicitation. The latest edition of the U.S. Army Corps of Engineers Safety and Health Requirements Manual, EM 385-1-1 and it changes are available at http://www.hq.usace.army.mil (at the HQ homepage select Safety and Occupational Health). Contractor shall be responsible for complying with the current edition and all changes posted on the web as of effective date of this solicitation. Before commencing the work, the Contractor shall: (1) Submit a written proposal for implementing the Accident Prevention Plan; and (2) Meet with representatives of the Contracting Officer to discuss and develop a mutual understanding relative to administration of the overall safety program. See Section 01420 SAFETY for additional safety requirements.

1.35 SPECIAL SCHEDULING REQUIREMENTS FOR MECHANICAL AND ELECTRTICAL SYSTEMS

In reference to the contract clause entitled "PAYMENTS UNDER FIXED-PRICE CONSTRUCTION CONTRACTS", see Section 01452 TESTING FOR MECHANICAL AND ELECTRICAL SYSTEMS for additional scheduling requirements for such systems.

1.36 SUBMISSION OF CLAIMS

a. The following shall be submitted to the Contracting Division at the following address: U.S. Army Corps of Engineers, New York District, 26 Federal Plaza, New York, New York 10278-0090:

1. Claims referencing or mentioning the Contracting Disputes Act of 1978

2. Requests for a written decision by the Contracting Officer

3. Claims certified in accordance with the Contract Disputes Act of 1978

b. No other Government representative is authorized to accept such requests. A copy shall also be provided to the Authorized Representative of the Contracting Officer.

c. The Contractor shall also provide the COR with a copy of any requests for additional time, money or interpretation of contract requirements which were provided to the Authorized Representative of the Contracting Officer and which have not been resolved after 90 days.

1.37 PARTNERSHIP IMPLEMENTATION PLAN

To more effectively accomplish this contract, the Government proposes to form a partnership with the Contractor. This partnership would draw on the strengths of each organization in an effort to achieve a quality product within budget and on schedule. This partnership would be bilateral in make-up and participation would be totally voluntary. The Contractor shall hire a facilitator who would be responsible to arrange for an offsite conference location, provide all workshop materials, and compile and distribute a completed partnering agreement to all participants within 30 days of the partnering session. Conference site location will be coordinated with the COR

for approval. Contractor should plan for the attendance of approximately 15-20 individuals from the Government in addition to the Contractor's and Sub-contractor's personnel. The costs associated with the partnership conference will be borne by the Contractor. It is anticipated that the partnership conference will be for one day each time and will be held on a monthly basis.

1.38 PRECONSTRUCTION CONFERENCE

a. A preconstruction conference will be arranged by the Contracting Officer, or his representative, after award of contract and before commencement of work. The Contracting Officer's representative will notify the Contractor of the time and date set for the meeting. At this conference, the Contractor shall be oriented with respect to Government procedures and line of authority, contractual, administrative, and construction matters. Additionally, a schedule of required submittals will be discussed.

b. The Contractor shall bring to this conference the following items in either completed or draft form:

1. The Contractor's order of work
2. Accident Prevention Plan
3. Quality Control Plan
4. Letter appointing Superintendent
5. List of subcontractors.

1.39 GOVERNMENT RESIDENT MANAGEMENT SYSTEM AND CONTRACTOR QUALITY CONTROL MODULE

The Government will utilize an in-house Contract Administration program entitled "Resident Management System" (RNMS). The Contractor shall utilize a Government furnished CQC Programming Module. See Section 01312 CONTROL QUALITY SYSTEM (QCS) for requirements.

1.40 DESIGN CONFERENCES

a. Pre-Work: As part of the Pre-work Conference conducted after contract award, key representatives of the Government and the Contractor will review the design submission and review procedures specified herein, discuss the preliminary design schedule and provisions for phase completion of the design build documents with construction activities (fast tracking), as appropriate, meet with the Corps of Engineers Design Review personnel and key Using Agency points of contact and any other appropriate pre-design discussion items.

b. Design Charette: After award of the contract, the Contractor shall visit the site and conduct extensive interviews, and problem solving discussions with the individual users, base personnel, Corps of Engineers personnel to acquire all necessary site information, review user operations, and discuss user needs. The Contractor shall document all discussions. The design shall be finalized as direct result of these meetings.

c. Design Review conferences: Review conferences will be held on base for each design for each submittal. The Contractor shall bring the personnel that developed the design submittal to the review conference. The conferences will take place the week after the review is complete. There shall be a minimum of Twenty-one (21) calendar days between the conclusion of any design review conference and government receipt of the next design submittal from the contractor.

1.41 TRAINING

The Contractor shall provide operational and maintenance training for all systems furnished under this contract. The training will be for the operating and maintenance personnel. The system manufacturer shall conduct the training. The training shall not take place until the operation and maintenance manuals are submitted and approved. The Contractor shall videotape training sessions on VHS tapes and provide the tapes to the Government. In addition, the contractor shall provide two (2) compact disks [digital files] of each training session that is videotaped.

1.42 CONSTRUCTION COLOR BOARD SUBMITTALS

The Contractor shall submit four sets of color boards depicting samples of all finish materials. The color board (finishes sample submittal package) shall include all visible exterior and interior materials and finishes that are a part of the structures, buildings, facilities and/or built-in items provided under this contract. The color boards shall be delivered to each of the addresses listed below in this section. The Contractor shall furnish his color board submittal to each of the addresses within 90 days after receipt of the notice to proceed, but not less than 60 days prior to ordering finishing materials. The Contractor should obtain approval of his entire color board submission before beginning any work involving final finishes. The Government shall have the option to select from all of the manufacturer's standard colors and/or finishes, unless specifically noted otherwise. The minimum number of different color and/or finish selections to be made by the Government for application to each and every individual structure, building, facility and/or built-in item shall be: three (3) ceiling paint or type, five (5) wall paint, and five (5) door paint colors, three (3) carpet, three (3) VCT and vinyl base types. Each side of each door and doorframe shall be a different color than the adjacent surface unless otherwise approved. The Contractor shall use the following format when assembling the color boards:

a. Provide the samples on 8 1/2- x 11-inch board modules with a maximum spread of 25 1/2- x 33-inches for foldouts. Label the modules with the project titles and design them to fit in a standard loose-leaf, three-post binder. The modules should support and anchor all samples. Anchor large or heavy samples with mechanical fasteners.

b. Organize the submittals in a logical manner to allow a fast review. Write descriptions and explanations clearly. Drawings and photographs must be clear and concise.

c. Organize samples by scheme with a separate scheme for each room or for groups of rooms with the same scheme. Coordinate the schemes by room names and numbers shown on the architectural floor plans and room finish and color schedule. Include floor plans and schedules in modules.

d. Indicate true pattern color and texture for interior material and finish samples. Carpet samples should be large enough to indicate a complete pattern or design, but not less than 3 by 5 inches.

e. Include color/finish pattern and texture for exterior materials and finishes.

f. Provide at least a 6 x 6-inch square sample where either interior or exterior special finishes, such as architectural concrete or prefinished textured metal panels, are required.

1.43 AFFIRMATIVE PROCUREMENT PROGRAM (Conservation & Recovery Act of 191976)
The Contractor is required to purchase up to 100% of the following recommended materials. However, the recommendations do not preclude the use of recovered materials suggested by the Contractor. The Contractor should refer to the Recovered Material Advisory Notice (RMAN) at EPA Website: www.epa.gov/cpg for specifications and manufacturers of recovered materials. The Contractor is required to rate the complete design using the SUSTAINABLE PROJECT RATING TOOL (SPiRiT) Version 1.4 (http://www.hnd.usace.army.mil/techinfo/). EPS's Recommended Recovered Materials Contents Levels for Building Materials Carpet Spec Material Total Recovered Material
Section Content (%)_____
Carpet 09680 Polyester PET 25 to 100
Insulation Fiberglass 25 to 100
Paint 09900 Reprocessed Latex 20 to 98
Flooring 09650 Rubber/Plastic 90 to 100
Structural/ General Wood/paper/gypsum 80 to 100 laminated/ & 09250 board ceiling tile
Bathroom 10160 Plastic 20 to 100
Partitions Steel 15 to 65
Signage Plastic 80 to 100
Aluminum 25

1.44 REGISTRATION OF CONTRACTOR PERSONNEL AND PRIVATELY OWNED VEHICLES
Contractor personnel shall report to Building 1136 for their ARDEC Security Badge. They must also show their drivers license, vehicle registration and insurance card in order to be issued a badge and a DoD vehicle decal. Under the provisions of ARDEC 68, Contractor must initiate a criminal background check on all employees and copy of each check provided to the Security Office in Building 1136 before badges are issued. Contractor must report all accidents to the Installation Police, in addition to the COR. Contractor must notify the Security Office (Mr. John Woelfel, 973-724-4100) prior to any building being demolished so that the locksmith can remove door lock cores from the building

1.45 WARRANTY OF CONSTRUCTION WORK

a. In addition to any other warranties in this contract, the Contractor warrants, except as provided in paragraph (1) of this clause, that work performed under this contract conforms to the contract requirements and is free of any defect in equipment, material, or workmanship performed by the Contractor or any subcontractor or supplier at any tier.

b. This warranty shall continue for a period of 1 year from the date of final acceptance of the work. If the Government takes possession of any part of the work before the acceptance, this warranty shall continue for a period of 1 year from the date the Government takes possession.

c. The Contractor shall remedy at the Contractor's expense any failure to conform, or any defect. In addition, the Contractor shall remedy at the Contractor's expense any damage to Government-owned or controlled real or personal property, when that damage is the result of:

1. The Contractor's failure to conform to contract requirements; or

2. Any defect of equipment, material, or workmanship.

d. The Contractor shall restore any work damaged in fulfilling the terms and conditions of this clause. The Contractor's warranty with respect to

work repaired or replaced will run for 1 year from the date of repair or replacement.

e. The Contracting Officer shall notify the Contractor, in writing, within a reasonable time after the discovery of any failure, defect, or damage.

f. If the Contractor fails to remedy any failure, defect, or damage within a reasonable time after receipt of notice, the Government shall have the right to replace, repair, or otherwise remedy the failure, defect, or damage at the Contractor's expense.

g. With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for work performed and materials furnished under this contract, the Contractor shall

1. Obtain all warranties that would be given in normal commercial practice.

2. Repair all warranties to be executed, in writing, for the benefit of the Government, if directed by the COR; and

3. Enforce all warranties for the benefit of the Government, if directed by the Contracting Officer.

h. In the event the Contractor's warranty under paragraph b. of this clause has expired, the Government may bring suit at its expense to enforce a subcontractor's, manufacturer's, or supplier's warranty.

i. Unless a defect is caused by the negligence of the Contractor or subcontractor or supplier at any tier, the Contractor shall not be liable for the repair of any defects of material furnished by the Government nor for the repair of any damage that results from any defect in Government-furnished material or design.

j. This warranty shall not limit the Government's rights under the Inspection and Acceptance clause of this contract with respect to latent defects, gross mistakes or fraud.

1.46 DESIGN-BUILD CONTRACT-ORDER OF PRECEDENCE

a. The contract includes the standard contract clauses and schedules current at the time of contract award. It entails (1) the solicitation in its entirety, including all drawings, cuts, and illustrations, and any amendments, and (2) the successful offeror's accepted proposal. The Contract constitutes and defines the entire agreement between the Contractor and the Government. No documentation shall be omitted which in any way bears upon the terms of that agreement.

b. In the event of conflict or inconsistency between any of the provision of this contract, precedence shall be given in the following order:

1. Betterments: Any portions of the accepted proposal which both conform to and exceed the provisions of the solicitation.
2. The provisions of the solicitation. (See also Contract Clause: SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION.)
3. All other provisions of the accepted proposal.
4. Any design products including, but not limited to, plans, specifications, engineering studies and analysis, shop drawings, equipment installation drawings, etc. Design products must conform with all provisions of the contract, in order of precedence herein.

1.47 CONSTRUCTOR'S ROLE DURING DESIGN PROCESS

The Contractor's construction management key personnel shall be actively involved during the design process to effectively integrate the design and construction requirements of this contract. In addition to the typical required construction activities, the Contractor's involvement includes, but is not limited to actions such as: integrating the design schedule into the Master Schedule to maximize the effectiveness of fast-tracking design and construction (within the limits allowed in the contract), ensuring constructibility and economy of the design, integrating the shop drawing and installation drawing process into the design, executing the material and equipment acquisition program to meet critical schedules, effectively interfacing the construction QC program with the design QC program, and maintaining and providing the design team with accurate, up-to-date redline and as-built documentation. The Contractor shall require and manage the active involvement of key trade subcontractors in the above activities.

1.48 PRE-PROPOSAL CONFERENCE AND SITE VISIT

a. A pre-proposal conference in conjunction with the RFP solicitation will be held on 1 July 2004 in Building 3002 [DPW Bldg], large conference room, Picatinny ARDEC, Picatinny, New Jersey, commencing at 10:00 am.

b. A site visit will be conducted as part of the pre-proposal conference. The proposed pre-proposal conference agenda includes:
10:00 - 11:30 am Introductions and administrative topic
11:30 am - 12:45 pm Site visit [Shuttle bus from will depart from Bldg 3002 parking lot to project site. Participants are required to ride the bus to and from the site visit]
1:00pm Shuttle bus returns from site to Bldg 3002 parking lot and concludes pre-proposal conference

c. Prospective offerors are advised that technical questions concerning the project and/or the RFP documents will neither be accepted nor responded to during the pre-proposal conference. Questions of a general nature will be responded to during the administrative topics portion of the conference upon; written receipt from offeror on forms supplied and concurrence of the Corps' Contracting Division and Office of Counsel staff present. All questions must be submitted in writing and emailed to the Contract Specialist and in accord with section h of this section. A solicitation amendment will be issued providing responses to questions received by the cut off date identified below.

d. Prospective offerors shall submit completed visitor registration and camera pass request forms, electronically and forwarded by email only (fax copies will not be accepted and/or processed), at least five (5) business days prior to the date of the Pre-Proposal Conference to Heather Durr and Timothy Moran at Heather.Durr@usace.army.mil **and** Robert.T.Moran@usace.army.mil. Visitor registration form and camera pass request form are provided within the RFP after the FORM 1442. Offerors may contact either individual confirming receipt at 973-989-0802. Offerors are reminded that fax copies of the visitor registration and/or camera pass request forms will not be accepted.

e. Prospective offerors are advised to allow at least two (2) hours prior to the Pre-Proposal Conference for processing in at Main Gate Visitor Control Center, securing camera pass from Security Headquarters (if pass requested), and arrival at building 3002 conference room. The pre-

proposal conference will begin promptly at 10:00 am and request everyone is seated by that time.

f. Visitors and/or vehicles will not be permitted access to Picatinny ARDEC without prior registration and the following: Employment Eligibility Form, INS Form I-9 (if not a US citizen). Driver's license or other type of approved photo identification. Current vehicle registration, insurance, and DMV inspection sticker. Cameras shall not be permitted without obtaining pre-approved camera passes for the camera and individuals to take photographs. The following information shall be submitted at the time the Contractor registers for the Pre-Proposal Conference: Name, Title, and company of the individual(s) being authorized to take photographs, and the make, model, serial number of the camera to be utilized.

g. There will be only one (1) site visit for all prospective offerors, which will take place immediately following the Pre-Proposal Site meeting at Picatinny ARDEC on 1 July 2004.

h. The Contractor is responsible to determine existing conditions of buildings to be renovated. All questions from bidders shall be submitted in written form and sent by email to Loretta Parris **and** Scott Helmer at Loretta.e.parris@usace.army.mil and Scott.M.Helmer@usace.army.mil. Fax copies of questions and/or hand written documents will not be accepted. Cutoff date for receipt of questions is 8 July 2004, 5:00:00 pm EST. Responses to bidders questions, received in the required format, will be issued by solicitation amendment on or about 14 Jul 2004.
-- End of Section --

WAGE DETERMINATIONS

General Decision Number: **NJ20030003** 06/04/2004

Superseded General Decision Number: NJ020003

State: New Jersey

Construction Types: Building, Heavy and Highway

Counties: Bergen, Essex, Hudson, Hunterdon, Middlesex, Morris, Passaic, Somerset, Sussex, Union and Warren Counties in New Jersey.

BERGEN, ESSEX, HUDSON, HUNTERDON (Remainder), MIDDLESEX (Remainder), MORRIS, PASSIAC, SOMERSET (Remainder), SUSSEX, UNION, & WARREN (Remainder) COUNTIES:

BUILDING CONSTRUCTION PROJECTS (does not include residential construction consisting of single family homes and apartments up to and including 4 stories,does not include Hunterdon or Somerset Counties for building construction only)

HEAVY AND HIGHWAY CONSTRUCTION PROJECTS

Modification Number	Publication Date
0	06/13/2003
1	12/19/2003
2	01/23/2004
3	02/27/2004
4	03/05/2004
5	03/19/2004
6	05/07/2004
7	06/04/2004

BOIL0028-001 08/01/2003

	Rates	Fringes
Boilermaker	$ 34.63	20.45

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* CARP0006-001 05/01/2004

BERRGEN (East of Hackensack River including but not limited to Cliffside, Coytesville, Edgewater, Fairview, Fort Lee, Grant Wood, Leonia, Palisades Park, and Ridgefield Twps), AND HUDSON (East of the Hackensack River) COUNTIES

	Rates	Fringes
Carpenter	$ 33.38	15.02
Millwright	$ 33.07	44%+.21

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* CARP0015-001 05/01/2004

BERGEN COUNTY (Remainder)

	Rates	Fringes
Carpenter	$ 33.38	15.02
Millwright	$ 33.07	44%+.21

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* CARP0031-002 05/01/2004

HUNTERDON (Starting at the South of the town of Frenchtown on the Delaware River, thence following the line in the center of the road to Bapistown to Croton to the City of Flemington to Flemington Junction to Three Bridges, tehnce following the Somerset County line Northward, all territory South of this line including the City of Flemington) AND SOMERSET (all territory South of a line beginning at Armwell on the County line to Zion to Fairview to Dutchtown to Plainsville to Bell Mead to Griggstown to the Delaware and Raritan Canal) COUNTIES

	Rates	Fringes
Carpenter	$ 33.38	15.02

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* CARP0041-002 05/01/2004

ESSEX (Millburn Twp), MIDDLESEX, MORRIS, SOMERSET (Municipalities of Greenbrook, North Plainfield, Watchung, and all communities East of King George's Road), SUSSEX AND UNION COUNTIES

	Rates	Fringes
Carpenter & Insulator	$ 33.38	15.02
Millwright	$ 33.07	44%+.21

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* CARP0099-001 05/01/2004

	Rates	Fringes
Lather	$ 33.38	15.02

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* CARP0124-001 05/01/2004

BERGEN (City of Garfield and Boroughs of Lodi and Wallington), AND PASSAIC COUNTIES

	Rates	Fringes
Carpenter	$ 33.38	15.02
Millwright	$ 33.07	44%+.21

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* CARP0399-001 05/01/2004

WARREN COUNTY

	Rates	Fringes
Carpenter & Insulator	$ 33.38	15.02
Millwright	$ 33.07	44%+.21

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* CARP1342-001 05/01/2004

ESSEX, AND HUDSON (West of Hackensack River)

	Rates	Fringes
Carpenter	$ 33.38	15.02
Millwright	$ 33.07	44%+.21

CARP1456-001 05/01/2003

	Rates	Fringes
Diver	$ 38.28	26.41
Diver Tender	$ 28.82	26.41

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* CARP2212-001 11/01/2003

BERGEN, ESSEX, HUDSON, & PASSAIC COUNTIES

	Rates	Fringes
Soft Floor Layer	$ 32.22	44%+.21

ELEC0102-001 06/02/2003

MORRIS, PASSAIC, SUSSEX, UNION, AND WARREN COUNTIES

	Rates	Fringes
Line Construction:		
Cable Splicers	$ 42.13	42.5%
Groundmen	$ 22.98	42.5%
Lineman & Equipment Operators	$ 38.30	42.5%

ELEC0102-002 06/02/2003

MORRIS, PASSAIC, SUSSEX, UNION, AND WARREN COUNTIES

	Rates	Fringes
Cable splicer	$ 42.06	43%
Electrician	$ 38.24	43%

ELEC0164-001 08/15/2000

BERGEN, ESSEX, AND HUDSON COUNTIES

	Rates	Fringes
Line Construction:		
Cable Splicer	$ 38.89	41%
Groundman	$ 20.66	41%
Lineman, Welder,X-Ray Technician, Equipment Repairman, & Equipment Serviceman	$ 34.42	41%

ELEC0164-002 06/02/2003

BERGEN, ESSEX, AND HUDSON COUNTIES

	Rates	Fringes
Cable splicer	$ 43.81	45%
Electrician	$ 38.77	45%

ELEC0262-002 08/15/1993

MIDDLESEX COUNTY (Area North and West of a line following the Philadelphia and Reading Railroad East from the Raritan River to Dismal Road, Northeast on Dismal Road to Park Avenue, North on Park Avenue to Lehigh Valley Railroad, and Northeast along that railroad to the Union County line)

	Rates	Fringes
Electrician	$ 25.92	6.09+20%

ELEC0262-006 11/30/1994

MIDDLESEX COUNTY (Area North and West of a line following the Philadelphia and Reading Railroad East from the Raritan River to Dismal Road, Northeast on Dismal Road to Park Avenue, North on Park Avenue to the Lehigh Valley Railroad, and Northeast along that railroad to the Union County line)

	Rates	Fringes
Line Construction:		
Groundmen	$ 21.06	3.76+11.7%
Linemen, Cable Splicers	$ 22.87	3.76+11.7%

ELEC0358-001 06/01/1998

MIDDLESEX COUNTY (Remainder)

	Rates	Fringes
Electrician	$ 30.26	42.75%

ELEC0358-002 06/01/1998

MIDDLESEX COUNTY (Remainder)

	Rates	Fringes
Line Construction:		
Cable Splicer	$ 33.89	43%
Certified Welder Lineman	$ 31.77	43%

Groundman & Winch
Operator.....$ 29.47 43%
Linemen, Hole Digger
Operator, Truck w/o
Winch or Pole & Steel
Hand, Truck w/o Winch,
X-ray Technician &
Equip. Repairer.....$ 30.26 43%

ELEC0456-001 06/02/2003

MIDDLESEX COUNTY (Area South and West of a line extending East from the Raritan River along the Philadelphia and Reading Railroad to Shelton Rd, South on Shelton Rd to Lincoln Hwy to Vineyard Rd to Old Post Rd, along Old Post Rd to Mill Rd, along Mill Rd to the Raritan River, along the Raritan River to South River, alopng South River to the Southern boundary of the Borough of South River, along this boundary to Cranbury South River Turnpike, along this road continuing on to Washington Rd and Maplewood Ave in Cranbury to Scott Ave, along Scott Ave to Main St, on Main St and the turnpike to Millstone River)

	Rates	Fringes
Cable splicer	$ 42.04	47%
Electrician	$ 37.20	47%

ELEC0456-002 06/03/2002

MIDDLESEX COUNTY (Area South and West of a line extending East from the Raritan River along the Philadelphia and Reading Railroad to Shelton Rd, South on Shelton Rd to Lincoln Hwy to Vineyard Rd to Old Post Rd, along Old Post Rd to Mill Rd, along Mill Rd, aloong Mill Rd to the Raritan River, along Raritan River to South River, along South River to the Southern boundary of the Borough of South RIver, along this boundary to the Cranbury South River Turnpike, along this road continuing on to Washington Rd and Maplewood Ave in Cranbury to Scott Ave, along Scott Ave to Main St, on Main St and the turnpike to Millstone River)

	Rates	Fringes
Line Construction:		
Cable Splicer	$ 38.95	45.75%
Groundmen	$ 33.98	45.75%
Linemen	$ 34.77	45.75%
Winch Operator	$ 33.98	45.75%

ELEV0001-001 01/01/2004

	Rates	Fringes
Elevator Mechanic		
Construction	$ 39.265	14.845+A+B+C
Modernization	$ 31.43	14.695+A+B+C

FOOTNOTES:
A. PAID HOLIDAYS: New Year's Day, Lincoln's Birthday, Washington's Birthday,
Memorial Day, Independence Day, Labor Day, Columbus Day, Veteran's Day, Election Day, Thanksgiving Day, and Christmas Day

B. Employee with 6 months but less than 5 years of service receive 2 weeks vacation, and 3 weeks vacaation for 5 years or more of service.

C. Employee with 6 months, but less than 5 years of sevice receive 2 weeks vacation, and 3 weeks vacation for 5 years or more of service.

ENGI0825-004 07/01/2003

	Rates	Fringes
Power equipment operators:		
GROUP 1	$ 35.64	18.15+A+B
GROUP 2	$ 35.73	18.15+A+B
GROUP 3	$ 33.34	18.15+A+B
GROUP 4	$ 30.78	18.15+A+B
GROUP 5	$ 29.25	18.15+A+B
GROUP 6	$ 27.49	18.15+A+B
GROUP 7	$ 38.00	18.15+A+B
[STEEL ERECTION]:		

FOOTNOTES:
A. PAID HOLIDAYS: New Year's Day, Washington's Birthday, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, and Christmas Day.
B. Employees receive 20% premium pay for hazardous waste work.

POWER EQUIPMENT OPERATORS CLASSIFICATIONS
[STEEL ERECTION]

GROUP 1: Cranes - (all cranes, land or floating with booms including job 140 ft. and over, above ground); derricks-(all derricks, land or floating with boom including jib 140 ft. and over, above ground).

GROUP 2: Cranes - (all cranes, land or floating with booms including jib less than 140 ft. above ground); derricks (all derricks, land or floating with booms including jib, less than 140 ft. above ground).

GROUP 3: "A" frame; cherry pickers 10 tons and under; hoists; all types hoists shall also include steam, gas, diesel, electric, air hydraulic, single and double drum, concrete, brick shaft caisson, or any other similar type hoisting machines, portable or stationary, except Chicago boom type; jacks-screw air hydraulic power operated unit console type (not hand jack or pile load test type) side booms.

GROUP 4: Aerial platform used hoist; compressor, 2 or 3 in battery; elevators or house cars; conveyors and tugger hoists; fireman; forklift; generators, 2 or 3 maintenance-utility man; rod bending machine (power); welding machines--(gas or electric, 2 or 3 in battery, including diesels); captain power boats; tug master power boats.

GROUP 5: Compressor, single, welding machine, single, gas, electric converters of any type, diesel; welding system multiple (rectifier transformer type); generator, single.

GROUP 6: Oiler staddle carrier.

GROUP 7: Helicopter pilot

ENGI0825-005 07/01/2003

	Rates	Fringes
Power equipment operators:		
GROUP 1	$ 34.50	18.15+A+B
GROUP 2	$ 33.85	18.15+A+B
GROUP 3	$ 30.71	18.15+A+B
GROUP 4	$ 29.31	18.15+A+B
GROUP 5	$ 27.49	18.15+A+B
GROUP 6	$ 36.43	18.15+A+B
OILOSTATIC MAINLINES & TRANSPORTATION PIPELINES:		

FOOTNOTES:
A. PAID HOLIDAYS: New Year's Day; Washington's Birthday, Memorial Day; Independence Day; Labor Day; Veteran's Day, Thanksgiving Day; and Christmas Day
B. Employee receives 20% premium pay for hazardous waste work.

OILOSTATIC MAINLINES AND TRANSPORTATION PIPE LINES

CLASSIFICATIONS

GROUP 1: Backhoe; cranes (all types); draglines; front-end loaders (5 yds. and over); gradalls; scooper (loader and shovel); koehring and trench machines.

GROUP 2: "A" frame; backhoe (combination hoe laoder); boring and drilling machines; ditching machine, small; ditchwitch or similar type; fork lifts; front end loaders (2 yds and over but less than 5 yds.); graders, finish (fine); hydraulic cranes, 10 tons and under (over 10 tons - crane rate applies); side booms; and winch trucks (hoisting).

GROUP 3: Backfiller; brooms and sweepers; bulldozers; compressors (2 or 3 in battery); front-end loaders (under 2 yds.); generators; giraffe grinders; graders and motor patrols; mechanic; pipe bending machine (power); tractors; water and sprinkler trucks, welder and repair mechanic.

GROUP 4: Compressor (single); dope pots (mechanical with or with out pump); dust collectors; farm tractors; pumps (4 in. suction and over); pumps (2 or less than 4 in. suction); pumps; diesel engine and hydraulic (immaterial or power); welding machines; gas or electric converters of any type, single; welding machines, gas or electric converters of any type, 2 or 3 in battery multiple welders; wellpoint systems (including installation and maintenance).

GROUP 5: Oiler, grease, gas, fuel and supply trucks and tire repair and maintenance.

GROUP 6: Helicopter-pilot.

ENGI0825-009 07/01/2003

BUILDING CONSTRUCTION PROJECTS; HEAVY, HIGHWAY, ROAD, STREET AND SEWER PROJECTS:

	Rates	Fringes
Power Equipment Operator		
GROUP 1	$ 33.87	18.15+A+B
GROUP 2	$ 32.28	18.15+A+B
GROUP 3	$ 30.37	18.15+A+B
GROUP 4	$ 28.74	18.15+A+B
GROUP 5	$ 27.03	18.15+A+B
GROUP 6	$ 35.69	18.15+A+B

FOOTNOTES:
A. New Year's Day; Memorial Day; Independence Day; Labor Day; Thanksgiving Day; Christmas Day, plus Washington's Birthday and Veterans Day.
B. Employee receives 20% premium pay for hazardous waste work.

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

GROUP 1: Autograde - combination subgrader; base metal spreader and 7 base trimmer (CMI and similar types); autograde placer, trimmer, spreader combination (CMI and similar types); autograde slipform paver (CMI and similar types); backhoe; central power plants (all types); concrete paving machines; cranes (all types, including overhead and straddle travelling type); cranes; gantry; derricks (land or floating); drillmaster, quarrymaster (down the hole drill) rotary drill; self propelled hydraulic drill; self- powered drill; dragline; elevator graders; front end loaders (5 yds. and over); gradalls; grader; raygo; locomotive (large); mucking machines; pavement and concrete breaker, i.e.; superhammer and hoe ram; pile driver; length of boom including length of leads, shall determine premium rate applicable; roadway surface grinder; scooper (loader and shovel); shovels; tree chopper with boom; trench machines.

GROUP 2: "A" frames backhoe (combination); boom attachment on loaders (rate based on size of bucket) not applicable to pipehook, boring and drilling machines; brush chopper; shreader and tree shredder; tree shedder; cableways; carryalls; concrete pump; concrete pumping system; pumpcrete and similar types; conveyors, 125 ft. and over; drill doctor including dust collector, maintenance); front end loaders (2 yds. but less than 5 yds.); graders (finisher); groove cutting machine (ride on type); header planer; hoists; (all types hoists, shall also include steam, gas, diesel, electric, air hydraulic, single and double drum, concrete brick shaft caisson, snorkel roof, and/or any other similar type hoisting machines, portable or stationary, except Chicago boom type); hoists (Chicago boom type); hydraulic cranes, 10 tons and under; hydro-axle; jacks screw air hydrualic power operated unit or console type (not hand jack or pile load test type); log skidder; pans; pavers (all concrete; pumpcrete machines; squeezecrete and concrete pumping (regardless of size); scrapers; side booms; straddle carrier; ross and similar types; winch truck (hoisting).

GROUP 3: Asphalt curbing machine; asphalt plant engineer; asphalt spreader; autograder tube finisher and texturing machine (CMI and similar types); autograde curercrete machine (CMI and similar types); autograde curb trimmer and sidewalk; shoulder; slipform (CMI and similar types); bar bending machines (power); batchers; batching plant and crusher on site; belt conveyor systems; boom type skimmer machines, bridge deck finisher; bulldozers (all); car dumpers (railroad); compressor and blower type units (used independently or mounted on dual purposes trucks, on job site or in conjunction with job site, in loading and unloading of concrete, cement, fly ash, instancrete, or similar type

materials); compressor (2 or 3) (battery); concrete finishing machines; concrete saws and cutters (ride on type); concrete spreaders; hetzel; rexomatic and similar types; concrete vibrators; conveyors; under 125 ft.; crushing machines; ditching machine; small (ditchwitch or similar type); dope pots (mechanical with or without pump); dumpsters elevators fireman; fork lifts (economobile; lull and similar types of equipment); front end loaders (1 yd. and over but less than 2 yds.); generators (2 or 3) in battery; giraffe grinders; graders and motor patrols; gunnite machines (excluding nozzle); hammer vibratory (in conjunction with generator); hoist (roof, tugger, aerial platform hoist and house cars); hoppers; Hopper doors (power operated); ladders (motorized); laddervator; locomotive; dinky type; maintenance; utility man; mechanics; mixers (except paving mixers); motor patrols and graders; pavement breakers, small; self- propelled ride on type (also maintaining compressor or hydraulic unit); pavement breaker; truck mounted; pipe bending machine (power); roller; black top; scales; power; seaman pulverizing mixer; shoulder widener; silos; skimmer machines (boom type); steel cutting machine; services and maintaning; tractors; tug captain; vibrating plants (used in conjunction with unloading); welder and repair mechanics, concrete cleaning/ decontamination machine operstor, directional boring machine, heavy equipment robotics operator/technician, master environmental maintenance technician, ultra high pressure waterjet cutting tool system operator/maintenance technician vacuum blasting machine operator/maintenance technician.

GROUP 4: Brooms and sweepers, chippers, compressor (single), concrete spreaders (small type), conveyor loaders (not including elevator graders), engines, large diesel (1620 H.P.) and staging pump, farm tractors; fertilizing equipment (operation and maintenance) fine grade machine (small type); form line graders (small type); front loader (under 1 yd.); generator (single); grease, gas, fuel and oil supply trucks; heaters (nelson or other type including propane, natural gas or flow-type units); lights; portable generating light plants; mixers; concrete small; mulching equipment (operation and maintenance) pumps (4 inch suction and over including sumbersible pumps); pumps (2 or less than 4" suction and over including sumbersible pumps); pumps (diesel engine and hydraulic) immaterial of power road finishing machines (small type); rollers; grade; fill or stone base; seeding equipment (operation and maintenance of); sprinkler and water pump trucks steam jennies and biolers, stone spreader; tamping machines vibrating ride-on; temporary heating plany (nelson or other type, including propane, natural gas or flow type units); water and sprinkler trucks; welding machines (gas, diesel, and/or electric converters of any type, single; two or three in a battery); welding systems, multiple (rectifier transformer type); wellpoint systems.

GROUP 5: Oiler.

GROUP 6: Helicopter pilot.

IRON0011-002 07/01/2002

BERGEN, ESSEX, HUDSON, HUNTERDON (Western half),MIDDLESEX (North half), MORRIS, PASSAIC, SOMERSET (North Half), SUSSEX AND UNION COUNTIES

	Rates	Fringes
Ironworkers:		
Reinforcing	$ 27.63	24.10
Structural	$ 29.53	24.10

IRON0036-003 07/01/2003

	Rates	Fringes
Ironworkers; Structural, Reinforcing and Ornamental	$ 29.95	14.02
Projects under $25 million:		

IRON0068-004 07/01/2003

HUNTERDON (Eastern half), MIDDLESEX (South half), AND SOMERSET (South half) COUNTIES

	Rates	Fringes
Ironworkers:		
Rerinforcing (Concrete Rods)	$ 26.41	23.80
Structural, Ornamental	$ 28.41	23.80

LABO0021-001 05/01/2002

	Rates	Fringes
Laborers Building Construction	$ 22.95	11.77
Class A Laborer		

Class A Laborer:Jack Hammer, Tamper,Operator of Motorized tamper and compactor, operator of hydro demolition equipment, operator of all types of motorized forklifts, operator of motor buggy, operator of conveyor, operator of bobcat,

demolition burners, nozzle operator on gunnite, scaffold builder, & mortar man (except silofed).
Class B Laborer:all laborers not listed in Class A or C
Class C Laborer:Laborers doing janitorial-type light clean-up work associated with the turnover of the project or part of a project to the owner.

LABO0072-001 05/01/2002

MIDDLESEX COUNTY (Perth Amboy, Carteret, Woodbridge, Metuchen Twps, South River, Sayreville, South Amboy, Old Bridge, East Brunswick, Spotswood, Jamesburg, Helmetta, Cranbury & Monroe Twps)

	Rates	Fringes
Laborers Building Construction	$ 22.95	11.77

Class A

Class A-Jack Hammer, Motorized Tamper & Compactor, Street Cleaning Machines, Scaffold Builders, Hydro Demolition Equipment, all types of Motorized Fork Lifts, Riding Motor Buggy Operator, Bobcat Operator, Mortar Man, & Nozzle Man on Gunnite work.

CLASS B All Laborers not listed in Class A or C.

CLASS C Laborers doing Janitorial type light clean up work associated with the turnover of the project to the owner
All Flagman, and those manning temporary heat of all types

LABO0156-002 05/01/2002

MIDDLESEX (Remainder), and SOMERSET (East Millstone and Franklin Townships) COUNTIES:

	Rates	Fringes
Laborers:	$ 22.45	11.77

Group 2

Group 1-Jack Hammers,Tampers,Motorized Tampers and Compactors,Street Cleaning Machines,Scaffold Builder,Hydro Demolition Equipment, all types of Motorized fork lifts riding Motor Buggy operator,Conveyor operator, Bobcat operator,Mortar Man,Burners, Nozzle man on gunite work, Mortar Man shall include all laborers engaged in any mode of mixing aggregate by hand or mechanical means with the exception of silo work.

Group 2-Basic laborer's rate and includes all work not included in Group 1 or Group 3

2.Group 3-Laborers doing janitorial-type clean-up work associated with the turnover of the project or part of a project to the owner.

LABO0232-001 05/01/2002

SOMERSET COUNTY (Bernardsville,Peapack, Gladstone, Far Hills, Bernards, and Bedminster Twps):

	Rates	Fringes
Laborers:		
Group 1	$ 22.95	11.77
Group 2	$ 22.45	11.77
Group 3	$ 19.16	11.77

Group 1-Jack Hammers,Tampers,Motorized Tampers and Compactors,Street Cleaning Machines,Scaffold Builder,Hydro Demolition Equipment, all types of Motorized fork lifts riding Motor Buggy operator,Conveyor operator, Bobcat operator,Mortar Man,Burners, Nozzle man on gunite work, Mortar Man shall include all laborers engaged in any mode of mixing aggregate by hand or mechanical means with the exception of silo work.

Group 2-Basic laborer's rate and includes all work not included in Group 1 or Group 3

2.Group 3-Laborers doing janitorial-type clean-up work associated with the turnover of the project or part of a project to the owner.

LABO0239-001 05/01/2002

PASSAIC COUNTY (Twps or Boroughs of Passaic, Garfield, Lodi, Wallington, Delawanna, Allwood, Athenia, Clifton to Piaget Ave, Paterson, Albion Place, Lettle Falls, Totowa, West Paterson, Wayne Hawthorne, Pompton, Haledon, West Milford, Ringwood, Bloomingdale, East Paterson to the Garfield boundary line)

	Rates	Fringes
Laborers Building Construction	$ 22.95	11.77

GROUP 1

GROUP 1-Specialist laborer classification including jack hammer, tamper, motorized tampers and compactors, street cleaning machines, scaffold builder, hydro demolition

equipment, all types of motorized fork lifts, riding motor buggy operator, conveyor operator, Bobcat operator, mortar man, burners, nozzle man on gunite work, Mortar man shall include all laborers engaged in any mode of mixing aggregate by hand or mechabical means with the exception of silo work.

GROUP 2-Basic laborer's rate and includes all work not included in GROUP 1 or GROUP 3.

GROUP 3-Laborers doing janitorial- type light clean-up work associated with the turnover of the project or part of a project to the owner.

LABO0346-001 05/01/2002

BERGEN COUNTY (Cliffside; Borough of Cliffside Park; Borough of Fort Lee South of Central Blvd; Borough of Palisades Park South of Central Blvd; Borough of Ridgefield; Borough of Edgewater; Borough of FAirview; Hackensack; City of Hackensack; Hasbrouck Heights; Little Ferry; South Hackensack; Ridgefield Park; Bogota; Teaneck Twp. West of Teaneck Rd. and South of Fort Lee Rd.; Maywood; Saddle Brook Twp; Borough of Paramus East of Sprout Brook; Borough of River Edge; New Milford; Teterboro; Bendix; Tochell Park; Englewood; City of Englewood; Borough of Dumont; Borough of Bergenfield; Borough of Palisades Park North of Central Blvd. to Edgewater; Fort Lee to the Hudson River; Borough of Fort Lee North of Central Blvd.; Twp. of Teaneck, East of Teaneck Rd. and North of Fort Lee Rd.; Borough of Leonia; Borough of Englewood Cliffs; Borough of Tenafly; Borough of Cresskill; Borough of Demarest; Borough of Closter; Borough of Oradell; Borough of Montvale; Borough of Woodcliff Lake; Borough of Park Ridge; Borough of Hillsdale; Twp. of Washington; Borough of Westwood; Borough of Emerson; Borough of Haworth; Borough of Alpine; Borough of Rockleigh; Borough of Norwood; Borough of Harrington Park; Borough of Old Tappan; Borough of Northvale; Township of Rivervale; Lyndhurst; Rutherford; East Rutherford; Wood-Ridge; Carlton; Carlstadt; North Arlington; Moonachie; Ridgewood; Village of Ridgewood; Borough of Fair Lawn; Borough of Glen Rock; Borough of Hohokus; Borough of Saddle River; Borough of Upper Saddel River; Borough of Allendale; Borough of Ramsey; Borough of Waldwick; Borough of Midland Park; Borough of Oakland; Borough of Franklin Lakes; Twp. of Wyckoff; Twp. of Hohokus; Borough of Paramus except East of Sprout Brook; and Borough of MAhwah)

	Rates	Fringes
Laborers:		
Group 1	$ 22.95	11.77
Group 2	$ 22.45	11.77
Group 3	$ 19.16	11.77

Group 1-Jack Hammers,Tampers,Motorized Tampers and

Compactors,Street Cleaning Machines,Scaffold Builder,Hydro Demolition Equipment, all types of Motorized fork lifts riding Motor Buggy operator,Conveyor operator, Bobcat operator,Mortar Man,Burners, Nozzle man on gunite work, Mortar Man shall include all laborers engaged in any mode of mixing aggregate by hand or mechanical means with the exception of silo work.

Group 2-Basic laborer's rate and includes all work not included in Group 1 or Group 3

2.Group 3-Laborers doing janitorial-type clean-up work associated with the turnover of the project or part of a project to the owner.

LABO0394-001 05/01/2002

UNION COUNTY:

	Rates	Fringes
BUILDING CONSTRUCTION		
GROUP 1	$ 22.95	11.77
GROUP 2	$ 22.45	11.77
GROUP 3	$ 19.16	11.77
LABORERS:		

GROUP 1-Specialist laborer classicication including jack hammer, tamper, motorized tampers and compactors, street cleaning machines, scafford builder, hydro demolition equipment, all types of motorized fork lifts, riding motor buggy operator, conveyor operator, Bobcat operator, mortar man, burners, nozzle men on gunite work. Mortar men shall include all laborers engaged in any mode of mixing aggregate by hand or mechanical means with the exception of silo fed.

GROUP 2-Basic laborer's rate and includes all work not included in GROUP 1 or GROUP 3.

GROUP 3-Laborers are laborers doing, janitorial-type light clean-up work associated with the turnover of the project or part of a project to the owner, and all flagman, watchman, firewatch personnel, and those manning temporary heat of all types.

LABO0472-002 03/01/2002

	Rates	Fringes
Laborers: (FREE AIR TUNNEL)		
GROUP 1	$ 27.25	12.95+A
GROUP 2	$ 23.85	12.95+A
GROUP 3	$ 23.70	12.95+A

GROUP 4.....$ 23.20 12.95+A

FOOTNOTE:
A. PAID HOLIDAYS: New Year's Day; Washington's Birthday, Memorial Day; Independence Day; Labor Day; Thanksgiving Day; Christmas Day; Presidential Election Day; and Veterans Day; provided the employee works on 3 days for the same Employer within a period of ten working days consisting of five working days before and five working days after the day upon which the holiday falls or is observed.

LABORERS CLASSIFICATIONS
[FREE AIR TUNNEL]

GROUP 1: Blasters

GROUP 2: Skilled men (including miners; drill runners; iron men mainrenance men; conveyor men; safety miners; riggers; block layers; cement finishers; rodmen; caulkers; powder Ccarrier; all other skilled men)

GROUP 3: Semi-skilled men (including chuck tenders; trackmen; nippers; brakemen; derail men; cable men; hose men; grout men; gravel men; form men; bell or signal men (top or bottom); form workers and movers; concrete workers; shaft men; tunnel laborers; all other semi-skilled men)

GROUP 4: All other top laborers

LABO0472-003 03/01/2003

	Rates	Fringes
Laborers:		
GROUP 1	$ 25.30	11.80+A
GROUP 2	$ 25.50	11.80+A
GROUP 3	$ 25.80	11.80+A
GROUP 4	$ 26.00	11.80+A
GROUP 5	$ 26.25	11.80+A
GROUP 6	$ 29.80	11.80+A
GROUP 7a	$ 28.30	11.80+A
GROUP 7b	$ 26.30	11.80+A
HEAVY AND HIGHWAY CONSTRUCTION		

FOOTNOTE:
A. PAID HOLIDAYS: New Year's Day; Washington's Birthday; Memorial Day; Independence Day; Labor Day; Thanksgiving Day; Christmas Day; Presidential Election Day; and Veteran's Day; provided the employee works on 3 days for the same Employer within a period of ten working days consisting of five working days before and five working days after the day upon which the holiday falls or is observed.

LABORERS CLASSIFICATIONS HEAVY & HIGHWAY

GROUP 1: Common laborers; landscape laborers; railroad track laborers; pitmen and dumpmen; waterproofing; rakers and tampers on cold patch work and wrapping and coating all pipe Asphalt Laborers:

GROUP 2: Powder carriers and magazine tenders; signalmen Asphalt Raker, & Asphalt Screedman

GROUP 3: Sewer pipe; laser men; conduit and duct line layers; jackhammer; chipping hammers; pavement breakers; power buggies; concrete cutters, asphalt cutters; sheet hammer and tree cutter operators; sandblasting, cutting, burning, Power Tool Operator, and such other power tools used to perform work usually done manaully by laborers

GROUP 4: Wagon drill operator; timberman; drill master

GROUP 5: Finisher; form setter; rammer; paver; gunite nozzle man and stone cutter; Catch Basin or Inlet Builder Manhole

GROUP 6: Blaster

GROUP 7a:Hazardous waste laborer required to wear level A,B, or C personal protection.

GROUP 7b:Certified laborer working a hazardous waste removal project or site at a task requiring hazardous waste related certification, but who is not working in a zone requiring level A.B. or C personal protection.

LABO0502-001 05/01/2002

ESSEX COUNTY (City of East Orange, Twps of South Orange and Maplewood, Cities of Orange and West Orange):

	Rates	Fringes
Laborers:		
Group 1	$ 22.95	11.77
Group 2	$ 22.45	11.77
Group 3	$ 19.16	11.77

Group 1-Jack Hammers,Tampers,Motorized Tampers and Compactors,Street Cleaning Machines,Scaffold Builder,Hydro Demolition Equipment, all types of Motorized fork lifts riding Motor Buggy operator,Conveyor operator, Bobcat operator,Mortar Man,Burners, Nozzle man on gunite work, Mortar Man shall include all laborers engaged in any mode of mixing aggregate by hand or mechanical means with the exception of silo work.

Group 2-Basic laborer's rate and includes all work not included in Group 1 or Group 3

2.Group 3-Laborers doing janitorial-type clean-up work associated with the turnover of the project or part of a project to the owner.

LABO0526-001 05/01/2002

MORRIS COUNTY (Remainder):

	Rates	Fringes
Laborers:		
Group 1	$ 22.95	11.77
Group 2	$ 22.45	11.77
Group 3	$ 19.16	11.77

Group 1-Jack Hammers,Tampers,Motorized Tampers and Compactors,Street Cleaning Machines,Scaffold Builder,Hydro Demolition Equipment, all types of Motorized fork lifts riding Motor Buggy operator,Conveyor operator, Bobcat operator,Mortar Man,Burners, Nozzle man on gunite work, Mortar Man shall include all laborers engaged in any mode of mixing aggregate by hand or mechanical means with the exception of silo work.

Group 2-Basic laborer's rate and includes all work not included in Group 1 or Group 3

2.Group 3-Laborers doing janitorial-type clean-up work associated with the turnover of the project or part of a project to the owner.

LABO0569-001 05/01/2002

HUNTERDON AND WARREN COUNTIES:

	Rates	Fringes
Laborers Building Construction	$ 22.95	11.77

CLASS A

DEFINATION OF LABORERS:

CLASS A-Jack Hammer, Tamper, Motorized Tampers and Compactors, Street Cleaning Machines, Scaffold Builder, Hydro Demolition Equipment, All types of Motorized Fork Lifts, Riding Motor Buggy Operator, Bobcat Operator, Mortar Man, Burners, Nozzle Man on Gunite work.

CLASS B-All Laborers not listed in Class A or C.
CLASS C-Laborers doing Janitorial- type light clean up work associated with the turnover of the project to the owner All Flagman, and those manning tempory heat of all types.

LABO0694-001 05/01/2002

ESSEX COUNTY (Montclair):

	Rates	Fringes
Laborers:		
Group 1	$ 22.95	11.77
Group 2	$ 22.45	11.77
Group 3	$ 19.16	11.77

Group 1-Jack Hammers,Tampers,Motorized Tampers and Compactors,Street Cleaning Machines,Scaffold Builder,Hydro Demolition Equipment, all types of Motorized fork lifts riding Motor Buggy operator,Conveyor operator, Bobcat operator,Mortar Man,Burners, Nozzle man on gunite work, Mortar Man shall include all laborers engaged in any mode of mixing aggregate by hand or mechanical means with the exception of silo work.

Group 2-Basic laborer's rate and includes all work not included in Group 1 or Group 3

2.Group 3-Laborers doing janitorial-type clean-up work associated with the turnover of the project or part of a project to the owner.

LABO0711-001 05/01/2002

MORRIS COUNTY (Morristown, Morris Twp., Morris Plains,Mendham, Ralston, Chester, Brookside, Flanders, Ironia, Mount Freedom, Mount Tabor, Parsippany, Troy Hills, Pine Brook,Ced Knools, Whippany, Hanover Twp. and Long Valley):

	Rates	Fringes
Laborers:		
Group 1	$ 22.95	11.77
Group 2	$ 22.45	11.77
Group 3	$ 19.16	11.77

Group 1-Jack Hammers,Tampers,Motorized Tampers and Compactors,Street Cleaning Machines,Scaffold Builder,Hydro Demolition Equipment, all types of Motorized fork lifts riding Motor Buggy operator,Conveyor operator, Bobcat operator,Mortar Man,Burners, Nozzle man on gunite work, Mortar Man shall include all laborers engaged in any mode of mixing aggregate by hand or mechanical means with the

exception of silo work.

Group 2-Basic laborer's rate and includes all work not included in Group 1 or Group 3

2.Group 3-Laborers doing janitorial-type clean-up work associated with the turnover of the project or part of a project to the owner.

LABO0779-002 05/01/2002

SOMERSET COUNTY (Bridgewater,Branchburg, Raritan, Bound Brook, Somerville, Manville, Hillsboro, Millstone, Montgomery and Rocky Hill Twp.):

	Rates	Fringes
Laborers:		
Group 1	$ 22.95	11.77
Group 2	$ 22.45	11.77
Group 3	$ 19.16	11.77

Group 1-Jack Hammers,Tampers,Motorized Tampers and Compactors,Street Cleaning Machines,Scaffold Builder,Hydro Demolition Equipment, all types of Motorized fork lifts riding Motor Buggy operator,Conveyor operator, Bobcat operator,Mortar Man,Burners, Nozzle man on gunite work, Mortar Man shall include all laborers engaged in any mode of mixing aggregate by hand or mechanical means with the exception of silo work.

Group 2-Basic laborer's rate and includes all work not included in Group 1 or Group 3

2.Group 3-Laborers doing janitorial-type clean-up work associated with the turnover of the project or part of a project to the owner.

LABO0913-001 05/01/2002

MORRIS (Jefferson, Rockaway, Mount Arlington, Rockaway Borough, Wharton, Mine Hill, Dover, Netcong, Roxbury, Mount Oliver, Randloph, Boonton, Boonton Twp.,Montville, Lincoln Park Borough, Butler, Kinnelon Borough, Pin Brook, Towaco, Danville, Mountain Lakes, Pequannock, Pompton Plains, Riverdale Borough Twps) AND SUSSEX COUNTIES

	Rates	Fringes
Laborers Building Construction	$ 22.95	11.77

Class A Laborer:

Class A Laborer:Jack Hammer,tamper, motorized tampers and compactors, street cleaning machines, scaffold builder, hydro demolition equipment, all types of motorized fork lifts, bobcat operator, riding motor buggy operator, conveyor operator mortar man (except silo feed operations), burners, & nozzle man on gunnite work.

Class B Laborer:All laborers not listed in Class A.

Class C Laborer:Laborers doing Janitorial type light clean up work, associated with the turnover of the project to the owner All Flagman, and those manning temporary heat of all types.

LABO1030-001 04/01/2001

LABORERS: (The removal, abatement, enclosure and decontamination of personal protective equipment, chemical protective clothing and machinery relating to asbestos and/or toxic and hazardous waste of materials which shall include but not necessarily be limited to: the erection, moving, servicing and dismantling to all enclosures, scaffolding, barricades, and the operation of all tools and equipment normally used in the removal or abatement of asbesots and toxic and hazardous waste or materials, the labeling, bagging, cartoning, crating, or other packaging of materials for disposal; and the clean up of the work site and all other work incidental to the removal, abatement, encapsulation, enclosure, and decontamination of asbestos or toxic and hazardous waste materials; and in addition, all work tasks involved in the maintenance and operation of energy resource recover plants (co- generation plants).)

	Rates	Fringes
Laborer	$ 21.85	10.12

LABO1153-001 05/01/2002

	Rates	Fringes
Laborers:		
Group 1	$ 22.95	11.77
Group 2	$ 22.45	11.77
Group 3	$ 19.16	11.77

Group 1-Jack Hammers,Tampers,Motorized Tampers and Compactors,Street Cleaning Machines,Scaffold Builder,Hydro Demolition Equipment, all types of Motorized fork lifts riding Motor Buggy operator,Conveyor operator, Bobcat operator,Mortar Man,Burners, Nozzle man on gunite work,

Mortar Man shall include all laborers engaged in any mode of mixing aggregate by hand or mechanical means with the exception of silo work.

Group 2-Basic laborer's rate and includes all work not included in Group 1 or Group 3

2.Group 3-Laborers doing janitorial-type clean-up work associated with the turnover of the project or part of a project to the owner.

PAIN0711-002 05/01/2000

	Rates	Fringes
Painters:		
NEW:		
Bridge	$ 31.25	2.55+27%
Painters	$ 28.75	2.55+27%
Paperhangers	$ 28.75	2.55+27%
Spray,Sandblast,High Work	$ 31.25	2.55+27%
REPAINT:		
Painters	$ 22.00	2.55+27%
Spray,sandblast,High Work	$ 24.00	2.55+27%

PAIN0711-003 05/01/2000

	Rates	Fringes
Glazier	$ 28.75	10.30
Glaziers- High Work	$ 29.75	10.30

PAIN0711-006 08/01/1999

	Rates	Fringes
Drywall Finisher/Taper	$ 28.25	11.23

PLAS0008-006 11/01/2001

HUNTERDON,MIDDLESEX,& SOMERSET COUNTIES:

	Rates	Fringes
Plasterer	$ 28.50	13.40

PLAS0029-001 05/01/2003

BERGEN,ESSEX,HUDSON,MORRIS,PASSAIC,SUSSEX, UNION & WARREN COUNTIES:

	Rates	Fringes
Cement Masons & Plasterers.....	$ 31.00	12.50

PLUM0009-001 03/01/2004

	Rates	Fringes
Air Conditioning & Refrigeration Mechanic.....	$ 26.92	11.33+A

Installation of refrigeration equipment for any type of building where the combined compressor tonnage does not exceed 5 tons, Installation of water-cooled air conditioning that does not exceed 10 tons (includes the piping of compenent system and the erection ofthe water tower), Installation of air-cooled air conditioning that does not exceed 15 tons

FOOTNOTE: A. Paid Holidays: New Year's Day, Washington's Birthday, Memorial Day, Independence Labor Day, Thanksgiving Day, Christmas Day, plus Washington's Birthday and Veterans Day.

PLUM0009-002 07/01/2003

HUNTERDON (Remainder), MERCER,MIDDLESEX (Excluding Dunellen,Borough, East Bound Brook, Middlesex, New Market, Oak Tree, Piscataway Twp and South Plainfield), AND SOMERSET (Remainder) COUNTIES

	Rates	Fringes
Plumbers and Pipefitters.....	$ 36.88	17.00

PLUM0014-002 11/01/2003

BERGEN, HUDSON (Bayonne, Guttenberg, Hoboken, Jersey City, North Bergen, Secaucus, Union City, Weehawken, West New York), MORRIS (From Mount Olive straight across Randolph down to the Essex border), PASSAIC, SUSSEX, AND WARREN (Northern half) COUNTIES

	Rates	Fringes
Plumber.....	$ 37.56	17.29

PLUM0024-001 05/01/2003

Essex:

HUDSON (East Newark,Harrison,& Kearney only);

HUNTERDON (Alexandria, Alexandria Twp., Alexauken, Allens Corner, Allerton, Amsterdam, Annadale, Anthony, Baptistown, Bellewood, Bethlehem, Twp., Bissell, Bloomsbury, Bunnvale, Bottonwood Corners, Centerville, Charlestown, Cherryville, Clinton, Clinton Twp., Cokebury, Coles Mills, Croton, Delaware Twp., Dilts Corner East Amwell Twp., Everittstown, Fairmount, Farmersville, Franklin Twp., Frenchtown, Glen Gardner, Grandin, Hamden, Hampton, Higginsville, High Bridge, Hoffmans, Holland Twp., Highesville, Johnsons, Jutland, King, Kingwood Twp., Klinesville, Landsdowne, Lebanon, Lebanon Twp., Little Brook, Little Neck, Little York, Ludlow, McPherson, Milford, Moutainville, Mount Joy, Mount Pleasant, North Salem, Muirshead, New Germantown, New Hampton, Newport, Norton, Oak Grove, Oldwick, Palmyra, Palmyra Corners, Pattenburg, Perryville, Pittstown, Pleasant Run, Polktown, Potterstown, Quakertown, Raritan Twp., Readington, Readington Twp., Reaville, Rileyville, Riverside, Rockafellows, Rowland Mills Sidney, Snydertown, Spring Mills, Stanton, Stanton Station Sunnyside, Sutton, Tewksbury, Tewksbury Twp.,The Point, Three Bridges, Treasure Island, Tumble, Union, Union Twp., Unionville Van Syckle, Warren Paper Mills, Wertsville, West End, West Portal White House, Whitehouse Station, Woodglen).

MIDDLESEX (Dunellen Borough, East Bound Brook, Middlesex, New Market, Oak Tree, Piscataway Twp., & South Plainfield only).

MORRIS (Bartley, Berkshire Valley, Bertland Island, Brookside, Chatham, Chatham Twp., Chester, Chester Twp., Cooks Bridge, Crestmoore, Gillette, Harding Twp., Ironia, Logansville, Long Valley, Malapardis, Mendham, Mendham Twp., Middle Valley, Millington, Milltown, Milton, Mount Freesom, Mount Olive Twp.,Mount Paul, Myerstown, Maughright, New Vernon, Parker, Passaic Twp, Pleasant Grove, Ralston, Schooleys, Mount Stanley, Stephensonburg, Stirling, & Washint Twp.)

SOMERSET (Amwell, Basking Ridge, Bedminster, Bedminster Twp., Bernards Twp., Bernardsville, Blaziers Corner, Bound Brook, Bradley Gardens, Branchburg Twp., Bridgewater Twp., Burnt Mill, Centerville, Chimney Rock, Claver Hill, Dutchtown, Far Hills Borough, Finderne, Flagstown, Frank Fort, Franklin Park, Franklin Twp., Gallia, Gladstone, Greater Cross Roads, Hamilton, Harmony, Harmony Colony, Higgins Mills, Hillsborough Twp., Lamington, Lanes Crossing, Liberty Corners, Lyons, Madisonville, Manville, Manville Borough, Martinsville, Mettler, Millstone, Mine Brook, Montgomery, Montgomery Twp., Mount Bethel, Mount Horeb, Neshanic, Neshanic Station, North

Branch, North Branch Depot, North Plainfield, Peapack, Peapack-Gladstone, Plainville Plukemin, Pottersville, Raritan, Ravine Lake, Rock Mill, Round Top, Roycefield, Royce Valley, Seeley Mills, Smalleytown, Somerset, Somerville, Stone House, Sunset Lake, Union Village, Vliettown, Watchung, West Millington, Weston, White Bridge, Woodfern, Zarepat, & Zion).

UNION &

WARREN (Anderson, Asbury, Beattystown, Brainards, Brass Castle, Broadway, Buttzville, Carpetersville, Changewater, Cornish, Finesville, Foul Rift, Franklin Twp., Greenwich Twp., Harmony, Harmony Station, Harmony Twp., Haszen, Hope Twp., Hutchinson, Karrville, Kennedy, Lopatconq, Lopatconq Twp., Lower Harmony, Mansfield Twp., Montana, New Village, Oxford, Oxford Twp.,Pequest, Pleasant Valley, Port Colden, Port Murray, Riegelsville, Rockport, Rocksbury, Roxburgh, Springtown, Stewartsville, Still Valley, Vulcanite, Warren Glen, Washington, Washington Twp., White Top, & Phillipsburg Twp.) COUNTIES:

	Rates	Fringes
Plumber (Excludes Somerset-Bldg).....	$ 37.28	16.45

PLUM0274-002 05/01/2003

BERGEN, HUDSON, MORRIS (Remainder), PASSAIC, SUSSEX, AND WARREN (Remainder) COUNTIES

	Rates	Fringes
Pipefitter.....	$ 36.89	17.24

PLUM0475-001 05/01/2003

ESSEX; HUNTERDON (Alexandria, Alexandria Twp, Alexauken, Allens Corner, Allertown, Amsterdam, Annandale, Anthony, Baptistown, Bellewood, Bethlehem Twp, Bissell, Bloomsbury, Bunnvale, Buttonwood Corners, Centerville, Charlestown, Cherryville, Clinton, Cokebury, Coles Mills, Croton, Delaware Twp, Dilts Corner, East Amwell Twp, Evittstown, Fairmount, Farmersville, Franklin Twp, Frenchtown, Glen Gardner, Grandin, Hamden, Hampton, Higginsville, High Bridge, Hoffmans, Holland Twp, Hughesville, Johnsons, Jutland, King, Kingwood Twp, Klinesville, Landsdowne, Lebanon, Lebanon Twp, Little Brooke, Little Neck, Little York, Ludlow, McPherson, Milford, Mountainville, Mount Joy, Mount Pleasant, Mount Salem, Muirshead, New Germantown, New Hampton, Newport, Norton, Oak Grove, Oldwick, Palmyra, Palmyra Corners, Pattenburg,

Perryville, Pittstown, Pleasant Run, Polktown, Potterstown, Quakertown, Raritan Twp, Readington Twp); AND WARREN (Phillipsburg Twp) COUNTIES

	Rates	Fringes
Pipefitter	$ 35.47	19.33

ROOF0004-002 06/01/2002

ESSEX; HUDSON (West of the Hackensack River); MIDDLESEX (Remainder); MORRIS; SOMERSET (Remainder) SUSSEX; UNION; AND WARREN COUNTIES

	Rates	Fringes
Roofers:		
Roofer, Composition, Damp & Waterproofing, Slate & Tile	$ 29.57	12.75

ROOF0004-003 11/27/1994

HUNTERDON COUNTY:

	Rates	Fringes
Roofers:		
All other work	$ 21.95	6.53 + A
Shingle, slate and tile	$ 14.25	3.02

FOOTNOTE:
A. Employer contribution of $509.60 per month per employee to Health and Welfare Funds.

ROOF0008-004 07/01/2002

HUDSON COUNTY (Remainder)

	Rates	Fringes
Roofers:		
Roofers, Composition, Damp and Waterproofing	$ 30.08	18.78

ROOF0010-001 06/01/2002

BERGEN AND PASSAIC COUNTIES

	Rates	Fringes
Roofer, Composition.....	$ 30.25	10.30

SFNJ0669-001 04/01/2004

HUNTERDON; MIDDLESEX (Remainder); AND WARREN COUNTIES

	Rates	Fringes
Sprinkler Fitter.....	$ 35.55	6.15

SFNJ0696-001 07/01/2002

BERGEN, ESSEX, HUDSON, MIDDLESEX (New Brunswick, Milltown, Old Bridge, Browntown and North thereof),MORRIS, PASSAIC, SOMERSET (Bernardsville, Basking Ridge, Mine Brook, Far Hills, Lyons, Mount Bethel, Watchung, North Plainfield Martinville and Somerville), AND UNION COUNTIES

	Rates	Fringes
Sprinkler Fitter.....	$ 38.70	10.50

SHEE0019-014 06/01/2003

WARREN COUNTY:

	Rates	Fringes
Sheet metal worker.....	$ 24.57	17.09

SHEE0025-001 06/01/2000

BERGEN, ESSEX, HUDSON, MORRIS, PASSAIC, SOMERSET, SUSSEX, & UNION COUNTIES

	Rates	Fringes
Sheet metal worker.....	$ 26.92	16.12

SHEE0027-001 01/01/2004

HUNTERDON & MIDDLESEX COUNTIES:

	Rates	Fringes
Sheet metal worker.....	$ 34.20	21.10

TEAM0408-001 05/01/1997

ESSEX, MORRIS, AND UNION (Remainder) COUNTIES

	Rates	Fringes
Truck drivers:		
GROUP 1	$ 24.45	7.01+A
GROUP 2	$ 24.50	7.01+A
GROUP 3	$ 24.60	7.01+A
GROUP 4	$ 24.70	7.01+A

FOOTNOTE:
A. Premium pay for hazardous waste removal: additional $3.00 per hour if suite-up, otherwise $1.00 per hour additional.
Paid Holidays: New Year's Day, Washington'd Birthday, Memorial Day, Independence Day, Labor Day, Veteran's Day, Election Day, Thanksgiving Day, and Christmas Day, provided the employee has been assigned to work or "shifts" one day of the calendar week during which the holiday falls. Employer contribution of $663.57 per month per employee to Health & Welfare Funds.

TRUCK DRIVERS CLASSIFICATIONS

GROUP 1: Drivers on the following type vehicles: Straight dumps, flats, floats, pickups, container haulers, fuel, water sprinkler, road oil, stringer, bead, hot pass, bus dumpcrete, transit mixers, agitator mixer, half truck, witch truck, side-o-matic, dynamite, powder, x-ray, welding, skid, jeep, station wagon, stringer, a-frame, all dual purpose trucks, trucks with mechanical tailgates, asphalt distributor, batch trucks, seeding, mulching, fertilizer, air compressor trucks (in transit), parts chaser, escort, scissor, hi-lift, telescope, concrete breaker, gin pole, stone, sand, asphalt distributor and spreader, nipper, fuel trucks (drivers on fuel trucks including handling of hose and nozzle - entire unit), team drivers, vacuum or vac-all trucks (entire unit), skid truck (debris container - entire unit), concrete mobile trucks (entire unit), expediter (parts chaser), beltcrete trucks, pumpcrete trucks, line truck, reel truck, wreckers, utility trucks, tack trucks, warehousemen, warehouse parts-men, yardmen, lift truck in warehouse, warehouse clerk, parts man, material checker, receivers, shippers, binning men (materials), cardex man, drivers on the following type vehicles: broyhill coal tar epoxy trucks, little ford bituminous distributor, slurry seal truck or vehicle, thiokol track master pickup (swamp cat pickup); bucker loader dump truck and any rubber-tired tractor used in pulling and towing farm wagons and trailers of any description, similar type

vehicles, off-site and on-site repair shop

GROUP 2: Drivers on straight 3-axle materials: trucks and floats

GROUP 3: Drivers on all euclid type vehicles: euclids, international harvestors, wabcos, caterpillar, koehring, tractors and wagons, dumpsters, straight, bottom, rear and side dumps, carry-alls and scrapers (not self-loading, loading over the top); water sprinkler trailers; water pulls and similar types of vehicles; drivers on tractors and trailer type vehciles: flat, floats, I-beams, low beds, water sprinkler, bituminous transit mix, road oil, fuel, bottom dump hopper, rear dump, office, shanty, epoxy, asphalt, agitator mixer, mulching, stringer, seeding, fertilizing pole, spread, bituminous distributor, water pulls (entire unit) (tractor trailer), reel trailer, and similar types of vehicles

GROUP 4: Winch trailer drivers

TEAM0469-001 05/01/2000

HUNTERDON, MIDDFLESEX, SOMERSET, UNION (up to Wood Avenue South of Cranford), AND WARREN COUNTIES

	Rates	Fringes
Truck drivers:		
GROUP 1	$ 26.35	11.835+A
GROUP 2	$ 26.40	11.835+A
GROUP 3	$ 26.50	11.835+A
GROUP 4	$ 26.60	11.835+A

FOOTNOTE:
A. PAID HOLIDAYS: New Year's Day, Memorial Day, Independence Day, Labor Day, Thaknsgiving Day, Christmas Day, plus Washington's Birthday, Election Day and Veteran's Day, provided that the employee has been assigned to work or "SHIFTS" one day of the calendar week during which the holiday falls.
$400.00 per year to Apprenticeship Training Fund.
$3.00 per hour premium pay for hazardous waste work.

TRUCK DRIVERS CLASSIFICATIONS

GROUP 1: Drivers on the following type vehicles: straight dumps, flats, floats, pickups, conatiner haulers, fuel, water sprinkler, road oil, stringer, bead, hot pass, bus dumpcrete, transit mixers, agitator mixer, half truck, winch truck, side-o-matic, dynamite, powder, x-ray, welding, skid, jeep, station wagon, stringer, A-frame, all dual purpose trucks,

trucks with mechanical tailgates, asphalt distributor, batch trucks, seeding, mulching, fertilizer, air compressor trucks (in transit), parts chaser, escort, scissor, hi-lift, telescope, concrete breaker, gin pole, stone, sand, asphalt distributor and spreader, nipper, fuel trucks (drivers on fuel trucks including handling of hose and nozzle - entire unit), team drivers, vacuun or vac-all trucks (entire unit), skid truck (debris contained - entire unit), concrete mobile trucks (entire unit), expediter (parts chaser), beltcrete trucks, pumpcrete trucks, line truck, reel truck, wreckers, utility trucks, tack trucks, warehousemen, warehouse parts-men, yardmen, lift truck in warehouse, drivers on the following type vehciles: Broyhill coal tar epoxy trucks, little ford bituminous distributor, slurry seal truck or vehicle, thiokol track master pickup (swamp cat pickup); bucket loader dump truck and any rubber-tired tractor used in pullind and towing farm wagons and trailers of any description, similar type vehicles, off-site and on-site repair shop

GROUP 2: Drivers on straight 3-axle materials: trucks and floats

GROUP 3: Drivers on all euclid type vehicles: euclids, international harvesters, wabcos, caterpillar, koehring, tractors and wagons, dumpsters, straight, bottom, rear and side dumps, carry-alls and scrapers (not self-loading, loading over the top); water sprinkler trailers; water pulls and similar types of vehicles; drivers on tractors and trailer type vehicles: flat, floats, I-beams, low beds, water sprinkler, bituminous transit mix, road oil, fuel, bottom dump hopper, rear dump, office, shanty, epoxy, asphalt, agitator mixer, mulching, stringer, seeding, fertilizing pole, spread, bituminous distributor, water pulls (entire unit) (tractor trailer), reel trailer, and similar types of vehciles

GROUP 4: Winch trailer drivers

TEAM0560-001 05/01/1997

BERGEN, HUDSON AND PASSAIC COUNTIES

	Rates	Fringes
Truck drivers:		
GROUP 1	$ 24.45	8.08+A
GROUP 2	$ 24.50	8.08+A
GROUP 3	$ 24.60	8.08+A
GROUP 4	$ 24.70	8.08+A

FOOTNOTE:
A. PAID HOLIDAYS:New Year's Day, Washington's Birthday,

Memorial Day, Independence Day, Labor Day, Presidential Election Day, Veteran's Day, Thanksgiving Day, Christmas Day.$3.00 per hour premium pay for hazardous work.

TRUCK DRIVERS CLASSIFICATIONS

GROUP 1: Drivers on the following type vehicles: straight dumps, flats, floats, pickups, container haluers, fuel, water sprinkler, road oil, stringer, bead, hot pass, bus dumpcrete, transit mixers, agitator mixer, half truck, winch truck, side-o-matic, dynamite, powder, x-ray, welding, skid, jeep, station wagon, stringer, A-frame, all dual purpose trucks, trucks with mechanical tailgates, asphalt distributor, batch trucks, seeding, mulching, fertilizer, air compressor trucks (in transit), parts chaser, escort, scissor, hi-lift, telescope, concrete breaker, gin pole, stone, sand, asphalt distributor and spreader, nipper, fuel trucks (drivers on fuel trucks including handling of hose and nozzle - entire unit), team drivers, vacuum or vac-all trucks (entire unit), skid truck (debris container - entire unit), concrete mobile trucks (entire unit), expediter (parts chaser), beltcrete trucks, pumpcrete trucks, line truck, reel truck, wreckers, utility trucks, tack trucks, warehousemen, warehouse parts-men, yardmen, lift truck in warehouse, warehouse clerk, parts man, material checker, receivers, shippers, binning men (materials), cardex man, drivers on the following type vehicles: broyhill coal tar epoxy trucks, little ford bituminous distributor, slurry seal truck or vehicle, thiokol track master pickup (swamp cat pickup); bucket loader truck and any rubber- tired tractor used in pulling and towing farm wagons and trailers of any description, similar type vehicles, off-site and on-site repair shop

GROUP 2: Drivers on straight 3-axle materials: trucks and floats

GROUP 3: Drivers on all euclid type vehicles: euclids, international harvestors, wabcos, caterpillar, keohring, tractors and wagons, dumpsters, straight, bottom, rear and side dumps, carry-alls and scrapers (not self-loading, loading over the top); water sprinkler trailers; water pulls and similar types of vehicles; drivers on tractors and trailer type vehicles: flat, floats, I-beams, low beds, water sprinkler, bituminous transit mix, road oil, fuel, bottom dump hopper, rear dump, office, shanty, epoxy, asphalt, agitator mixer, mulching, stringer, seeding, fertilizing pole, spread, bituminous distributor, water pulls (entire unit) (tractor trailer), reel trailer, and similar types of vehicles

GROUP 4: Winch trailer drivers

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.
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Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

In the listing above, the "SU" designation means that rates listed under the identifier do not reflect collectively bargained wage and fringe benefit rates. Other designations indicate unions whose rates have been determined to be prevailing.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

SECTION 01010

DESIGN REQUIREMENTS

TABLE OF CONTENTS

PART NUMBER and TITLE

1 PROJECT DESCRIPTION AND GENERAL REQUIREMENTS

2 CIVIL AND LANDSCAPE-SITE DEVELOPMENT

3 GEOTECHNICAL DESIGN

4 ARCHITECTURAL DESIGN

5 STRUCTURAL DESIGN

6 MECHANICAL DESIGN

7 ELECTRICAL DESIGN

8 TELECOMMUNICATIONS DESIGN

9 ENVIRONMENTAL DESIGN

10 EXPLOSIVE SAFETY DESIGN

11 SPECIFICATIONS

PART 1 PROJECT DESCRIPTION and GENERAL REQUIREMENTS

1.1 PROJECT DESCRIPTION

This request for proposal solicitation package (RFP) provides parameters for the design and construction of an Explosive Research & Development Loading Facility (ERDLF) to be located at Armament, Research, Development & Engineering Center (ARDEC), Picatinny, New Jersey.

The EDRLF will provide a cost effective, efficient, state of the art fabrication, characterization and test facility, where new ingredients, new formulations, and propulsion charge designs can be evaluated in support of the US Army's future and legacy systems.

The ERDLF shall be composed of the following four primary functional components: (1) Administration Office, (2) Explosives Processing Bays, (3) Explosives Machining Bays, and (4) Explosives Storage Magazine. In addition to the primary functional areas listed above additional design and construction is required for covered and enclosed connecting walkways linking the main functional components of the ERDLF.

The ERDLF shall be sited within the controlled access zone of Area 200. ERDLF siting shall maintain a 400-foot clear construction and construction related activity separation distance from the existing building #225 and shall be positioned between the existing Phipps Road and 5th Avenue. Siting of this facility shall also maintain a clear separation of 50 feet from the adjacent wetlands area.

All buildings and explosive storage facilities shall be designed and constructed in accordance with the Picatinny Arsenal Installation Design Guide, USACE Technical Instruction TI 800-01 Design Criteria, and explosive and safety requirements in accordance with DA Pamphlet 385-64, AMC-R 385-100 as well as other design references described in the remainder of this RFP.

In addition to the primary functional facilities this design shall also include storm and sanitary sewers, potable water, electric service, fire protection and alarm systems, deluge fire suppression system, paving, lighting, information systems, contaminated water control system and site improvements. Heating source shall be district steam.

Site development includes utilities, drainage, paving for parking, service road improvement, sidewalks, contaminated water containment and removal system and concrete dumpster pads.

The site condition shall be in a roughly graded condition following demolition of existing facilities in preparation for this project. Existing demolition work is not part of the scope of work for this RFP and shall be the responsibility of the local Installation.

Care should be taken by the Contractor to preserve and mark all underground utilities for future reuse consideration.

The ERDLF will be located at the west of Phipps Road at the bottom of the ridgeline at ARDEC, Picatinny, New Jersey (see Civil Site drawing).

1.2 DESIGN SUBMITTAL REQUIREMENTS

See Section 01012 DESIGN AFTER AWARD.

1.2.1 STANDARDS, DOCUMENTS, AND CRITERIA

The design requirements within Section 01010 represent the minimum quality and quantity acceptable for the proposals and projects submittals. The standards, documents, and criteria referenced within this RFP, although not all attached within this RFP document, are modified to the extent indicated within this section. The Contractor shall be responsible for obtaining any documents not attached as part of this RFP but referenced as criteria for the project. Requirements of this section may delete, revise, add to, or substitute for criteria contained in the referenced documents and Section 01010, DESIGN REQUIREMENTS.

1.2.2 DESIGN STANDARDS

The project shall be designed and constructed in accordance with the Army Installation Design Standards http://www.mantech-mec.com:8500/army_ids/index.cfm , New York District Corps of Engineers (NYCOE) Manual of Standard Design Procedures, Picatinny Arsenal Installation Design Guide (IDG), DA Pamphlet 385-64, Ammunition and Explosives Safety Standards, AMC-R 385-100, Unified Facilities Guide Specifications (UFGS), the UFGS associated references, as well as all other Standards, Codes and Attachments referenced within the Solicitation. The design and construction shall comply with DA PAM 385-64 and AMC-R 385-100 in relation to lightning protection and accidental blast protection. Equipment, hardware, and materials shall be standard manufactured items unless otherwise specified. Replacement parts shall be standard and readily available through commercial means. Discontinued products will not be accepted unless approved by the Contracting Officer.

1.2.3 CODES

The design, materials, equipment, and installation shall be in accordance with the requirements of the listed codes and design manuals, with the requirements of this section, and with the listed specifications.

1.2.4 ENGLISH UNIT DESIGN

This project shall be designed in the English Inch-Pound Unit System (I-P) with metric units in parentheses (m).

1.2.5 EXISTING AS-BUILT DRAWINGS

As-built drawings are provided for building #225. These drawings are provided as a general reference only for the offerors preparation of work related to Option 1. Information provided on the as-built drawings included in this RFP shall be verified by the Contractor. The Contractor shall develop his design based on these requirements and codes and regulations. All of the drawings are available in electronic file format (Microstation).

1.2.5.1 FIELD INFORMATION

The utility information provided in the drawings is the best information available. It is provided to assist the Contractor during the design of this project. The Contractor is responsible for field verifying all information given. The Contractor is responsible for obtaining all information during design and requests for information shall be coordinated through the Contracting Officer. Any survey required to provide utility locations, manhole inverts, and verification of existing features, etc. shall be the responsibility of the Contractor and shall tie into the project datum.

1.2.5.2 DESIGN DETAILS AND STANDARDS

The Contractor shall provide a design and construction package that uses the design details and features given or referenced in this RFP. Additional details shall be created by the Contractor as required, but shall conform to the requirements of this RFP and are subject to approval by Government.

1.2.6 SPECIFICATIONS

The Contractor shall provide a design and construction package that uses the Unified Facilities Guide Specifications (UFGS). A list of known UFGS sections required for this RFP are provided in, Section 01010, Part 11. The Contractor shall edit these guide specifications for his design submittal. If additional specifications are required, the Contractor shall prepare them. The editing shall primarily conform to the specific minimum standard requirements of this RFP, and secondarily conform to the minimum requirements of the UFGS. If UFGS guide specifications are not available, the Contractor shall prepare the specification using other sources. The format of all specifications shall be similar to UFGS.

1.3 SUSTAINABLE DESIGN AND DEVELOPMENT

This project is to be designed with the intent of maximizing the use of sustainable design and development practices. The Design-Build Contractor must maximize use of the sustainable design and development practices. Guidance on sustainable design for the design and construction of all new Army facilities and the rehabilitation and renovation of existing facilities is contained in the Reference 1 stated in the paragraph below. The design build engineer shall score the project for each submission for sustainable design achievement utilizing the Sustainable Project Rating Tool (SPRT), Reference 2. In addition to submitting the SPRT score sheet, the design build engineer shall also submit a detailed description of points received for each category. The design build engineer is encouraged to strive to achieve the highest sustainable design rating possible; however, at a minimum, this project must receive 25 point certification (formerly Bronze).

1.3.1 REFERENCES

Design and construction shall conform to the latest editions of the references listed below, unless otherwise indicated.

ETL 1110-3-491 of 1 May 2001 Sustainable Design for Military Facilities. (<http://www.usace.army.mil/inet/usace-docs/eng-tech-ltrs/>)

Sustainable Project Rating Tool (SPRT) Version 1.4, 1 June 2002. (<http://www.usace.army.mil/publications/eng-tech-ltrs/etl1110-3-491/a-c.pdf>)

1.4 SECURITY DESIGN

The Contractor shall take into account all information provided in this RFP, and adhere to the security design requirements of AR 190-11 for all facilities.

END OF PART 1

PART 2 CIVIL AND LANDSCAPE-SITE DEVELOPMENT

2.1 TECHNICAL CRITERIA AND STANDARDS

2.1.1 Coordination

Site preparation, site development, development of utility infrastructure and establishment of utility tapping points shall be coordinated thru the Contracting Officers Representative (COR) and Picatinny Armament Research Development and Engineering Center (PARDEC) Project work limits are within the State of New Jersey designated wetland areas and design features must reflect the sensitive nature of the resource protected area (limits are defined later in this technical section). Appropriate transition zone set back limits shall be adhered to in the design and construction of major project features/structures. See Drawing C-1 for available and authorized site development (for three primary buildings) limits. Ancillary work efforts (utility line tap points, vehicle parking areas, walkways, delivery truck service drive areas) required to support new major features may be accomplished in the environmentally sensitive areas provided the contractor adheres to proper coordination and prepares and submits required documentation necessary to advance the project for concurrent reviews and approvals by the PARDEC Environmental Affairs Office (EAO), local municipalities, State of New Jersey. Work in the transition zone may commence only and after permits are granted by the appropriate regulatory activities.

2.1.2 Technical Criteria and Design Standards

Design, demolition, construction and installation of site development features and utility infrastructure for the new Explosives Research and Development Loading Facility (ERDLF) shall be in accordance with and conform to the latest editions of the following technical criteria, design standards, bulletins, handbooks, and references listed below. Latest editions of references shall be construed to mean those in applicable and in use at the date of issue of the Request for Proposal (RFP), unless otherwise indicated. Referenced codes and standards herein and those listed below are minimum acceptable criteria.

New Jersey Department of Environmental Protection: Drinking Water Requirements

Residential Site Improvement Standards, New Jersey Administrative Code (N.J.A.C.), Title 5, Chapter 21 (latest edition)

Standards for Soil Erosion and Sediment Control in New Jersey, New Jersey Soil Conservation Committee, 1981, Morris County Soil Conservation.

New Jersey Flood Hazard Control Rules (N.J.A.C. 7:13)- for retention/detention basins).

New Jersey Administrative Code (N.J.A.C.) 7:14A-7 to 10 and 40 CFR 144-146, 40 CFR 264 and 40 CFR 258 (Discharge of Groundwater).

40 CFR 280 Technical Standards and Corrective Actions Requirements for Owners and Operators of Underground Storage Tanks

10 USC 2826 Public Law 97-214, Military Construction and Military Family Housing

42 USC 4321-4361 National Environmental Policy Act (NEPA)

UFC 3-600-01, Fire Protection Engineering for Facilities

American Gas Association (AGA). Standards and specifications available from AGA, 1515 Wilson Boulevard, Arlington, Va. 22209.

American National Standards Institute, Inc (ANSI) 1430 Broadway, New York, NY 10018:

ANSI B 31.8 Gas Transmission and Distribution Piping Systems
ANSI C105 Polyethylene Encasement for Ductile-Iron Pipe Systems

American Water Works Association, Inc, (AWWA). Specifications below available form AWWA, 6666 Quincy Ave., Denver, Colorado 80235:

AWWA C500, Gate Valves for Water and Sewerage Systems
AWWA C502, Dry-Barrel Fire Hydrants

National Association of Corrosion Engineers (NACE). NACE RP-0286, The Electrical isolation of Cathodically Protected Pipelines, is available from NACE, P.O. Box 218340,Houston TX 77218.

National Fire Protection Association, INC. (NFPA). NFPA Codes are available from the National Fire Protection Association, Inc. (NFPA), Battery Park, Quincy, MA 02269.

NFPA 24 Installation of Private Fire Service Mains and Their Appurtenances
NFPA 58 LP-Gas Storage

U.S. Army Corps of Engineers, New York District, Architect Engineer Instructions (CENYD-AEI)

U.S. Army Corps of Engineers, New York District, Manual of Standard Procedures NANP-1110-1-1

Installation Design Guide (IDG), Picatinny Armament Research Development and Engineering Center

U.S. Department of Transportation, Federal Highway Administration (FHWA), Manual of Uniform Traffic Control Devices (2003 Edition)

Military Traffic Management Command (MTMTC), MTMCTEA Pamphlet 55-17,
Better Military Traffic Engineering (latest edition)

Federal Standard 595 – Uniform Federal Accessibility Standard 2.2

Army Technical Manual TM 5-803-5, Installation Design

Army Technical Manual TM 5-803-14, Site Planning and Design

Army Technical Manual TM 5-813-5, Water Supply, Water Distribution

Army Technical Manual TM 5-814-1, Gravity Sewers and Appurtenances

Army Technical Manual TM 5-814-2, Pumping Station and Forced Mains

Army Technical Manual TM 5-818-2, Pavement Design for Frost Condition

Army Technical Manual TM 5-820-4, Drainage Areas for Other Than Airfields

Army Technical Manual TM 5-822-2, General Provisions and Geometric Design for Roads, Streets and Open Storage Areas

Army Technical Manual TM 5-822-4, Soil Stabilization for Pavements

Army Technical Manual TM 5-822-5, Flexible Pavement for Roads, Streets, Walks

Army Technical Manual TM 5-822-6, Rigid Pavement for Roads, Streets,
Walks

Army Technical Manual TM 5-822-7, Standard Practice for Concrete Pavement

Army Technical Manual TM 5-822-8, Bituminous Pavements Standard Practice

Army Technical Manual TM 5-822-10,Standard Practices for Pavement Recycling

Army Technical Manual TM 5-1300, Structures to Resist the Effects of Accidental Explosions

2.1.3 Civil-Site Development and Utility Infrastructure Design Analysis and Narrative

The successful RFP respondent selected for this Design-Build Project shall submit incremental, timely design submissions for review, comment and approvals for the ERDLF including, but not limited to, the following

a. Civil-Site Development Narrative
b. Utilities Narrative
c. Pavement Design Narrative

d. Sediment and Erosion Control Narrative
e. Stormwater Control and Management Narrative
f. Design Analysis (calculations) Water Supply
g. Design Analysis (calculations) Pipe Thrust Restraint System
h. Design Analysis (calculations) Sanitary Sewer System
i. Design Analysis (calculations) Storm Drainage System
j. Design Analysis (calculations) Stormwater Management System
k. Design Analysis (calculations) Pavements
l. Design Analysis (calculations) Contaminated Wastewater Sump
m. Site Development and Utility Infrastructure Drawings and Details
n. Manufacturer's Design and Installation data for piping systems.

Submission(s) (Requirements, Stages and Contents, etc.) shall be periodic and as scheduled in SPECIFICATION 01012 DESIGN AFTER AWARD SECTION of this Request for Proposal (RFP).

2.2 PROJECT SITE (TOPOGRAPHIC) SURVEY

2.2.1 Topographic Survey

A topographic survey of the Explosive Research and Development Loading Facility (ERDLF) site is included in this Solicitation RFP Document. The site offered for this project is in a narrow constricted area located between Bear Swamp and the foot of a small mountain towering over the site. In order to fully utilize this site existing structures and features must be demolished to allow the placement of the new facilities. This survey (prepared in January 2004) includes surface features (buildings, barricades, revetments, loading docks, walkways, steam lines, compressed air lines, monitoring wells, generators, propane tanks, wooden troughs systems for industrial wastes, fences, lighting poles, storm drain structures, pole mounted grounding systems, remnants of previous structures, roads, utility poles, trees, boulders and boulder fields, abandoned remnants of previous utility support systems, etc.), contours, and utilities. The topographic survey does not reflect the imminent demolition (by PARDEC) of Building Numbers 213,215, 216, and 221 that will be removed prior to the award of this RFP. The Contractor should also refer to the Dover, NJ US Geological Survey quadrangle for topography beyond the limits of the topographic survey.

2.2.2 Survey Controls and Temporary Benchmarks

Recently installed (recoverable for construction purposes) monuments, and benchmark are shown on the topographic survey sheet SU-4 attached to this RFP.

In the event the successful RFP Respondent exceeds the topographic limits provided in this solicitation due to his design solution or determines the survey information is insufficient for whatever reason, he shall acquire any additional surveys and topographic features needed for the design presentation at his cost.

2.3 SITE PREPATORY REQUIREMENTS

Prior to any land or structure disturbance activities or ground probing the successful RFP respondent shall arrange for a scanning of the proposed work limits by Picatinny Armament Research Development Engineering Center (PARDEC) to detect possible buried unexploded ordnance or residue buried explosives or components. The depth of scanning shall be as required based on the depth of foundations for new

facilities and trench excavation for new utilities and utility tie in points. Excavations that exceed four feet in depth will require additional follow on scanning for explosives or residue of explosives by PARDEC. See PART 9 paragraph 9.2.C.

Although not anticipated but if encountered within the projects work areas all buried underground storage tanks (UST's), sumps and piping shall be removed upon coordination with PARDEC Environmental Affairs Office and Contracting Officers Representative (COR).

The proposed project work area and utility connections and tap points/tie-ins will fall within what is considered a resource protection area by the State of New Jersey. Permission to construct and work in this area shall be obtained by the Contractor from the State of New Jersey by the PARDEC Environmental Affairs Office. The basis of the request shall be the physical layout and separation distance of new features from the ecologically sensitive areas. The approximate limit of the protected area is from the Bear Swamp shoreline (edge of water) to a point 50 feet landward (just west of 5th Ave). Parking areas for privately owned vehicles (POV's) and the commercial truck service access drive to the new facility loading dock will require the excavation and pavement placement within the resource protected area. New buildings comprising the ERDLF complex will be located such that they are beyond the 50 foot buffer area (away from Bear Swamp). Existing Building No. 216 (which is to be demolished by PARDEC) is located approximately 55 feet away from the shoreline of Bear Swamp. A new explosives storage facility (magazine) consisting of four bays will be interconnected to the new processing/machining building and accessed by an eight foot wide covered walkway. The magazine will not be heated nor cooled and will not require water or sewer connections. Lighting and lightning protection will be required.

Demolition of various buildings on the ERDLF site shall be done by others to prepare it for the new construction. Primary demolition of structures and shall be accomplished by PARDEC in advance of the issuance of the notice to proceed to the successful offeror. This demolition shall include, but not be limited to the total and complete removal (including foundation systems) of existing Buildings Numbers 213, 215, 216, and 221. The site made available to the successful RFP contactor will resemble a site that has various areas that reflect new earth/soil placement that is graded and sloped to drain in areas that recently supported structures. Supplementary demolition to be accomplished by the successful RFP contractor includes but is not limited to removal of concrete pavement with asphalt overlay, existing above ground and buried utility lines (including conflicting and encroaching steam lines), walkways, remnants of former structures and utility support systems, inactive abandoned post indicator valves and fire hydrants, buried valves, lighting poles, surface and subsurface boulders, tree removal, clearing and grubbing, removal of roots, root balls, stumps and other vegetation required to prepare the site for the work. Tree stumps located under new building sites or other new features to be constructed shall be completely removed; stumps not located under buildings or new features shall be removed to 4 inches below new or existing grade. Tree stumps and attendant soil in root balls shall be disposed of in accordance with the PARDEC Soil Management Plan. If soils are determined to be non-hazardous the tree stumps shall be removed off-project site by the contractor. Asphalt and concrete pavement removed as part of the demolition of Phipps Road shall also be removed to construction/demolition materials holding and testing area within the Installation. Phipps Road shall be removed to the extent required to accommodate the new

facilities (buildings and covered walkways) and new site and area-grading plan. Field observations have indicated that both Phipps Road and 5th Ave consist of a 2-inch thick bituminous surface overlying a 9-inch thick concrete base. Existing utility service lines that are not being used to serve the new buildings shall be capped and abandoned in place or removed and capped at an appropriate location. Existing utility lines, which fall within the limits of the new building and other associated new construction shall be completely removed and capped at appropriate locations beyond these limits. Existing remaining power poles and electrical lines that are remaining within the project limits shall be removed totally to electrical distribution supply line located on the east side of 5th Avenue. Permanent markers shall be placed at the locations of abandoned and capped locations of underground utilities. Marker locations shall be indicated on the project "As-Built drawings. The successful RFP respondent shall develop the following UFGS specification sections to cover this work: SECTION 02220A DEMOLITION and SECTION 02231A CLEARING AND GRUBBING. In the event that previously unknown buried UST's are encountered the specification SECTION 02115A UNDERGROUND STORAGE TANK REMOVAL shall be developed by the contractor to accomplish this work facet. Specifications for unique site development and utility infrastructure that are not covered by the UFGS specifications will require the contractor to prepare selected individualized specifications that address the unique project aspects. With regard to endangered species habitans within PARDEC boundaries, tree cutting shall take place only between 15 November and 31 March.

2.4 SITE DEVELOPMENT

The available site shall be master planned (to efficiently and safely accommodate the buildings comprising the ERDLF complex) and developed to efficiently and functionally support the ERDLF facility and its support structures/building and features. The primary elements of this project consist of the processing and machining building, a separate administrative building, an explosives storage (magazine) structure, privately owned vehicle parking areas, truck trailer delivery apron to loading dock of processing and machining building. Due to ongoing critical functions in other existing processing type buildings in the 200 Area it is mandatory that clear separation distances be maintained in the site layout of the new primary facilities. Separation is to provide protection for personnel in buildings for potential incidents in processing buildings. A clear separation distance of 400 feet must be maintained between Building No. 225 and any new building. An additional 25 foot buffer must be provided to allow the contractor sufficient work space around new building. The Administrative Building must be separated from the processing and machining building by a minimum of 66 feet. The Administrative Building shall be interconnected with the (new) processing and machining building and (existing) Building No. 225 by enclosed walkways five foot wide (clear width). The explosives storage building (magazine) shall be located such that it is no closer to the machining and processing building than 130 lineal feet. The magazine shall be interconnected to the machining and processing building by and enclosed walkway that is 8 foot wide.

The site development plan for the project shall consist of site prepatory activities such as grading, drainage, demolition of conflicting utilities and segments of Phipps road to be removed, the layout of buildings, explosive storage facilities (magazines), contaminated wastewater transfer facility, sidewalks and walkways (both covered and open), delivery

truck access drive to loading dock area, POV parking areas, dumpster pads, miscellaneous equipment pads. Design of buildings to be such that there is quick and ready access for fire and emergency responder personnel from the 5th Avenue side of the structure(s). Access for disabled individuals shall be incorporated into the site design and development. The topographic survey drawing that is provided with this submittal delineates the general area in which the new Explosive Research Development and Loading Facility (ERDLF) complex may be located. Detailed attention must be provided when locating-siting the new facilities to assure that they are located such that they do not violate the site safety plan (see Attachment C) prepared by PARDEC for this project. The location for the explosives storage structure (magazine) shall be such that it is not closer than one hundred and thirty feet to any of the machining or processing areas of the new ERDLF. The magazine shall be a four bay structure consisting of 14ft by 14ft (interior dimension) bays to be interconnected to the processing area of the new ERDLF by a covered eight-foot wide concrete walkway. Handicapped individual ramps shall be provided at the entrance to the administrative building of the new ERDLF complex. See Part 3 of this solicitation for the technical requirements for pavements and sidewalks. The pavements required for this project are a commercial truck service drive (parking and maneuver apron to accommodate a road tractor with a 53 foot trailer without encroachment into 5th Ave) from 5th Avenue to the loading dock area of the new facility (see paragraph 2.8) and two POV parking areas generally located in close proximity to the administrative building and at far end of the machining and processing building. The POV parking area nearest the Admin Building shall have eight parking spaces (including one for handicapped individual) and the POV parking area at the remote end of the Machining/Processing Building shall have five parking spaces. There are no requirements to upgrade or improve the existing road net of the 200 Area under this project.

Project features to be designed shall include an outdoor type contaminated wastewater (pinkwater) transfer facility. The transfer facility shall be located such that it is in close proximity to the new contaminated wastewater collection tank to be designed and constructed by this project. The facility shall be designed such that positive control of any spills during transfer from large collection tank to tanker truck can be contained. Successful RFP respondent is urged to observe and examine the existing transfer facility and base his design on similar concept. The accumulated contaminated wastewater is transferred (pumped) into a PARDEC owned/operated transfer (1500 gallon capacity) tanker truck (with air pump supplied by the energetics operations activity) and transported to the installations central contaminated wastewater treatment facility for treatment. Photo of the existing contaminated wastewater transfer facility (sump) is provided in the Attachment K of this RFP for contractor information as to minimum acceptable requirements. Design of concrete sump shall be in accordance with applicable provisions of 40 CFR Part 1, Subpart D, Chapter 112 and New Jersey Discharge Prevention Attainment and Countermeasures, and shall be based upon the 1500-gallon capacity tanker truck currently in service at PARDEC containing a full tank of contaminated wastewater. The volume of the sump shall be such that it will contain 125% of the tank contents plus the rainwater from a design storm with a six inch per hour rainfall intensity. The existing transfer facility consists of a depressed concrete sump (within Phipps roadway just outside of Building No. 223) that is graded to drain to a central point that is fitted with drain piping and a valve. During non-operational times the valve is left in the open position to allow rainwater from the depressed sump to drain overland into natural drainage. During contaminated wastewater transfer operations the sump drain valve is in closed position to contain any potential spills caused by leakage of tank, overfill or breakdown in equipment. For the new contaminated wastewater transfer facility the design of the vehicular access slopes

of descending ramp and ascending ramp from the sump shall be such that the tanker truck can easily enter and exit the sump for contaminated wastewater transfer activities. The descending and ascending ramps shall be fitted with heavy-duty (wheel load bearing) trench drains near the crest of the ramps to capture and divert any rainwater to preclude the rainwater from flowing down into the sump proper. Concrete drive surface shall be such that it enhances wheel traction during inclement conditions Design and construction shall meet all applicable New Jersey Administrative Code requirements for regulated substance transfer facilities.

Construction activities by design-build contractor within the prescribed distance limit may have to cease (on an intermittent basis) for a period of time if there are ongoing energetics related operations in nearby Area 200 process buildings. The contractor may continue to work on the new facility but in an area that is beyond the prescribed limit (area beyond the 400-foot radius as centered on the north wall of Building No. 225) until such time that the sensitive operation is concluded. Work efforts by the design-build contractor must be coordinated thru the COR with operations activity routinely and on a daily basis. Contractor and suppliers will be bound by pass thru zone requirements if operations are also ongoing. Pass thru requirements must be coordinated between construction contractor and installation operations (energetics) activity. There is a high degree of probability that critical activities may be ongoing in Building 225 on a periodic basis during the term of this design build construction contract. The construction of the covered walkway from the ERDLF complex to Building No. 225 and the exterior surface improvements to Building No. 225 and related regrading of the exterior area shall be coordinated to occur during a period of time that is most suitable to the WECAC Activity at PRDEC.

The design of the new facility will require the excavation of a pit and the installation of an open top concrete vault to house/enclose a new open top stainless steel contaminated wastewater (pinkwater) collection tank (approx. capacity of 3000-5000 gal) that serves the gravity trench drain system within the machining and processing bays of the new building. Process wastewater and wash down water from the individual bays drain to the industrial wastewater holding tank for storage and periodic transfer to contaminated wastewater (pinkwater) treatment facility (Building No. 809). See Attachment J for pinkwater characteristics.

The site development features shall also include area lighting and lightning protection systems for both the ERDLF and for the new magazine structure. These requirements are covered in depth in the Electrical Design part of this RFP. Temporary site development features to be constructed by the successful RFP contractor will include (but not be limited to) site sedimentation and erosion control features that will prevent the migration of sediments from the disturbed project work area into the waterways (Bear Swamp) during the term of construction. Prior to the final inspection and acceptance by the Government the Contractor shall remove the temporary features installed by the Contractor for sediment and erosion control.

Due to the narrow constricted nature (very little developable terrain) of the 200 Area it is necessary to locate the new ERDLF complex, magazine, contaminated wastewater transfer facility, loading dock service drive, POV parking areas within the designated resource protected area. The Design Build contractor on the basis of his facility layout and design drawings shall obtain prior approval and necessary permits from various regulatory activities both within PARDEC and from the State of New Jersey. These approvals are routinely requested by all commercial concerns engaged in construction at PARDEC that are located within the resource protection area. See paragraph 2.3.

2.5 SITE EARTHWORK AND ROCK EXCAVATION

Site earthwork shall consist of excavation of every type of material encountered within the limits of work. The topographic survey included in this RFP document has indicated the locations of the geotechnical test pits and borings that were developed to define the subsurface conditions within this projects limits. The following UFGS specification sections shall be developed by the selected RFP respondent to cover this work: SECTION 02300A EARTHWORK. The Contractor shall adhere to all environmental requirements including the soil management plan and UXO Survey Clearance Certification requirements (Part 9, Section 01010). It is anticipated that varying degrees of boulder, cobble, and possibly rock excavation will be required for building and structure foundation as well as for the trench installation of various sewer and utility lines and masts/poles for new lightning protection system, see Part 3. Payment for rock excavation shall be in accordance with line item(s) presented in the bid schedule, all other excavation shall be included in the lump sum Base Bid.

The RFP contractor shall optimize cutting and filling requirements for the new project. Soils excavated if determined not contaminated shall be reused as fill material where required provided they are of a satisfactory nature. Contractor shall develop a soil management plan as required in the Environmental part of this RFP. The contractor shall not remove any soils from the project site without the prior permission and approval of PARDEC.

2.5.1 Buried Foundations

In addition to general excavation, the Design-Build Contractor shall be required to remove previously unknown but encountered buried foundations of previously demolished buildings and remnants of previous utility support systems, barricades and barricade structures where they interfere/conflict with the new work. Picatinny Armament Research Development and Engineering Center (PARDEC) shall be responsible for demolishing Building No.’s 213, 215, 216, and 221 prior to contract award. These areas will be roughly graded and will be sloped to drain. Any subsequent minor demolition required to clear areas for the new facilities by the successful RFP contractor shall have holes and depressions resulting from this excavation filled with satisfactory materials, properly compacted, and graded to drain. If excavations to remove encroaching foundations exceed four feet then the contractor shall stop work and request that additional scanning for unexploded ordnance will be conducted by PRDEC.

2.5.2 Clean Fill and Excess Soil

Borrow material, if needed, shall be obtained from commercial sources outside of PARDEC. Excess soil and excavated rock, boulders, if any, shall be disposed of within the installations boundaries within three miles of the project site as directed by the Contracting Officer (See Part 9). Cobbles and boulders free from excess soil may be re-used for landscaping/architectural purposes where appropriate and if approved by PARDEC.

2.6 CONTRACTOR'S HAUL ROUTE AND STORAGE AREA

The Contractor will be provided with storage and field office area located in close proximity to the project site as shown on the overall site plan. Connection to commercial power, telephone and water and costs for all utilities

required at the storage area and at the contractor's field office shall be born by the contractor. All associated costs for metering devices shall also be born by the contractor. The contractor entrance and haul route for equipment and materials and for his subcontractors is shown on the overall site plan. For delivery of equipment and materials the Contractor and his sub-contractors shall use the Phipps Road Gate. The Phipps Road gate off of the state highway (Route 15—Union Turnpike) shall be used for contractor and his personnel. The normally locked and unmanned rear gate to the 200 area will be made available for use by the contractor on a case by case basis and with formal request by contractor for delivery of unusually large oversized equipment and materials (large loads) that cannot negotiate the existing curves and turns on roadways routinely used for current day access to the project location.

2.7 GRADING

All developed areas shall be graded to provide positive drainage away from all buildings and structures. Finished floor elevations in the three primary buildings comprising this project shall be set a minimum of 6-inches above the proposed finished grade outside of the new complex upon completion of site grading. Depending on the configuration of building design it may be necessary to construct an intercepting swale between the new building and the face of hillside on the rear (West) side of the new building. This swale shall capture and divert draining rainwater that flows from the ridgeline of the mountain around the new building. Standing pools of storm water at any location shall be unacceptable.

Cosmetic outside enhancements to exterior walls of Building No. 225 will require minor grading around the periphery of Building No. 225. Grading shall be such that surface water drains away from the new exterior of Building No. 225.

2.7.1 Soil Erosion and Sediment Control

The Contractor shall design and install temporary soil erosion and sediment control measures prior to any clearing, grubbing, excavation or fill activities. These control measures shall be in accordance with Contractor-prepared Sediment and Erosion Control plans approved by the Morris County Soil Conservation District and shall be maintained until permanent protection or facilities are constructed and placed in service. RFP contractor to incorporate measures that will preclude the deposition of construction site soils on traveled roadways (Phipps Road and 5th Avenue) or that could otherwise ultimately be carried by storm waters into Bear Swamp. Construction entrances shall be provided at all entry points off of 5th Ave and Phipps Road unto the construction site proper. If accidental or incidental soils from construction equipment are deposited on the roadways the soil shall be promptly swept up by contractor personnel.

2.7.2 Hazardous Chemicals

No hazardous chemicals (toxins, corrosives, flammables, oil/grease, fuels, etc.) shall be discharged into the ground surface, storm water drains or sanitary sewer system during construction activities. Material Safety Data Sheets (MSDS) shall be obtained and filed/retained on site for all applicable substances in accordance with Federal and State regulations.

2.7.3 Stormwater Discharge Permit associated with Construction Activities

The area of disturbance due to construction will be greater than 1 acre. The Contractor shall coordinate with, and submit a permit application and plans through the Picatinny Armament Research Development and Engineering Center Environmental Affairs Office to obtain a Stormwater Discharge Permit from the Morris County Soil Conservation District. The Stormwater Management and the Soil Erosion and Sediment Control Plan shall be included in the construction documents. See also Part 9 of Section 01010.

2.8 PARKING, DELIVERY TRUCK ACCESS AND LOADING DOCK AREA

A paved asphalt parking area to accommodate eight (8) vehicle parking spaces shall be provided in close proximity to the new administrative building (of the ERDLF complex). The new parking area shall be interconnected to the entrance of the new administrative building by a sidewalk that is in compliance with the Americans with Disabilities Act (ADA). Parking stalls shall be situated perpendicular to 5th Avenue Each space shall be 10 ft by 20 ft. A 10 ft buffer (safety) area shall be provided between parking stall and 5th Avenue. At a minimum one of the parking spaces shall be a handicapped parking space (13 ft in width). The POV parking area shall be located such that there is a minimum separation of 100 lineal feet from any processing or machining areas of the new facility. This parking area may be located within 30 lineal feet of the administrative areas of the new building but providing it meets the previously cited separation distance from the machining/processing areas. A smaller POV parking area will also be provided at the distant end of the new processing and machining building for 5 vehicles. This remote parking area shall be located not closer (minimum) than 100 lineal feet to the new processing/machining areas of the new building. Parking stall configuration and location in regard to 5th Avenue shall be the same as at the administrative building. Field observations in December 2003 have indicated that the pavement structure of 5th Avenue consists of 8-inches of concrete overlain with approximately 2-inches of bituminous surface material. Phipps Road in the vicinity of the new ERDLF complex appears consist of bituminous pavement. Interface with new paving and existing shall be by neat cuts and sealing of joint between new and existing bituminous pavement. Curbs, curb and gutter combination will not be used unless absolutely required for storm water runoff collection and diversion. In order to facilitate efficient snow removal wheel stops in POV parking areas shall not be used. Parking areas shall be designed and graded such that plowed snow can be deposited at a low area that will preclude melting snow from flowing across parking area or pedestrian walkways.

In addition to the POV parking area the design shall include a commercial truck access from 5th Avenue to the proposed loading dock area for delivery of shipped materials and equipment. The access drive shall be designed to accommodate single axle trucks and tractor-trailer combinations (HS-20 & H-20 wheel loading). The loading dock shall be designed such that it allows free and easy movement of small electric forklifts and motorized pallet jacks. Lift capacity of forklift shall be approximately five tons. Surface area of loading dock shall be ample for easy maneuver of forklifts and pallet jacks. Safety design features of the loading dock and stairs to parking apron shall be in accordance with the Occupational Safety and Health Administration (OSHA) requirements for safety in the workplace. Loading dock area shall have grounding clips and grounding system conveniently available for utilization by transient delivery vehicles. Loading dock shall be outfitted with a portable, commercial, non-sparking material (aluminum) type of

loading ramp/dockboard that can easily be set in place between dock and rear of truck for easy access by forklift or pallet jack. Stairs with non-slip treads and shall be provided to easily access the loading dock deck from the parking apron. RFP respondent shall provide portable aluminum dockboard with integral aluminum curbs. Minimum size acceptable shall be 72 inches (width) by 48 inches (length) and shall be rated by the manufacturer to accommodate a load capacity of 10,000 pounds.

2.8.1 Pavement Marking

Pavement marking for new service drive pavement edge delineation and parking spaces for non-handicapped individuals shall be 4 inches wide and white in color. The designated space for the handicapped individual shall be painted with the standard light blue color. The pavement markings shall contain reflecting fragments for ease of visibility during evening and night periods when vehicle headlights are used. The following UFGS specification section shall be developed by the contractor to cover this work: SECTION 02763A PAVEMENT MARKINGS.

2.9 SIGNAGE

Regulatory signs shall comply with the Manual of Uniform Traffic Control Devices. Street, permanent building identification and all other signs shall comply with the Picatinny Armament Research Development and Engineering Center IDG Section III.2.29. The Contractor shall provide a permanent identification sign for each building and magazine in accordance with IDG Section III.2.29. Traffic control signage shall be provided by the RFP respondent as required for vehicle safety, parking, handicapped individual parking, delivery areas, speed limits requirements, directional indicators, etc.

2.10 STORM DRAINAGE

Existing project area is minimally served by two area drains and conduits that discharge into Bear Swamp. Currently a major portion of the proposed project area (by observation appears to be drained by overland sheet flow that ultimately drains to the impoundment and marshy area identified as Bear Swamp. The new stormwater drainage system shall utilize the best management techniques for retarding stormwater on the site and dissipate runoff into the downstream waterways in predevelopment flow volumes and quantities. This project (ERDLF complex) when constructed shall replace several old buildings comprising a combined total roof area of 28,001 square feet. The successful RFP contractor shall use this value in computing the predevelopment and post development stormwater flow contributions to the downstream watershed. The area immediately west of the project location rapidly rises from and elevation of 720 (approximately) to an elevation in excess of 1100 feet. The terrain can be classified as steep mountainous and heavily wooded for runoff characteristics. There were no erosion rills or areas observed during the site visit in December 2003. See paragraph 2.5 and Parts 3 and 9 for excavation, UXO screening, and soil management requirements.

2.10.1 New Storm Drainage System

New storm drainage control and management facilities for the site shall be designed using the Rational Method for a rainfall of 10-year frequency in accordance with TM 5-820-4. Rainfall intensities for the various times of concentration shall be determined from U.S. Weather Bureau Technical Paper No. 25, Intensity-Duration-Frequency Curves, for New York City. Site evaluation

bonus points will be awarded to RFP respondent designing and providing a storm water dissipation system that minimizes the use of conduits, structures, storm water ponds. The RFP respondent is encouraged to utilize design procedures that maximize the utility of overland (sheet) flow as discharge and dissipation method. The use of turf covered sumps, retardance swales to control peak discharge from the developed site is highly encouraged. The hydraulic capacity of existing storm-drainage facilities shall be checked with the above-mentioned criteria. The structural capacity of new and existing pipes shall be checked for their ability to withstand an H 20 axle load. Pipe strength calculations shall be performed in accordance with the more conservative of the American Society of Civil Engineers (ASCE) Manual No. 77 and/or pipe industry manuals. Pipe shall be either polyvinyl chloride, concrete, or corrugated (ribbed high-density polyethylene (smooth interior), or corrugated steel (smooth interior). The design build contractor shall develop the following UFGS specification section covering this work: SECTION 02630A STORM DRAINAGE SYSTEM.

Surface runoff from the site and the hillside above the site as well as the roof drainage from the new and existing buildings shall be discharged to either a new storm drainage system or a combination of a new system and the existing system. Site development and grading shall be such that there is no concentrated runoff directed to flow thru or over new site features such as walkways, parking areas, existing roadways, truck delivery areas, contaminated wastewater (pinkwater) transfer facilities, or against new buildings or structures, etc. The selected design build respondent shall include provisions in the site development and design to accommodate easy removal of snow from parking areas, walkways and shall include areas for the accumulation of plowed snow to melt gradually and to drain away from the new parking area(s) and from existing roadways.

The Contractor is required to evaluate existing site drainage system and patterns (for extent, function and areas served) before commencing with the design. Storm drains noted during site reconnaissance visit during December 2003 revealed a vigorous flow thru structure during a relatively dry (no rain) period. This could signify the existence of springs in the area or subterranean stream(s). These two inlet structures are shown on the site topographic map and are located just West of 5th Avenue between Building No. 221 and Building No. 225.

2.10.2 Roof Drainage

Storm runoff from the roof(s) of the structures composing the ERDLF processing/machining building, the explosives storage (magazine) building and the administrative building shall be intercepted by gutters and discharged by leaders/downspouts spilling out unto new splash blocks and allowing to flow via sheet overland flow to the natural storm-drainage system or diverted into a subsurface collection system.

2.11 UTILITITES

Utility service connections shall be provided for sanitary sewers, potable water, fire sprinkler water, deluge system water, steam line (to new steam supply line being installed by others and not in this contract), electrical, communications, CCTV, alarm systems, etc. The location of the service laterals for sanitary sewer, service connections for fire water lines, deluge system lines, domestic drinking water lines, electrical

lines, fiber optic lines, CCTV lines and communications lines shall be coordinated between the building's service points and the location of the existing utility infrastructure supply net. Provide plastic marking tape for all underground utilities. This project will require the installation of a fiber optic line (see paragraph 2.15 Electrical and Communications) from the project location within the new ERDLF's communications center to the interior of Building No. 323D on Reilly Road. See other requirements in the Geotechnical, Environmental, Electrical and Mechanical Design Parts of this document. See paragraph 2.5 and Parts 3 and 9 for excavation, UXO screening, and soil management requirements.

All excavations required for installing new utility lines shall be preceded with a request by the contractor to PARDEC to scan excavation route(s) for possible buried or hidden UXO's (see paragraph 2.5).

2.11.1 Existing Utilities

Existing utilities are shown on the topographic survey drawings that are provided with this solicitation to the best detail available. The offeror shall be responsible for verifying the existence, location, size, depth and condition of the utilities. Currently (April 2003) there is a pending project at PARDEC to upgrade the steam distribution lines to which the new ERDLF may tap into for process steam and heating requirements. The new steam distribution line should be in place and available for utilization by this project The Contractor shall notify the Contracting Officer representative (COR) of any unidentified utilities encountered during construction or conflicting utilities. See also paragraph 2.14 steam lines. A current construction project has been underway since late summer of 2003 to install a new ductile iron water distribution main thru the project location. This new main supplants two smaller water lines that provide drinking water (for human consumption and uses and a process water line that provided water for operational and fire protection purposes). The new ductile iron water line and new fire hydrants have been installed thru the project area (just West of 5th Avenue.

In master planning and laying out the new site features comprising the ERDLF complex the selected RFP design build contractor may find it necessary to locate new buildings and other features in areas in which existing active utility lines exist. The design build contractor shall relocate or re-route conflicting existing utility lines to adequately clear all new construction. Existing utility lines will not be allowed to remain beneath the footprint of the proposed new buildings.

2.12 WATER (FOR POTABLE, FIRE SPRINKLER AND DELUGE SYSTEMS)

Currently PARDEC is completing the installation of a new 10 inch ductile iron water distribution main that is located (approximately 10 ft west of the road edge of 5th Avenue. The 10-inch water line is in place but has not been hydrostatically tested for pressure or leakage. The successful RFP respondent may tap into this line in locations that are convenient to his design requirements. The supply service lines (providing water for domestic, fire sprinkler and deluge systems and process water) to the new facility shall be tapped into this recently installed distribution main. The new water service lines shall be cement-mortar lined ductile iron pipe. The design of the pipes shall be in

accordance with the National Fire Protection Association (NFPA) 24 and applicable standards of the American Water Works Association (AWWA) and the American Society for Testing and Materials (ASTM). All bends and tees shall be provided with thrust restraint. Thrust restraint systems for all water lines with diameters greater than 3 inches shall be in accordance with the requirement of the Ductile Iron Pipe Research Association Standard DIPRA –01 (Thrust Restraint Design for Ductile Iron Pipe). Thrust restraint calculations shall be based on a test pressure of 200 pounds per square inch (psi). to be used in testing the new service lines from the supply main to the new building(s). Sprinkler service supply lines and deluge system supply lines shall be provided with cathodic protection. A post indicator valve shall be provided on each sprinkler system supply line. Per request of Installation Fire Chief the PIV's shall be set approximately five feet outward of new building. All new lines shall be pressure tested and disinfected before they are put into service. Hydrostatic and leakage test shall be in accordance with American Water Works Association (AWWA) C600. Disinfection of the new water supply lines and the disposal of disinfection water shall be in accordance with AWWA Standard C 651, Disinfecting Water Mains. The disinfection water must not be disposed of onto the ground. The disposal of the disinfection water must be coordinated with the Picatinny Research Development and Engineering Center Environmental Affairs Office through the COR. The selected RFP respondent shall develop the UFGS Specification section to cover the construction and installation of new water supply lines: SECTION 02510A WATER DISTRIBUTION SYSTEM, SECTION 13112A CATHODIC PROTECTION SYSTEM.

The work shall be in accordance with state and local codes and regulations. The design shall be signed and stamped by a professional engineer licensed to practice in the state of New Jersey. The construction shall be certified to meet state construction standards.

2.12.1 Burial Depth

Water lines shall have a minimum of 4 feet of earth cover. A suitable select stone bedding material shall be provided for the water supply lines. Stone size shall be such that they do not have a detrimental effect on pipe coatings.

2.12.2 Water Meters

A water meter is required for each domestic water service line to the new ERDLF complex. The domestic water supply line provides water for all human consumption activities and for process and makeup water. The unit of volume measure for the meter shall be in gallons. The meters shall be located in the mechanical rooms of buildings requiring water service. Meters shall have the remote readout capability feature.

2.12.3 Existing Water System Pressures and Flows

Current under construction replacement of aged domestic water distribution main and separate process water main by a single new 10-inch Ductile Iron water distribution main (with strategically placed new fire hydrants) has not been sufficiently completed to allow hydrant flow tests to be conducted. Hydrant flow tests have been requested and will be conducted by the RFP contractor. See paragraphs 6.5.2 and 6.5.3 of this RFP for specific Fire Flow Testing requirements and system performance capabilities.

2.13 SANITARY SEWER

The new building connection shall have a slope that provides a minimum cleansing velocity of 2.5 to 3.5 feet per second at the peak flow rate. Sewer piping and associated fittings shall be PVC or ductile iron materials, only. Minimum gravity sewer pipe diameter shall be 8 inches or greater for mains, and shall be 6 inches or greater for laterals. Minimum pipe depth of cover shall be 4 feet. Sewer manholes shall be pre-cast concrete type, that are routinely used by the sewer authorities of the local communities or in conformance with the Residential Site Improvement Standards, New Jersey Administrative Code. Frames and covers shall be cast iron or ductile iron type, only. Manhole covers shall be the watertight type in paved areas. and in areas that are susceptible to periodic ponding of storm water. All manhole frames shall be mechanically fastened to concrete manhole with gasketed connection. All sewers piping within 18 inches of a waterline and/or crossing over waterline shall be concrete-encased. Top of manhole covers shall be installed at 2 inches above grade in unpaved areas, and surrounding grading shall be sloped to direct water away from manhole. Manhole covers shall be installed in paved areas such that top of manhole covers are slightly above grade with surrounding area sloped to direct water away from manhole while maintaining a smooth traffic condition. Pipe strengths shall be determined as indicated in paragraph 2.10.1 above. The new buildings requiring a sanitary sewer service shall be connected to the existing sanitary sewer line running parallel to Phipps Road.

2.13.1 Sanitary Sewer Design

The design shall be in accordance with TM 5-814-1, Sanitary and Industrial Wastewater Collection - Gravity Sewers and Appurtenances. The work shall be in accordance with state and local codes and regulations. The design shall be signed and stamped by a professional engineer licensed to practice in the state of New Jersey. The construction shall be certified to meet state construction standards. Locating new buildings and structures within the provided area may require the relocation or rerouting of the existing sanitary sewer collection system to allow the construction of new facilities.

2.13.2 Treatment Works Permit

The Contractor shall coordinate with and submit a permit application (or modification to existing permit) through the Picatinny Armament Research Development and Engineering Center Environmental Affairs Office to obtain and be issued a Treatment Works Permit from the New Jersey Department of Environmental Protection (NJDEP) with the concurrent approval of the Rockaway Valley Regional Sewage Authority. Obtaining the approval from NJDEP will take approximately 5 to 6 months. It should be noted that this project would not result in the increase of (flow quantities) domestic type wastes than is currently being contributed to the sanitary wastewater collection and treatment systems downstream of Installation. Sanitary flow contributions from this facility are considered to be negligible. The design build contractor (respondent) selected for this project shall fully develop the following UFGS specification section to cover the sewer work: SPECIFICATION 02531A SANITARY SEWERS.

2.14 STEAM LINES

The project location for the new ERDLF complex is such that it will encroach upon existing steam lines providing steam to various existing buildings in the 200 Area. Steam line relocation(s) or

removals predicated by the selected Design Build contractor shall be removed or relocated by PARDEC. The steam and heating requirements for this project are discussed in detail in the Mechanical Design Part of this RFP.

2.15 ELECTRIC AND COMMUNICATIONS

Electrical and communications project features are discussed in greater detail in the Electrical and Communications Parts of this RFP. This project will require the underground burial installation of a new fiber optic line from inside of Building 232D to the communications center of the new ERDLF. The route of the proposed fiber optic line shall be along the existing road net of the 200 Area. A topographic strip survey is provided for the RFP respondent to use in the design and route selection for this new fiber optic line. See paragraph 2.11 UTILITIES and Part 3 of Section 01010

2.16 LANDSCAPE DESIGN

2.16.1 LANDSCAPE PLAN

The RPF respondent shall provide a minimal Landscape Plan in accordance with the Picatinny Arsenal Installation Design Guide. The landscape plan shall be approved by the installation's natural resource manager. Due to the industrial nature of the facility a formal landscape plan will not be require. There are limitations and requirements on removal of trees. Any tree cutting must be done from November 15th through March 31st. Existing trees determined to remain shall be incorporated into the Landscape Plan.

2.16.2 Turf Grasses

All natural disturbed areas due to demolition, grading and construction of new facilities shall be minimally covered with a healthy growth of Turf grasses. Turf areas shall be all areas not covered by buildings or pavement. The following UFGS specification section shall be developed to cover this work: SECTION 02921A SEEDING. A minimum of 2 inches of topsoil shall be provided. The topsoil shall be procured from commercial sources and shall be augmented as necessary to support turf growth. The topsoil shall be fertilized, seeded and irrigated and maintained by the contractor until such time that a lush vegetative growth is established and the turf has been mowed two times. The RFP contractor is encouraged to use as a part of his design turf line swales, sumps and channels to handle storm water runoff and dissipation.

2.17 FUEL LINES

The ERDLF complex will not require installation of fuel lines.

2.18 EXISTING MONITORING WELLS

The successful RFP respondent shall take all precautions necessary to protect existing monitoring wells located at random areas within the general project area and in the area designated as the contractors laydown, storage and field office area. The contractors

design of the new ERDLF complex should be based in a manner that will avoid the interfering with the operations of the monitoring wells. The contractor’s utilization of the area provided for field office, laydown and material/equipment storage shall also be in such a manner that the operation of the monitoring well will not be impacted. In the event that the contractors design solution is such that the monitoring wells are impacted and removal is required the contractor will be responsible for performing the work properly (removal per NJAC requirements) and coordinated with the Environmental Affairs Office at the contractor’s expense.

2.19 AS BUILT DRAWINGS

The Design/Build Contractor shall maintain during the term of construction accurate (scale and dimension) drawings of all site development and utility work completed to date. Upon completion of the project the contractor shall furnish the COR with two hard copies of completed and corrected “AS BUILT” drawings In addition to the hard copies the contractor shall also provide the COR with two compact discs reflecting the electronic version of the as built drawings that can be readily opened and reproduces in a CADD format.

2.20 DRAWINGS ACCOMPANYING RFP

The drawings prepared for this RFP are in MicroStation V8.1 format and should be plotted in “E” size for maximum clarity and legibility. The drawings provided as a component of Part 2 of this RFP are as listed:

T-1	TITLE SHEET
T-2	INDEX OF DRAWINGS
T-3	GENERAL PLAN
C-1	SITE PLAN
C-2	SITE PLAN
C-3	SITE PLAN
SU-1	TOPGRRAPHIC SURVEY
SU-2	TOPOGRAPHIC SURVEY
SU-3	TOPOGRAPHIC SURVEY
SU-4	TOPOGRAPHIC SURVEY
RC-1	REFERENCE DRAWING (WATER AND SEWER PLAN)
RC-2	REFERENCE DRAWING (STEAM LINES)
RC-3	REFERENCE DRAWING (WETLANDS DELINEATION PLAN)

The reference drawings were obtained from the PARDEC archives and are being furnished to the RFP respondents for strictly reference purposes with the exception of RC-3 which was provided to the designers during the design charette to clearly indicate the sensitive wetland areas located in close proximity to the project.

END OF PART 2

PART 3 GEOTECHNICAL DESIGN

3.1 GENERAL

The successful offeror for the design-build contract shall design and construct a new Explosives Research Development and Loading Facility (ERDLF) including new pavements for loading dock access and parking, new utilities, and other associated features and appurtenances. The new pavements shall be bituminous concrete (asphalt) and the pavement section (structural) shall be designed to compensate for seasonal frost penetration into the subgrade. New pavements and concrete sidewalks and contaminated wastewater transfer station shall also be as specified in PART 2 and paragraph 3.7 of this PART. The Contractor shall become familiar with the approved Site Safety and Health Plan (SSHP) prior to any excavation work. Also, see SECTION 01420 SAFETY and PART 9 of this SECTION.

3.2 GEOTECHNICAL DESIGN, ANALYSIS, AND NARRATIVE

The requirements for the foundation design shall include but not be limited to type of foundations, size of foundations, subsurface and geology report, soil/rock strength parameters, subsurface exploration logs, bearing capacity analysis, and settlement analysis. The Contractor shall also prepare a pavement design for all new concrete and asphalt pavements and any required road/pavement reconstruction; see paragraph 3.7 for additional description of pavement requirements. Other design requirements include preparation of specifications, foundation drawings and notes as required for this project. The Contractor shall obtain the services of a geotechnical engineering consultant licensed as a Professional Engineer in the State of New Jersey, who shall prepare for Contractor submittal all geotechnical analysis and design including a recommended foundations narrative, data and foundation and pavement calculations in an individual Geotechnical Design Analysis (GDA) document for review and approval by the Contracting Officer. The narrative shall discuss the type of foundations for the building and structures as determined from the Contractor-selected subsurface exploration and testing results. The Contractor shall present all preliminary and Contractor-performed subsurface exploration logs and their locations as part of the Civil drawings and specifications.

3.3 ARMY AND COMMERCIAL STANDARDS AND DESIGN MANUALS

Design and installation shall conform to the latest editions of the references listed below, unless otherwise indicated. Additional criteria not specifically identified below shall also apply, if directly referenced in any of the listed documents.

Architectural and Engineering Instructions Manual, New York District, US Army Corps of Engineers (NYD-AEIM), latest edition.

NANP-1110-1-1, Manual of Standard Procedures for Planning Design.

AMC-R 385-100, Army Material Command Safety Manual.

DA PAM 385–64, Ammunition and Explosives Safety Standards, 15 Dec 1999.

EM 1110-1-1902, Settlement Analysis.

EM 1110-1-1905, Bearing Capacity of Soils.

EM 1110-1-1906, (1996) Soil Sampling.

EM 1110-2-1906, Engineering and Design, Laboratory Soils Testing.

ER 1110-345-700, Design Analysis, Drawings and Specifications.

TM 5-818-1, Soils and Geology Procedures for Foundation Design of Buildings and Other Structures (Except Hydraulic Structures).

TM 5-822-2, General Provisions and Geometric Design for Roads, Streets, Walks, and Open Storage Areas.

TM 5-822-5, Pavement Design for Roads, Streets, Walks and Open Storage Areas (Incl. 1).

TM 5-822-10, Standard Practice for Pavement Recycling.

UFC 3-490-04A

New Jersey State Department of Transportation (NJDOT), Standard Specifications for Road and Bridge Construction.

ASTM D 1452 (1980; R 1985), Soil Investigation and Sampling by Auger Borings (as applicable).

ASTM D 1586 (1984; R 1992), Penetration Test and Split-Barrel Sampling for Soils (as applicable).

ASTM D 2487 (1993), Classification of Soils for Engineering Purposes (Unified Soil Classification System).

3.4 SPECIFICATIONS

Required geotechnical specifications are listed in PART 11 of this SECTION. These specifications are based on the Unified Facilities Guide Specifications (UFGS) for Construction and are unedited. Additional geotechnical related specifications may be required as determined by the Contractor, or as recommended by the Contracting Officer. If additional specifications are required, the Contractor shall select and edit the appropriate specification from available UFGS sections. The Contractor may elect to use the applicable NJDOT Specifications for design and construction of pavements and sidewalks. The designer shall edit all specifications in accordance with the “NOTES” inserted within each UFGS Section and per the guidance of ER 111-345-700, Design Analysis, Drawings and Specifications. Regardless of the specification format/source or content of the “NOTES”, satisfactory material for fill and backfill shall contain particles having a maximum dimension of 6 inches in any direction except materials located within 12 inches of permanent concrete, utilities, or pavement base shall have a maximum dimension of 3 inches in any direction. See PART 2 and other paragraphs of this PART for additional earthwork requirements and restrictions.

3.5 SUBSURFACE CONDITIONS

Preliminary subsurface investigations consisting of test pits ranging to 10 feet deep, soil borings ranging to 50 feet deep, and limited soils testing, were

performed in January 2004 and May 2004 by URS Corporation and their subcontractor Jersey Boring and Drilling Contractor; locations are shown on the drawings. The explorations were excavated and drilled to determine the depth to bedrock and the characteristics of the overburden materials and groundwater in the general vicinity of the proposed building, and along 10th Street and 5th Avenue along the route of the proposed mass communication fiber optic line from Building 323D to the approximate general ERDLF building location. The preliminary investigation results and Geotechnical Report by URS are included as Attachment L and are provided for the Offerors' consideration and use in preparing their bids, who shall be solely responsible for determining their usefulness and completeness. Additional investigations shall be performed if deemed necessary by the Contractor and shall be solely at their selection and expense; see paragraph 3.8 for additional requirements. Offeror's are advised that recommendations contained within the URS report are not binding, and are superceded by any differing requirements stated within this SECTION. Based upon the preliminary investigation results, it is expected that the boulders and ledger rock can be excavated by large hydraulic excavation equipment, i.e. without systematic hammering and/or blasting. Blasting shall not be permitted. The quantity of excavated material usable as satisfactory material for general fill and backfill shall be assumed to be no more than 30 percent by volume of the total material excavated. Groundwater typically in the form of springs and perched water was generally encountered at elevations ranging from 708 feet to 712 feet in the vicinity of the proposed structures, and at a depth of 3 to 4 feet along the proposed fiber optic utility routing. Dewatering of required structure and utility excavations shall therefore be expected and associated costs shall be included in the Offeror's bid proposal. See PART 9 of this SECTION for construction water handling and discharge requirements.

3.5.1 Bedrock

The preliminary test pits and borings indicate numerous boulders, ledger rock, and cobbles, and rock is exposed in outcrops immediately to the east in the project vicinity, but intact bedrock that would require hammering and/or blasting for removal was not encountered.

3.5.2 Overburden

The overburden as interpreted from the preliminary explorations generally consists of:

a. A mixture of Sand, Gravel, and Silt with numerous cobble and boulder-sized bedrock fragments that were reworked during the original cut and fill.
b. Naturally occurring and blast-produced ledger rock, rounded cobbles and boulders that range up to 36 inches and 25 cubic feet in size, Silty Sand and Gravel (SM-GM), and occasional bricks, concrete and other assumed construction debris.
c. Shallow spring (perched) water was observed entering several trench pits, with an estimated elevation ranging from 708 feet to 712 feet.

3.6 RECOMMENDED FOUNDATION

The preliminary investigation results indicate the proposed structures may be founded on shallow footings. A maximum allowable soil bearing capacity of 4000 psf shall be assumed for bidding purposes. The minimum depth of the foundation bottom shall be 36 inches below exterior finished grade, or deeper if recommended in the Contractor's GDA, to account for the frost penetration. To eliminate differential footing settlement and bearing, the Contractor shall excavate all materials including over-digging and removal of boulders, cobbles, and other over-sized

materials as necessary to provide a minimum 12-inch thick layer of NJDOT aggregate base material beneath the footings. All interior concrete slabs on grade shall be underlain by a minimum 10-mil thick polyethylene vapor barrier, placed over a minimum 6-inch thick capillary water barrier consisting of ASTM C33 Size No. 57 aggregate or approved equivalent. Interior equipment pads shall be placed over a minimum 4-inch thick layer of capillary water barrier or NJDOT aggregate base material. Fill material beneath structures shall consist of sand or sand with gravel and/or silt per ASTM D 2487. All materials placed beneath the structures shall be placed in maximum 6″ thick lifts and compacted to at least 95 percent of the laboratory maximum density as determined by ASTM D 1557. All subsurface walls for occupied spaces including sumps/pits shall be protected against water intrusion in the form of shallow groundwater or perched (spring) water flow. Minimum protection shall include damp-proofing of all exterior surfaces and positive foundation drainage along with waterstopped construction joints for sump/pit and 'perimeter' walls. The Contractor shall design the foundations for all building and magazine features from the additional Contractor-performed investigation results and from whatever preliminary investigation results they deem acceptable. All geotechnical design and analysis shall be presented in the Contractor's GDA.

3.7 NEW LOADING DOCK SERVICE DRIVE AND POV PARKING PAVEMENTS

The Contractor shall design and construct new bituminous concrete (asphalt) pavements for a service drive and parking as described in paragraph 2.8 of this SECTION, and whatever additional pavements are required for the final project design. The service drive will provide delivery truck access from 5th Avenue to the new facility's concrete loading dock and contaminated wastewater transfer stations, the requirements of which are described in PART 2 of this SECTION. The existing 5th Avenue and Phipps Road pavements consist of 8-inches of concrete overlain with 2-inches of flexible (asphalt) pavement and is in average condition. Pavements for parking of privately owned passenger vehicles shall be provided at two locations as described in paragraph 2.8. The new service drive and parking pavements shall be designed for a Class E type road in accordance TM 5-822-2 GENERAL PROVISIONS AND GEOMETRIC DESIGN FOR ROADS, STREETS, WALKS, AND OPEN STORAGE AREAS. Design of asphalt pavements shall also be in accordance with TM 5-822-5, Pavement Design for Roads, Streets, Walks and Open Storage Areas (Incl. 1), with frost conditions governing section materials and thickness. The successful RFP respondent may elect to use NJDOT Design Manuals and Specifications to design and construct the new service drive, parking lot, sidewalks, and other necessary pavements. Any additional investigations deemed necessary by the Contractor to design and construct the required pavements shall be performed in accordance with paragraph 3.8.

3.7.1 Concrete Sidewalks and Exterior Equipment Pads

The sidewalks shall consist of a minimum four-inch thick concrete sidewalk (wire mesh reinforced) underlain with a minimum four-inch thick base course over a minimum 4-inch thick capillary water barrier over a compacted subgrade. The Contractor shall place minimum 12-inch concrete pads (wire mesh reinforced) underlain with a minimum four-inch thick base course over a compacted subgrade for mechanical equipment located outside of building structures. If soil investigation parameters and/or final GDA results determine that seasonal frost heave of subgrade or backfill soils will be a problem then additional capillary stone barrier shall be provided beneath the sidewalks and/or equipment pads as determined appropriate by the final GDA.

3.8 ADDITIONAL SUBSURFACE INVESTIGATIONS AND TESTING

Preliminary subsurface investigation results are included as Attachment L to this RFP package. The Contractor shall review these preliminary results and shall perform whatever additional investigations they deem necessary to determine the full extent of project-specific subsurface conditions in order to properly design and construct all aspects of the required project. The locations and types of additional subsurface explorations and/or testing shall be solely at the Contractor’s selection and expense. Explorations shall be in accordance with EM 1110-1-1906 "Soil Sampling” and applicable ASTM Methods. All laboratory testing of samples shall be at a Corps of Engineers approved laboratory testing facility, and shall be performed in accordance with EM 1110-2-1906 "Laboratory Soils Testing" and applicable ASTM Methods. A list of Corps of Engineers approved laboratory testing facilities will be made available upon request. The Contractor shall submit a Plan describing the additional investigation explorations and/or testing including planned locations to the COR for review and approval. Digging permits are necessary for all subsurface work to be performed at ARDEC. The Contractor shall be responsible for obtaining all applicable clearances and permits and for the protection of all underground utilities from damage during field investigations. Submittal of the approved investigation Plan to the DPW shall be coordinated through the COR, and the Government shall be held harmless for any delays or difficulties encountered in obtaining permits or approval or to perform the actual work and complete the subsequent design and construction activities. All data from the subsurface explorations and laboratory testing utilized for the design and analysis shall be reported in the Contractor-prepared GDA and shall be included in the Final specs and drawings.

END OF PART 3

PART 4 ARCHITECTURAL DESIGN

4.1 PROJECT DESCRIPTION

The contractor shall design and build a new Explosion Research & Development Loading Facility (ERDLF) at Picatinny, New Jersey, as shown in the attached drawings and as described in this section. The facility includes four major components: Administration, Explosive Processing, Explosive Machining, and Explosive Storage. As a research and development facility, design of the components and their relationships, adjacencies and relative space requirements will be atypical and may require the help of explosive facility design specialists.

Support facilities shall include storm and sanitary sewers, potable water, electric district heating, fire protection and alarm systems, paving, lighting, information systems, utilities and site improvements as described in the Civil and Mechanical Parts of this RFP.

4.1.1 Location

The ERDLF will be located at the west of Phipps Road at the bottom of the ridge line at Picatinny Arsenal (see drawings). Building footprints and layouts are provided for reference only and are not meant to exclude contractor-generated designs or layouts. Compliance with Section 01010 is required for functional relationships and safety mandates. This facility is located in Zone V (The Tracts). Reference drawings provided in this RFP.

4.1.2 Area

The maximum allowed area of this facility is 28,000 gross square feet and shall comply with the room-by-room space requirements provided herein. The minimum allowed area is 21,000 gross square feet. NOTE: Covered walkways that are not enclosed are to be calculated at half the area covered. Enclosed walkways must be considered full scope, i.e. no reduction is allowed.

4.2 APPLICABLE STANDARDS

The design requirements within Section 01010 represent the minimum quality and quantity acceptable for the proposals and projects submittals. Each Contractor shall be responsible for obtaining any documents referenced in this section but not attached. In the event of criteria conflict, the requirements of this section shall be deemed the controlling authority. The design shall comply with the following applicable standards. Equipment, hardware, and materials shall be standard manufactured items unless otherwise specified. Replacement parts shall be standard and readily available through commercial means. Discontinued products will not be accepted unless approved by the Contracting Officer. All standards cited below are the latest edition, unless otherwise specified.

Uniform Facilities Guide Specifications (http://www.hnd.usace.army.mil/techinfo/gspec.htm)

National Fire Protection Association (NFPA) 101, Life Safety Code

International Building Code (IBC)

ANSI/CABO A117.1 ADA Accessibility Guidelines for Buildings and Facilities

UFC 3-600-01, Fire Protection Engineering for Facilities, 17 April 2003 with change dated 20 August 2003 (http://65.204.17.188//report/doc_ufc.html)

USACE Technical Instruction TI 800-01 Design Criteria http://www.hnd.usace.army.mil/techinfo/ti.htm

Picatinny Arsenal Installation Design Guide (Attachment B)

US Army Design Standards, http://www.mantech-mec.com:8500/army_ids/index.cfm

ETL 1110-3-491, dated 1 May 2001 Sustainable Design for Military Facilities (http://www.usace.army.mil/inet/usace-docs/eng-tech-ltrs/)

Sustainable Project Rating Tool (SPiRiT) Version 1.4, 1 June 2002 (http://www.usace.army.mil/publications/eng-tech-ltrs/etl1110-3-491/a-c.pdf)

New York District Corps of Engineers (NYCOE) Manual of Standard Design Procedures

DA Pamphlet 385-64, Explosive Safety Standard (http://www.biggerhammer.net/manuals/ammo_explosive_safety_p385_64.pdf)

AR 190-11, Physical Security of Arms, Ammunition and Explosives (http://www.army.mil/usapa/epubs/190_Series_Collection_1.html)

AMC-R 385-100, Explosives Safety Manual (http://www.amc.army.mil/amc/ci/regs.html)

Tri-service Blast Design Manual, Army TM 5-1300 (http://www.usace.army.mil/inet/usace-docs/armytm/)

4.2.1 English Unit Design

This project shall be designed in the English Unit (I-P) System. Metric design may be used as a secondary, dual dimensioning system.

4.2.2 Drawings

The floor plans for this facility are provided for reference only. It is intended that they indicate only a possible layout that

may be acceptable for functional adjacency requirements and space allocations. The Contractor must provide a layout that is efficient and effective for the overall facility operation. The Government will consider variations of the layout provided. The Contractor shall verify all information provided on the drawings included in this RFP. The drawings provide only functional requirements of the facilities and a suggested solution to the required layout. The Contractor shall develop a design based on these requirements, in addition to the referenced codes and regulations. All drawings are available in electronic file format (MicroStation) http://www.bentley.com/en-US/Products/MicroStation/. The Contractor shall provide a design and construction package that uses the design details and features given or referenced in this RFP. Additional details shall be created by the Contractor as required, but shall conform to the requirements of this RFP and are subject to approval of the Contracting Officer.

4.2.3 Specifications

The Contractor shall use the Unified Facilities Guide Specifications (UFGS) for this project. The Contractor shall edit these specifications for all design submittals. If UFGS are not available, or if additional specifications are required, the Contractor shall prepare the technical specification using other sources. The format of these additional specifications shall match those of the UFGS, and shall include the same major headings and elements of this system. The editing shall primarily conform to the specific minimum standard requirements of this RFP, and secondarily conform to the minimum requirements of the UFGS. The format of all specifications shall be similar to UFGS. The UFGS specifications listed in Section 11 shall be used, as applicable.

4.2.4 Design submittals

The contractor shall make the architectural submittals in accordance with Section 01012, DESIGN AFTER AWARD. In addition, the following specific submittals shall be made as indicated.

4.2.4.1 Life Safety Requirements

The contractor shall submit a complete Life Safety Plan indicating, as a minimum, the locations of all necessary fire doors, fire walls, egress routes, emergency stairs (if required), fire alarm pull station locations, egress travel distances, and required standoff distances. All elements must comply with NFPA 101.

4.2.4.2 Material submittals

The contractor shall submit, per the contract schedule, the following material submittal:

4.2.4.3 Hardware Submittal

The contractor shall submit a hardware schedule compliant with UFGS 08710, DOOR HARDWARE. As a minimum the following information shall be provided:

Hardware Item and Description:

Location:
Manufacturer name and catalog number:
Features:
Finish:

4.3 DETAILED SCOPE OF WORK

The contractor shall be responsible for the completion of the following specific tasks for the ERDLF identified within this RFP.

4.3.1 Building Design (all components)

The facility shall include four major components as described above; namely, Administration, Explosive Processing, Explosive Machining, and Explosive Storage. Specific requirements for each component are outlined below. Except as otherwise specified, the requirements of this RFP shall apply to all components.

4.3.2 Design Guide

Except as otherwise specified herein, all buildings and explosive storage facilities shall be designed and constructed in accordance with the Picatinny Arsenal Installation Design Guide. This facility is located in Visual Zone V (The Tracts) and is considered an industrial campus building.

4.3.3 External Activities

Vehicular access shall be provided as required by the civil design requirements of this RFP. Personnel will access the facility by government vehicles, privately owned vehicles (POVs), bicycles and by walking from other nearby facilities. Additional paved sidewalks connecting to other pedestrian walkways shall be provided for all exit doors and the mechanical equipment rooms.

4.3.4 Internal Activities

The facility houses Army staff and contractor personnel. Visitor control is through the administration central lobby and reception counter. Staff may access the facility through the lobby or by means of card access at secondary entrances. The individual space requirements are contained in the room-by-room requirements contained in this RFP.

4.3.5 Space Adjacencies

Floor plan adjacencies shall be developed based on the room-by-room requirements and the floor plan included in the drawings. After award, minor revisions or refinements to the Contractor’s floor plans may be required to better meet the mission requirements.

4.3.6 Space Allocations

Individual space allocations shall be developed based on the room-by-room descriptions and the floor plan diagram contained in the appendices of this RFP. After award, minor revisions to the

Contractor's floor plans may be required to better meet the mission requirements.

4.3.7 Barrier Free Design

This facility shall be fully accessible to all handicapped individuals in accordance with the requirements of the Americans with Disabilities Act (ADA) and the Uniform Federal Accessibility Standards (UFAS).

4.3.8 Life Safety Plan

All structures shall have exits and means of egress that comply with the requirements of NFPA 101, to assure protection of occupants from fire or similar emergencies, except as modified by UFC 3-600-01. The facility shall be approved by the Department of Defense Explosives Safety Board (DDESB) prior to occupation, which requires a separate submittal at the 60% completion stage. This process typically takes 60-180 days and must be closely coordinated with the DPW at Picatinny Arsenal. Reference Room-By-Room Requirements for explosive allowance design requirements for the Explosive Processing and Explosive Machining components.

4.3.9 Fire Safety

Minimum allowable construction type, per UFC 3-600-01, Fire Protection Engineering for Facilities, shall be Type I non-combustible construction, but actual construction type shall be determined and proposed by the contractors after code analysis. Actual building type and fire ratings shall be verified with the Picatinny Fire Marshall or other Authority Having Jurisdiction (AHJ). The interior of the facility shall be fully sprinkled. Fire Department access shall be provided on all sides of the building. The Explosive Processing, Explosive Machining, and Explosive Storage components shall be classified per International Building code (IBC), latest edition. The occupancy shall be as required by NFPA 101 and UFC 3-600-01, using Type I construction. The Administration component consists of offices, conference space and toilet facilities, and shall be a single-story, Type IA or IB construction. The contractor shall be responsible for compliance with NFPA 101 and UFC 3-600-01 for all components of this facility, including exterior walkways.

4.3.10 Interior finishes

All interior finishes shall conform to the requirements of NFPA 101, except as modified by UFC 3-600-01. Interior finishes for all exits and rooms shall be Class A only. Interior finish for all other areas shall be either Class A or Class B. The use of Class C materials is not permitted. Smoke developed ratings by ASTM E-84 shall not exceed 50 for Class A materials and 100 for Class B materials. Cellular plastics shall not be used as interior finish material.

4.3.11 Security Design

Security requirements for this facility shall comply with AR 190-11, PHYSICAL SECURITY OF ARMS, AMMUNITION AND EXPLOSIVES. The Contractor shall take into account all information provided in this

RFP, and adhere to the security design requirements of the above references for all components of the facility. Additionally, all areas and rooms indicated to have explosive allowances in the Explosive Processing and Explosive Machining components will process, test and/or store Category 1.1D explosive materials. As per the projected Explosive Research & Development Loading Facility Standard Operating Procedures (see Appendices), rooms that process and test explosive materials may be left unattended temporarily during the day, with facilities and rooms locked and secured, for the purpose of operator breaks and simultaneous operations occurring in other components/rooms.

4.3.12 Anti-Terrorism/Force Protection (ATFP) Requirements

The building is assumed to have only 10 occupants at any given time, and therefore, is not subject to the DoD Antiterrorism/Force Protection Minimum Standards.

4.3.13 Sustainable Design and Development

Refer to paragraph 1.3.

4.3.13.1 Energy Conscious Design

Active solar systems are not permitted. Passive solar design shall be limited to building orientation, thermal mass, roof color, building color, door and window orientation, window glazing, window shading, and shade tree types and locations in accordance with the New York District Corps of Engineers (NYCOE) Manual of Standard Design Procedures.

4.3.14 Acoustical Design

The Administration component Conference Room perimeter walls shall be designed and constructed using tested assemblies with a minimum sound rating of STC 45. Copy and equipment rooms, mechanical and electrical rooms and toilet/janitor rooms shall be designed to provide a sound rating of STC 40. Door and frame assemblies shall be accounted in sound ratings of total wall assemblies.

4.3.15 Building Systems, Materials, and Equipment

The proposed building systems, materials, and equipment shall be in accordance with the Picatinny Arsenal Installation Design Guide and the requirements of this RFP. The intent of this RFP is to allow Contractors the maximum flexibility to design and construct this facility in an economical manner without sacrificing good engineering practices, quality materials and systems. The Government desires low- or no-maintenance finish materials to the greatest extent possible. The exterior building color, including the roof color shall be as outlined in the referenced design guide. Note: Building materials as described herein for walls, ceiling and floors, are minimum requirements, and may require revision based on code compliance and criteria.

4.3.15.1 Concrete

Concrete may be used for architectural elements such as splash blocks, window sills, window surrounds and parapet coping. All exterior finished architectural concrete shall be sealed against water penetration using two coats of clear, non-sheen, impregnating sealer. Precast concrete may be used for walls if demonstrated to meet explosive requirements.

4.3.15.2 Walls

Wall materials shall be determined by evaluation of blast characteristics of the space(s) involved. Where blast potential does not exist, the contractor shall have the choice of providing walls per the guidance that follows.

4.3.15.2.1 Exterior and Interior Masonry Wall Construction

Exterior concrete masonry used shall be single- or double-wythe construction. Concrete masonry units and mortar shall be manufactured using integral water repellant as an efflorescence barrier. All exterior finished masonry shall also be sealed against water using an impregnating sealer. All interior concrete masonry except in mechanical rooms shall be of manufacturer’s standard, integrally colored concrete masonry units. Interior masonry corridor and room walls that are not furred out are to be sealed similar to exterior walls. Exposed masonry walls in mechanical areas are to be sealed. Mechanical room walls shall be constructed with full-height reinforced masonry units constructed to the underside of the structural deck, with all cells filled solid with grout.

4.3.15.2.2 Concrete Wall Construction

Reinforced concrete walls are required in blast areas. Contractors may also provide poured-in-place concrete walls in lieu of CMU. Concrete shall be as specified in the Structural Part of this RFP, and shall include all steel reinforcing as necessary. All exposed concrete walls shall have two coats of a durable concrete sealer applied, thickness as recommended by the manufacturer.

4.3.15.2.3 Exterior Wall Finish

The exterior walls for all components shall be an Exterior Insulation and Finish System (EIFS), and shall comply with UFGS Specification 07240, EXTERIOR INSULATION AND FINISH SYSTEM. Exterior walls of the enclosed walkways shall also use EIFS. System shall be PM Class high-impact resistant, medium finish, color as allowed in the Picatinny Arsenal Installation Design Guide. EIFS shall be a job-fabricated exterior wall covering consisting of sheathing, insulation board, reinforcing fabric, base coat, finish coat, adhesive and mechanical fasteners as applicable. The system components shall be compatible with each other and with the substrate as recommended or approved by, and the products of, a single manufacturer regularly engaged in furnishing Exterior Insulation and Finish Systems. Insulation board shall be standard product of manufacturer and shall be compatible with other systems components. Substrate shall also be prepared as required in UFGS 07240, shall be directly applied over CMU, must be sound, true, plumb, and be within flatness tolerances specified by the EIFS manufacturer. Color shall be light, as approved by the

Contracting Officer. Heavy-duty concrete filled steel bollards shall be provided at all vehicle (truck, forklift, etc.) exterior entrances to the building on both sides of openings. Bumper rails shall also be provided at high traffic areas inside the facility to avoid potential damage at areas where EIFS system is exposed.

4.3.15.2.4 Exterior and Interior Fire Walls

All walls determined by the contractor to be required as fire walls shall meet the requirements of UFC 3-600-01. All fire walls using gypsum board shall use Type X board as required by code.

4.3.15.2.5 Wall base

Wall base shall be appropriate for the finished wall and floor systems used. Allowable materials shall be ceramic tile, rubber, vinyl, or stained and painted wood base. The base shall be a minimum of 4 inches high. Ceramic tile shall be used for toilet rooms and janitor’s closets, and shall be integral with the floor and wall tile.

4.3.15.2.6 Interior Wall Finishes

4.3.15.2.6.1 Paint

Painted gypsum board walls, exposed to view, shall have a minimum of two coats of latex paint over primer. Finish shall be eggshell in office/conference areas and semi-gloss in wet or damp areas and storage areas. All non-textured walls shall be painted, except for walls to receive ceramic tile or other material. Gypsum board in all wet areas shall be moisture resistant unless tiled with backerboard. Corridors in the processing areas that use gypsum board for walls shall be high-impact type.

4.3.15.2.6.2 Vinyl Wall Covering

As a minimum, vinyl wall covering, if used, shall be type 2 (medium duty), class A, with 21 oz./lineal yard weight. Contractors shall propose colors, textures and locations.

4.3.15.2.6.3 Ceramic Tile

Ceramic tile shall be used on all walls in restrooms and janitor's closets. Tile shall extend from floor to ceiling, and shall be provided behind and on the side of water closets and urinals, and on all walls within all janitor closets.

4.3.15.2.6.4 Exposed CMU Block

Exposed concrete masonry unit (CMU) walls shall receive a block filler and two finish coats. Exposed concrete block for interior spaces shall have a sealed, integral color. Exposed painted block for interior spaces is permitted only in approved utilitarian spaces. Bullnose shapes shall be used at all exposed corners and doorways unless furred with gypsum or finished with tile.

4.3.15.2.7 Edge and Corner Guards

Provide aluminum or stainless steel corner guards at all outside wall corners of gypsum board walls in corridors and restrooms. Top of edge guards shall be a minimum of 6'-0" above finished floor. Bottom of guard shall be to floor in areas of no base and to top of base at all other areas. Corner guards shall be mechanically fastened at top and bottom, and shall be otherwise adhered according to manufacturer’s recommendations.

4.3.15.3 Roofs

Roof materials, regardless of type provided, shall be Class A with a minimum twenty-five (25) year warranty, and shall have snow and ice guards on all roof surfaces.

4.3.15.3.1 Standing Seam Metal Roof

Contractors may provide a standing seam metal roof (SSMR), minimum slope 4 inch in 12 on the Administration and Explosive Processing and Machining modules. If provided, use a UL 90 architectural standing seam roof assembly that conforms to the Picatinny Arsenal Installation Design Guide for the building roof area. The seams shall be a minimum of 1" (25 mm) high and 12" to 24" (300 to 600 mm) on center. Roof system shall incorporate a fully concealed fastening system. Color shall be factory applied anodized bronze. Mechanical equipment shall not be located on the pitched roof areas. SSMR system shall account for the effects of ice dams and shall not drain to pedestrian walkways or parking areas.

4.3.15.3.2 Single Ply Membrane Roof Systems

Contractors must provide an ethylene propylene diene monomer (EPDM) roof assembly for the Explosive Storage component, and may provide this system or other single ply membrane roof systems for the other components, such as thermoplastic polyolefin (TPO), if desired. The roofing system proposed must have a demonstrable durability and must be approved by the Contracting Officer. EPDM roofs must comply with UFGS 07530, ETHYLENE PROPYLENE DIENE MONOMER (EPDM) ROOF MEMBRANE. EPDM roof shall be a fully adhered or mechanically fastened system applied over a minimum of two layers of rigid board roof insulation. Ballasted systems shall not be used. Mechanically fastened systems shall incorporate an air barrier in the roof assembly. Where an air barrier is required, it shall be applied at the deck level or within the insulation sandwich. Air barriers shall be specified in Section 07220 ROOF INSULATION. No mechanical equipment may be roof mounted if EPDM roofing is used. Membrane thickness shall be 1.1 mm minimum for mechanically fastened systems, and 1.5 mm otherwise. Membranes other than EPDM shall comply with UFGS 07515, PROTECTED MEMBRANE ROOFING (PMR).

4.3.15.3.3 Asphalt Roofs

Contractors may provide an asphalt applied, four-ply felt, built-up roof membrane system for the Administration component only, if shown to be architecturally compatible with the other components. Asphalt roof systems shall comply with UFGS Specification 07511, ASPHALT BUILT-UP ROOFING. Ballasted asphalt roofing systems are not allowed.

4.3.15.3.4 Shingled Roofs

Contractors may provide an asphalt shingle roofing system for the Administration component only, if shown to be architecturally compatible with the other components. Shingles shall be fungus-resistant and shall meet the fire resistance requirements of UL 790 for Class A and the wind resistance requirements of UL 997. Shingles shall be compatible with the Picatinny Arsenal Installation Design Guide for color, weight and composition, as appropriate. Systems shall include all required felts, underlayments, adhesives, fasteners, and vents as required by the shingle manufacturer. Such roof systems shall comply with UFGS Specification 07311, ASPHALT SHINGLES.

4.3.15.3.5 Covered Walkways

Provide covered walkways from each component to the others. Walkways shall be of similar wall and roof construction to match the facility to which adjoined. Walkways shall be covered with a tan tinted transparent panel system designed to withstand wind loads, serve as a weather break, and keep out insects. Walkways shall be lighted as specified in the Electrical section of this RFP. Ceilings may be gypsum board or painted exposed structure. NOTE: As part of Option 1, provide a covered walkway from the new facility to Building 225. Covered walkways are not required to provide shelter over roadways.

4.3.15.3.6 Access Hatches and Roof Hatches

Access hatches and roof hatches shall be of steel or aluminum frame type with pneumatic operators, minimum of 36″ x 36″ size, with keyed locking device and padlock at roof hatches. Roof hatch curbs and cover are to be thermally insulated.

4.3.15.4 Doors and Windows

Doors shall comply with UFGS 08210, WOOD DOORS, UFGS 08110, STEEL DOORS AND FRAMES, and UFGS 02120, ALUMINUM DOORS AND FRAMES, as applicable. Door hardware shall comply with UFGS 08710, DOOR HARDWARE. All door openings shall be a minimum of 3'-0" wide by 7'-0" high, unless otherwise specified. All doors and frames in the Explosive Processing and Explosive Machining components, and in the Explosive Storage component shall be connected to the building ground system. All doors in the explosive processing bays and magazines will open out into the walkway. Under no circumstances shall an operator be required pull a door open to exit a room containing explosives, for emergency purposes. All doors and frames in the Explosive Processing and Explosive Storage components shall be connected to the building ground system. All doors in the explosive processing bays and magazines will open outward, into the walkway. Under no circumstances shall an operator be required pull a door open to exit a room containing explosives for emergency purposes. NOTE: Blast resistant doors are not required on frangible walls.

4.3.15.4.1 Interior doors

Interior door and frame assemblies shall be ANSI/SDI-100 Grade II, Model 2, heavy-duty seamless insulated hollow steel doors with welded steel frames. As required by NFPA 101 or other governing codes,

lites shall be of tempered or wired glass, as required by code or as specified in this RFP. Doors shall comply with UFGS 08110, STEEL DOORS AND FRAMES, and shall have core construction as required by the manufacturer for interior doors. The contractor shall provide all necessary hardware for all doors. All interior doors shall have keyed locks, with the exception of offices and toilet rooms. All doorframes shall be flush with surrounding walls and seams shall be sealed except doors in gypsum-framed or tiled walls, which shall be wrap-around. Contractor shall paint all interior doors and frames (color to be specified by Picatinny Arsenal DPW) as specified for metal herein. Install tempered glass lites at office locations. All steel doors shall have steel frames. Door and frame assemblies shall meet the requirements for sound ratings as part of the wall assembly. Where specified, STC ratings of 45 shall include doors and frames.

4.3.15.4.2 Exterior doors

Exterior door and frame assemblies shall be ANSI/SDI-100 Grade II, Model 2, heavy-duty G60 galvanized (minimum) seamless insulated hollow steel doors with steel frames. As required by NFPA 101 or other governing codes, windows shall be of tempered glass. Doors shall comply with UFGS 08110, STEEL DOORS AND FRAMES, and shall have core construction as required by the manufacturer for insulated exterior doors. The contractor shall provide all necessary hardware for all doors. All exterior doors shall have keyed locks, as specified in this RFP, with deadbolt locking mechanisms. All exterior doors shall open outward. All doorframes shall be flush with surrounding walls and seams shall be sealed. Contractor shall paint all exterior doors and frames (color to be specified by Picatinny Arsenal) as specified for metal herein. Install half plate/half wired glass at exterior locations except mechanical rooms and main entrance to Administration component. Mechanical room doors shall not have glass. Main entrance doors shall be a minimum 14-gage steel storefront type. All steel doors shall have steel frames. All doors, frames and hardware shall be capable of withstanding heavy-duty use. For all exterior doors the contractor shall provide a commercially manufactured threshold with a vinyl or silicone rubber weatherstripping insert in the face of the stop. Weatherstripping shall be held in an extruded non-ferrous metal housing. All exterior doors shall have heavy-duty closers. Closers shall be top flush end and bottom flush or recessed channel, Grade 1, with brackets, arms, mounting devices, fasteners, pivots, and other features necessary for the particular application. The contractor shall size closers in accordance with the specific door application and size, and with manufacturer's recommendations.

4.3.15.4.3 Fire Doors

Doors required to have a fire resistance rating shall conform to the requirements of UL 10B, ASTM E 152, or NFPA 252 for the class of door required. The contractor is responsible for determining where fire rated doors are required. Affix a permanent metal label with raised or incised markings indicating testing agency's name and approved hourly fire rating to hinge edge of each door.

4.3.15.4.4 Overhead Doors

Overhead doors shall be provided as located on the plans. Overhead doors shall be spring counterbalanced, rolling type, with interlocking slats, complete with guides, fastenings, hood, brackets, and operating mechanisms, and shall be designed for use on openings as indicated. Overhead doors shall comply with UFGS section 08330, OVERHEAD DOORS, for heavy-duty use.

4.3.15.4.5 Hardware

Door hardware shall be coordinated with the functional and security requirements required by the criteria. Door hardware shall meet the minimum requirements of USGS Specification 08710, DOOR HARDWARE. All hardware shall be heavy-duty, shall conform to Builders Hardware Manufacturers Association (BHMA) criteria and shall be Grade 1. Finish shall be brushed chrome. All hardware shall be installed in accordance with the manufacturers published instructions. Panic hardware in egress routes shall be provided as required by the Life Safety Code and other fire codes. See specific locking requirements below. Each door must have the following hardware as a minimum.

One and one half pair of metal butt hinges
One floor or wall, as appropriate, mounted doorstop
Locks (see below)
Lever latch handles
Exit devices, as required by code
Thresholds for all exterior doors

Exterior doors and interior doors shall have a mortise lockset. All lock cylinders shall have at least seven pins and have removable cores. Lock cylinders shall be 100% compatible with existing Picatinny Arsenal lock system, which was manufactured by BEST. All locksets shall have four keys provided. All locksets shall be keyed to one master key system. NOTE: No master key system exists for the "High Security" locks used in the processing bays. Door closers shall be in accordance with ANSI A156.4 and NFPA 80 Fire Doors and Windows. Kickplates are required on all interior doors. Hinges shall be non-removable pin type for exterior doors and reverse-bevel for interior doors, such that pins will be non-removable when door is closed. Other antifriction bearing hinges may be provided in lieu of ball-bearing hinges. Thresholds shall comply with all accessibility requirements of Accessibility Guidelines for Buildings and Facilities.

4.3.15.4.6 Toilet Room Stall Partitions

Restroom stalls shall comply with UFGS Specification 10153, TOILET PARTITIONS. Partitions shall be Type I, floor supported, ceiling hung, overhead braced or overhead braced-alcove. Width, length, and height of toilet enclosures shall be per manufacturer’s recommendation. Finish surface of panels shall be painted metal, phenolic resin or laminated plastic (Finish 3). Panels to receive toilet paper holders or grab bars as specified in Section 10800 TOILET ACCESSORIES, shall be reinforced for mounting of the items required. Each stall shall receive a swinging door with barrel bolt closure. All hardware, to include handles, grab bars, brackets, nuts, bolts, screws, etc., shall be stainless steel.

4.3.15.5 Windows

Approximately 2% of the total exterior wall surface shall be provided with fenestration, not counting the exterior walkways. Windows shall be provided in the Administration component, and on a limited basis in other areas. Proposed exterior window system shall be a manufacturer's standard product that meets the minimum requirements of UFGS Specification 08510, STEEL WINDOWS or 08520, ALUMINUM WINDOWS. Install new anodized aluminum or painted steel framed windows with valance. Operable windows shall be provided with insect screens, and shall be capable of opening to provide adequate natural ventilation. Windows shall be a commercial or institutional grade and shall include head and sill flashing. Glazing and frames shall also be in accordance with UFGS Specification 08800, GLAZING. If not otherwise specified, exterior glazing shall be laminated double pane, fixed, sealed airtight, with a minimum ½ inch air space, low-E coating, with lamination on appropriate surface to protect occupants in Administration area. Seal all joints between window frame and building. All windows and joints shall be watertight. Frame color shall be natural aluminum or anodized white or off-white. Interior glazing shall be single pane, tempered if required, with lamination on appropriate surface to protect occupants from blow-out fragments, and shall be sealed. All steel window frames installed in masonry shall be grouted solid with mortar.

4.3.15.5.1 Blinds

Blinds shall be provided for all exterior windows in the Administration component only. Blinds shall be of the horizontal metal louver type, 1″ slats, operable, with an off-white outer surface color.

4.3.15.6 Ceilings

Ceilings installed in the Administration component rooms shall be a minimum of 9′-0″ clear height to the underside of all lighting fixtures or other equipment. Ceilings in the Explosive Processing and Explosive Machining components shall be a minimum 12′-0″ clear height to the underside of all structure elements, mechanical equipment or lighting fixtures, and 10′-0″ clear height to the underside of all other equipment, including cranes.

4.3.15.6.1 Gypsum Board

Painted gypsum board ceilings shall have a smooth texture. Gypsum board ceilings are permitted in toilet rooms, closets, janitor’s closets, utility spaces and as soffits. Gypsum board ceilings may be provided in the enclosed walkway. Gypsum board ceilings shall comply with the requirements in UFGS 09250, GYPSUM BOARD. Gypsum board ceilings shall be painted similar to the requirements of Walls above. Use Type X in fire-rated walls and moisture-resistant in wet areas.

4.3.15.6.2 Acoustical Ceilings

Suspended acoustical tile ceilings shall be 24" x 24" x 3/4". Acoustic ceiling tile is required throughout the Administration component except as allowed in this RFP. As a minimum, suspended acoustic ceiling tile systems shall comply with UFGS 09510, ACOUSTICAL CEILINGS. Acoustical ceilings shall be installed subsequent to

required mechanical and/or electrical work. Ends of all grips in ceiling grids shall be fastened securely to adjacent suspension members for rigidity and strength using mechanical fasteners. Grid members that adjoin walls shall be securely fastened using rivets, screws or other appropriate fasteners. Ceiling grids shall be capable of supporting all necessary lighting fixtures and mechanical registers.

4.3.15.6.3 Exposed Structure Ceiling

Exposed structure ceilings may be used in the Explosive Processing, Explosive Machining and Explosive Storage components, and as specified in the room-by-room requirements. Where spaces are moisture-prone or fire-rated, exposed structural members shall be protected accordingly. Exposed structural ceilings shall be painted similar to Metals above.

4.3.15.7 Flooring

4.3.15.7.1 Resilient Floors

Floors in the Administration component, except as otherwise required, shall be vinyl composition tile, sheet vinyl, rubber tile, or rubber sheet flooring that complies with UFGS Specification 09650, RESILIENT FLOORING. Floors shall be adhered according to manufacturer’s recommendations. Base shall rubber, thermoplastic rubber or thermoplastic vinyl, coved. Base shall be 4 inches high and a minimum 1/8-inch thick, with preformed outside corners in matching height, shape, and color.

4.3.15.7.2 Conductive Vinyl Flooring

Conductive vinyl flooring is required in all of the remote control rooms, and shall comply with UFGS Specification 09660, CONDUCTIVE VINYL FLOORING. Conductive vinyl tile shall be Type III, adhered as recommended by the manufacturer. Tile shall be 12″ x 12″ or 24″ x 24″, with heat-welded seams 1/8 inch thick. Base shall be rubber or vinyl, coved. Base shall be 4 inches high and a minimum 1/8-inch thick, with preformed outside corners in matching height, shape, and color.

4.3.15.7.3 Conductive and Spark Resistant Flooring

All machining shops, processing rooms, overnight explosive storage areas, explosive magazines, or other locations where explosives are handled, shall be protected with a conductive spark resistant flooring material that complies with UFGS Specification 09965, METALLIC TYPE CONDUCTIVE/SPARK RESISTANT CONCRETE FLOOR FINISH. Assemblies shall be anti-static with copper ribbon grounding strips encased in epoxy, with concrete substrate, at spacing as required by the referenced guide specification.

4.3.15.7.3 Ceramic Tile Floors

Ceramic tile floors shall comply with UFGS Specification 09310, CERAMIC TILE, QUARRY TILE, AND PAVER TILE, and shall be installed in all toilet rooms, janitor’s closets, showers and break room wet areas. Provide slip resistant tile where appropriate. In showers, ceramic

wall tile may be installed over cement board over metal stud framing or over a setting bed. Cove base shall be of matching tile, integral turns, and shall transition to wall tile without surface change.

4.3.15.7.4 Carpeting

Carpeting shall be installed in the Administration component in the Administration component Conference Room. Carpet shall be first quality, durable, free of visual blemishes, streaks, poorly dyed areas, fuzzing or pilling of pile yarn, spots or stains, and other physical and manufacturing defects. Carpet materials and treatments shall be reasonably non-allergenic and free of other recognized health hazards. All grade carpets shall have a static control construction that gives adequate durability and performance. Carpet shall bear the Carpet and Rug Institute (CRI) Indoor Air Quality (IAQ) Label. Carpet shall be soil and stain resistant. Colors and patterns shall be non-linear and non-geometric, and shall comply with the Picatinny Arsenal Installation Design Guide. Base shall be rubber, thermoplastic rubber or thermoplastic vinyl, straight. Base shall be 4 inches high and a minimum 1/8-inch thick, with preformed outside corners in matching height, shape, and color.

4.3.15.7.5 Concrete Sealer

Concrete floors are permitted in the Explosive Processing, Explosive Machining and Explosive Storage components, but have specific requirements for sealing as denoted above. Where a floor finish, such as carpet, tile, or painted floor coating is not specified, exposed concrete floors shall receive two coats of a durable clear sealer. Sealer thickness shall be in accordance with manufacturer’s recommendations. The Contractor is solely responsible for verifying that any concrete additives or curing compounds are compatible with proposed and required floor sealers and conductive flooring products.

4.3.15.8 Cabinets

As a minimum, cabinets shall be custom grade in accordance with AWI, hardwood veneer or plastic laminate over medium density fiberboard (MDF), per AWI custom grade standards. Interior cabinet finishes may be plastic laminate or finished stained wood. Cabinetry shall comply with UFGS Specification 06410, LAMINATE CLAD ARCHITECTURAL CASEWORK.

4.3.15.8.1 Cabinet Finish

The finished material of exposed fronts and ends of cabinets, door and drawer fronts shall be plastic laminate or stained wood. Metal cabinets will be permitted in locations where chemicals may be stored. Cabinet finish shall be a light color.

4.3.15.8.2 Cabinet Hardware

Cabinet hardware shall conform to ANSI 156.9. Cabinet hinges shall be concealed offset and spring-loaded, "European" style, commercial grade. Cabinet drawer guides shall be a minimum of 20 gage steel with double rollers, heavy duty commercial type.

4.3.15.9 Countertops

4.3.15.9.1 Ceramic Tile

Ceramic tile countertops are not permitted.

4.3.15.9.2 Plastic Laminate

Countertops in break rooms may be of high pressure laminated plastic, with heat resistive adhesive, fully formed with a continuous sheet of plastic. Provide no-drip bull nose edges with integral coved backsplash where appropriate. Ninety degree glued horizontal counter edges are not permitted.

4.3.15.9.3 Countertops in Toilet Rooms

Restroom vanity tops may be plastic laminate or solid resinous materials. Exposed outside corners shall be filleted, chamfered or radius profiles.

4.3.15.10 Lockers

Steel lockers shall be provided in each of the toilet rooms in the Administration component. A minimum of five (5) lockers, which comply with UFGS Specification 10505, STEEL CLOTHING LOCKERS, shall be located in each toilet room, away from all toilet fixtures and sinks. Lockers shall be Type I, single-tier, shelved, with finish colors to accent surrounding walls. Lockers shall include hinged metal doors capable of being locked using standard sized padlocks. Clothing hooks shall be provided on each side of the interior of each locker. Benches shall be provided between rows of lockers or along the full length of wall lockers.

4.3.15.11 Signage

4.3.15.11.1 Facility Signage

Provide signage throughout the facility (interior, exterior, and site) in accordance with the Picatinny Arsenal Installation Design Guide. Adjacent to the door opener side of each interior door, rooms shall have framed signs designating the office number. The signs shall be approximately 3″ x 6″ and shall be of standard manufacture, made of high impact plastic. Frames shall be either molded plastic or aluminum, with brushed finish. Frames shall be attached to the wall using mechanical fasteners. Removable letters are required to allow addition of office occupants and titles. Contractor shall provide adequate spare letters to accomplish the addition of all building occupant names and titles with the project. Letters shall be approximately 1″ in height, and shall adhere to the signs without using additional glues or other adhesives.

4.3.15.11.2 Building Identification

Building identification shall be in accordance with Picatinny Arsenal Installation Design Guide.

4.3.15.12 Painting

4.3.15.12.1 General

All surfaces shall be painted with the exception of the following: walls/ceilings in crawl spaces and concealed areas, sprinkler heads, hardware, fittings, exterior galvanized surfaces, and other factory finished items. Ceilings, walls and floors shall be waterproof in areas where deluge sprinkler heads are present.

4.3.15.12.2 Metal

Painting shall comply with UFGS 09900, PAINTS AND COATINGS. All exterior and interior metal shall be painted. Surfaces shall be cleaned of rust and dirt before painting. Paint system shall be one coat of rust inhibitive primer and two coats of finish for all surfaces that are not painted. Surfaces that are already painted shall be cleaned and painted with adequate coats to provide uniformity with newly painted surfaces. Finish coat paint shall be an alkyd base paint. Color shall be as specified by the Picatinny Arsenal DPW.

4.3.15.12.3 Piping

Paint all exposed horizontal and vertical piping, downspouts and gutters on each component. Paint shall be the same system as specified for metal above. Color shall closely match the building colors, or as specified by the Picatinny Arsenal DPW.

4.3.15.13 Miscellaneous

4.3.15.13.1 Wood

The use of wood shall be limited to interior doors, shelves and cabinetry, minor wall accents, chair rails, baseboards, telephone backboards and unexposed treated roofing nailers.

4.3.15.13.2 Handrail System

Exterior and interior handrail systems shall be a custom prefabricated, factory finished railing system. A detached, floor- or ground-mounted painted steel railing assembly (guardrail) shall be placed continuously along all exterior EIFS surfaces where loading, forklift operations, etc., occur, to protect the doors, frames and EIFS exterior finish.

4.3.15.14 Specialties and Furnishings

4.3.15.14.1 Toilet Accessories

Toilet accessories as described below shall be provided in all toilet rooms. Janitor’s closets, if provided, shall contain a mop sink. All toilet accessories shall be stainless steel or chrome finished steel/brass. Provide all toilet fixtures as identified in the Mechanical part of this section. Toilet accessories shall comply with UFGS 10800, TOILET ACCESSORIES.

4.3.15.14.1.1 Mirrors

Mirrors of ¼″ minimum thickness shall be provided over each sink in all toilet rooms. Size shall be approximately 18″ wide x 30″ high. Mirrors shall be securely fastened to the wall using mechanical fasteners, and shall not be hung or hooked. Mirrors shall have stainless steel or brass frames by which they are fastened to the walls. At least one tilted mirror, to comply with accessibility requirements, shall be provided in each toilet room.

4.3.15.14.1.2 Paper Towel Dispenser

Two lockable paper towel dispensers shall be provided in each toilet room. Dispensers shall be constructed of stainless steel, and shall be surface mounted.

4.3.15.14.1.3 Sanitary Napkin Disposer and Sanitary Napkin/Tampon Dispenser (Women’s toilets only)

One lockable stainless steel sanitary napkin disposer shall be provided with each women’s room toilet stall. Disposers shall have leak-proof disposable type liners. Disposer shall be provided with a door for inserting disposed napkins, and shall be partition mounted. One lockable sanitary napkin and tampon dispenser shall be provided in each women’s room toilet stall. Dispenser shall be surface mounted, made of stainless steel and shall have a minimum capacity of 20 each.

4.3.15.14.1.4 Soap Dispenser

One liquid-type soap dispenser, with stainless steel tank, shall be provide for each sink, and shall be surface mounted with mechanical fasteners.

4.3.15.14.1.5 Toilet Tissue Dispenser

One two-roll stainless steel toilet tissue holder shall be provided in each toilet stall, and shall be surface mounted with horizontal dispensing.

4.3.15.14.1.6 Waste Receptacle

Two steel waste receptacles shall be provided in each toilet room. Receptacles shall be designed for surface mounting or free standing, painted, with reusable liner. Capacity shall be not less than 4 cubic feet.

4.3.15.14.1.7 Showers

Showers are to be provided as indicated on the drawings. Showers shall receive a stainless steel rod and anti-bacterial vinyl or nylon shower curtain in lieu of doors. Colors shall be as determined by the Contracting Officer. Shower rooms will require the following accessories, which shall comply with UFGS 10800, TOILET ACCESSORIES.

4.3.15.14.1.7.1 Soap Holder

Soap holder shall be surface-mounted, mechanically fastened stainless steel. Separate supports, if required, shall be stainless steel.

4.3.15.14.1.7.2 Towel Bar

Towel bar shall be stainless steel, minimum 19 mm (3/4 inch) diameter, and shall be outside the shower stall at a convenient location.

4.3.15.14.1.7.3 Benches

Small benches shall be provided at each shower. Benches shall be water resistant and durable. Wooden benches are not permitted. If metal is used, it shall be rust and mildew resistant in its design. Color shall be compatible with surrounding tile.

4.3.15.14.1.8 Grab Bars

Grab bars shall be installed as required to meet accessibility requirements. All grab bars shall be stainless steel. Grab bar shall be form and length as indicated, with concealed or exposed mounting flanges. Grab bars shall have peened non-slip surface.

4.3.15.15 Fire Extinguishers

Fire extinguishers shall be provided as required by criteria. A minimum of one fire extinguisher per room shall be provided in the Explosive Processing, Explosive Machining and Explosive Storage components. Fire extinguishers shall be of the ABC type. All fire extinguishers shall be mounted to the wall in surface-mount or semi-recessed cabinets.

4.3.15.16 Dry-erase Presentation Boards (Whiteboards)

One (1) dry-erase presentation board (whiteboard) shall be installed in each private office and in all conference rooms. The presentation board shall be in a wall-hung cabinet with piano-hinged double doors. The doors shall have a catch or closure to keep doors closed when not in use. The writing surface shall be porcelain enamel, and shall include a marker tray and fabric-covered tack surface on the inside of the doors. The cabinet shall have a stained hardwood finish. Dry erase markings shall be removable with a felt eraser or dry cloth without ghosting.

3.4.15.17 Janitor’s Closet

One (1) mop hanger capable of holding a minimum of 4 mops shall be provided in each janitor’s closet. Additionally, a 12 inch metal shelf shall be provided on at least one wall at a height of approximately 5’-0”.

4.4 SPECIFIC COMPONENT REQUIREMENTS

Contractors must provide space as required in the Room-by-room Requirements included in this RFP. If specific equipment or other design elements require the addition of square footage to the Mechanical and/or Electrical Rooms, the Contractor shall include the required area as part of the initial proposal. Mechanical, electrical and communication rooms shall be located centrally, if possible, to minimize duct runs and connections.

4.4.1 Administration Component

The Administration component shall have exterior walls and finishes that are architecturally compatible to the rest of the facility.

4.4.2 Explosive Processing and Explosive Machining Components

It is important to note that explosive materials may be stored overnight in the Explosive Processing and Machining component in the machine shops and in all processing rooms. Forklifts will be used in these components, including in the enclosed walkways.

4.4.2.1 Substantial Dividing Walls

The Explosive Processing and Machining component requires compartments as indicated on the drawings. The roof, sidewalls, doors and ceilings shall be designed to blow out in case of an incident but must meet security requirements of AR 190-11, Physical Security of Arms, Ammunition and Explosives. The wall thickness for this component shall be designed for the minimum acceptable. The Contractor's design must comply with all criteria. The Contractor's design and construction of concrete dividing walls shall comply with the requirements in this RFP and the Memorandum Clarifying Substantial Dividing Walls (SDU).

4.4.2.2 Wall Construction

Interior of these components shall be concrete masonry units (CMU), gypsum wallboard on metal studs, concrete or other construction deemed necessary to comply with the referenced standards, particularly DA Pamphlet 385-64 and AMC-R 385-100. Substantial dividing walls and blast resistant doors are required in some areas. Wall types, thicknesses, and layouts indicated in drawings are considered the minimum acceptable; however, the Contractor is fully responsible to provide as part of the bid all necessary structural requirements that may be over and above the minimum acceptable indicated on the drawings in order to fully comply with all referenced design standards. NOTE: Blast resistant doors are not required on frangible walls.

4.4.2.3 Explosive Weights

The net explosive weights stored in each of the magazines are indicated in the Room-by-room Requirements. Limits are stated as TNT equivalents. All equipment/weights shall be located 3 feet minimum from the perimeter walls.

4.4.2.4 Thresholds

Floor and walkway elevations on each side of the door thresholds shall be equal to facilitate moving equipment on handcarts. Thresholds shall not be provided between the covered walkway and the processing rooms or storage magazines. Thresholds shall also meet all accessibility requirements.

4.4.2.5 Flow-through Process

The Explosive Processing and Explosive Machining components must be designed to include the flow-through process of its sequential operation. The machining and processing rooms shall have a clear span from exterior wall to exterior wall (no interior columns).

4.4.2.6 Exterior Enclosed Walkway

The exterior of the building shall have enclosed walkways to allow forklifts and personnel to move between this and the other components without being subject to the elements and to keep out insects. This walkway, on the blast side of the facility, will also be utilized as the utility corridor and should be substantial enough to support the necessary mechanical pipes, equipment, ducts, etc. The walls of this enclosure shall be as translucent as possible, using double-faced plastic panels or similar elements.

4.4.2.7 Loading Docks

Loading docks shall be provided as shown on the drawings. Provide ramp and load dock face with heavy duty laminated rubber, tire-fabric, or equivalent dock bumpers.

4.4.2.8 Laundry

The Laundry shall contain the following elements: janitor-type mop sink, space for side-by-side commercial grade washer and dryer with appropriate hook-ups, floor drain, and either a recessed overflow sump with pink water collection or a stainless steel containment tub to collect and drain washer water to the pink water drainage system. Shelves 12 inches deep shall be provided above the washer/dryer areas. At a logical location, preferably hidden from view, a mop holder shall also be provided.

4.4.3 Explosive Storage Component

The Explosive Storage component includes four (4) magazines, each 14’-0” by 14’-0” with 12’-0” clear ceiling height. The Explosive Storage component requires compartments as indicated on the drawings. Explosive materials may be stored overnight in this component. Each bay shall have an explosive limit as specified in the Room-by-room Requirements or the Structural section of this RFP.

4.4.3.1 Blow-out Design

The roof, sidewalls, doors and ceilings of shall be designed as required in the Structural section of this RFP, and shall comply with the security requirements of AR 190-11, Physical Security of Arms, Ammunition and Explosives.

4.4.3.2 Substantial Dividing Walls

The wall thickness for this component shall be designed for the minimum acceptable. The Contractor's design must comply with all criteria. The Contractor's design and construction of concrete dividing walls shall comply with the requirements in Memorandum Clarifying Substantial Dividing Walls (SDU).

4.4.3.3 Interior Finishes

The interior finishes of the Explosive Storage component shall be bare concrete. The bare concrete surfaces shall be finished with two coats of concrete sealer.

4.4.3.4 Explosive Weights

The net explosive weights stored in each of the magazines are indicated in the Room-by-room requirements. Limits are stated as TNT equivalents. All equipment/weights shall be located 3 feet minimum from the perimeter walls.

4.4.3.5 Exterior Enclosed Walkway

The exterior of the building shall have enclosed walkways to allow personnel to move between this and the other components without being subject to the elements. This walkway may also be utilized as the utility corridor and, if so used, should be substantial enough to support the necessary mechanical pipes, equipment, ducts, etc. The walls of this enclosure shall be as translucent as possible, using double-faced plastic panels or similar elements.

4.4.3.6 HVAC

The Explosive Storage component shall be heated and/or ventilated as required in the Mechanical section of this specification.

4.4.3.7 Thresholds

Floor/walkway elevations on each side of the doors shall be equal to facilitate moving equipment on handcarts. Thresholds shall also meet all accessibility requirements.

4.4.4 Option 1, Building 225

As an option to the contract, contractors shall propose costs involved with the upgrade of Building 225, Explosives Machining Facility. The upgrade shall include the following items.

4.4.4.1 Asbestos-containing Materials (ACM) and Lead-based Paint (LBP)

The contractor shall conduct ACM and LBP surveys, abatement and disposal. All surveys, abatement and disposal shall be in accordance with UFGS Specification 13280, ASBESTOS ABATEMENT and 13283, REMOVAL/CONTROL AND DISPOSAL OF PAINT WITH LEAD. Disposal, if necessary, shall be done by the contractor in accordance with local and State laws and regulations in an approved landfill.

4.4.4.2 Demolition

The contractor shall be responsible for all required demolition to the existing facility, to include, but not be limited to, removal of existing siding, substrate, insulation, roof, doors, windows, gutters, downspouts, etc. Proper disposal of all materials shall be the responsibility of the contractor.

4.4.4.3 EIFS

Building 225 shall have an exterior insulation finish system (EIFS) applied to all exterior surfaces that are visible from the adjacent 5th Avenue (3 sides). All existing penetrations, surface applied components, etc, shall be removed and replaced as necessary to allow application of EIFS. The exterior siding, sheathing and wall insulation shall be removed and discarded. The EIFS shall comply with UFGS Specification 07240, EXTERIOR INSULATION AND FINISH SYSTEM. System shall be PM Class high-impact resistant, medium finish, color as allowed in the Picatinny Arsenal Installation Design Guide. EIFS shall be a job-fabricated exterior wall covering consisting of all required sheathing, insulation board, reinforcing fabric, base coat, finish coat, adhesive and mechanical fasteners, as applicable, to match the other components of this project. The system shall comply with paragraph 4.3.15.2.3 above.

4.4.4.4 Doors and windows

All exterior doors and windows, including trim, flashing, drips, etc., shall be removed and replaced using products and methods in compliance with paragraph 4.3.15.4, including subparagraphs, above, as applicable.

4.4.4.5 Covered Walkway

All other appropriate trim, including but not limited to, rain gutters, downspouts, roof flashing at edges, vents, conduit, supports, fasteners, building numbers, lighting fixtures, wiring, electrical boxes, shall be removed and replaced or reinstalled, as appropriate, to allow installation of EFIS system, doors and windows. If reinstalled, all elements shall be painted with 2 coats of matching exterior paint.

4.4.4.6 Other

All other appropriate trim, including but not limited to, rain gutters, downspouts, roof flashing at edges, vents, conduit, supports, fasteners, building numbers, lighting fixtures, wiring, electrical boxes, shall be removed and replaced or reinstalled, as appropriate, to allow installation of EFIS system, doors and windows. If reinstalled, all elements shall be painted with 2 coats of matching exterior paint.

END OF PART 4

PART 5 STRUCTURAL DESIGN

5.1 DESCRIPTION

The structural design criteria shall be used for structural loading, design, and installation. The following criteria shall be used in conjunction with the technical specifications and references. The structural work consists of design and of construction but not necessarily limited to the following items

a. Building foundations
b. Concrete floor slabs
c. Load bearing and non-load bearing masonry walls
d. Load bearing reinforced concrete walls
e. Non-load bearing stud walls
f. Vertical framing members
g. Horizontal and truss framing members, including roof connection details
h. Expansion, construction, and contraction joints.
i. Attachment provisions for architectural, mechanical, and electrical elements.
j. Explosive safety

5.2 Specifications

The structural-related specifications listed in Part 11 shall be developed by the Contractor for use in the design and construction documents of this project.

5.3 REFERENCES

Design and installation shall conform to the listed editions of the references listed below, unless otherwise indicated. Unless otherwise specified or noted hereinafter, all design methods and allowable stresses for the various structural materials shall be in accordance with unified facilities criteria, engineering and technical manuals, codes and specifications, and technical instructions which includes but is not limited to the following. Recommendations made in the codes, specifications, and industry standards in this paragraph are requirements of this RFP, unless specified otherwise in these RFP documents. DA Pamphlet 385-64 (Dec.1999), AMC-R 385-100 (Sep.1995), and DOD 6055.9-STD (Dec 2002) shall be followed.

5.3.1 Unified Facilities Criteria (UFC)

UFC 3-310-01 Load Assumptions for Buildings (June 2000)

5.3.2 Technical Instructions (TI)

TI 809-02 Structural Design Criteria for Buildings (Sep. 1999)

TI 809-04 Seismic Design for Buildings (Dec. 1998)

TI 809-05 Seismic Evaluation Rehabilitation for Buildings (Nov. 1999)

TI 809-07 Design of Load Bearing Cold-Formed Steel Systems and Masonry
Veneer/Steel Stud Walls (Nov. 1998)

TI 809-26 Welding Guidance for Buildings (March 2000)

TI 809-27 (Former TM 5-809-12/Aug. 1987) Concrete Floor Slabs on Grade Subjected to Heavy Loads

TI 809-29 Structural Considerations for Metal Roofing (Aug. 1998)

TI 809-30 Metal Building Systems (Aug. 1998)

5.3.3 Technical Manuals (TM)

TM 5-809-3 Masonry Design for Buildings (Oct. 1992)

TM 5-809-29 Structural Considerations For Metal Roofing (Aug. 1998)

TM 5-1300 Structures to Resist the Effect of Accidental Explosions
(Nov.1990)

5.3.4 Codes and Specifications

All structural assemblies and structural materials shall be of a noncombustible nature. The exact type/classification of the building/building parts may be determined and submitted by the contractor after a code analysis.

General: International Building Code, 2003 Edition.

Structural Steel: Manual of Steel Construction by the American Institute of Steel Construction Inc., Load and Resistance Factor Design, Third Edition, 2001.

Concrete: Building Code Requirements for Structural Concrete by the American Concrete Institute, ACI 318-02 (Jan. 2002).

Welding: Structural Welding Code - Steel by the American Welding Society, AWS D1.1 (Jan. 2004) and D1.4 (Jan 1998).

Masonry: Building Code Requirements for Masonry Structures, ACI530-02 (May 2002)

Steel Joist and Deck: SJI Steel Joist Institute, SDI Steel Deck Institute (April 2001).

Loads: Minimum Design Loads for Buildings and Other Structures by the American Society of Civil Engineers, ASCE 7-02 (Dec. 2002).

Foundations shall be designed in accordance with recommendations of the Contractor-prepared Geotechnical Design Analysis.

AR 190-11, Physical Security of Arms, Ammunition, and Explosives where Necessary (Feb.1998).

5.3.5 Unified Facility Guide Specifications UFGS

UFGS 01452A Special Inspection for Seismic-Resisting Systems (Nov. 1999)

UFGS 02300 Earthwork (Aug. 2003)

UFGS 03100A Structural Concrete Formwork(May 1998)

UFGS 03101A Formwork for Concrete (Sep. 2001)

UFGS 03150A Expansion Joints, Contraction Joints, and Water stops (Sep.2003)

UFGS 03200A Concrete Reinforcement (Sep. 1997)

UFGS 03300 Cast-In-Place Concrete (Nov. 2001)

UFGS 03330A Cast-In-Place Architectural Concrete (March 2002)

UFGS 03413A Precast Architectural Concrete (May 1998).

UFGS 03450 Plant-Precast Architectural Concrete (Sep. 1999).

UFGS 04200 Masonry (Sep. 2003)

UFGS 04810 Nonbearing Masonry Veneer/Steel Stud Walls (Dec. 2002)

UFGS 05090A Welding, Structural (Dec. 2003)

UFGS 05120 Structural Steel (Aug. 2003)

UFGS 05210A Steel Joist (Dec. 2002)

UFGS 05310 Steel Decks (Oct. 2003)

UFGS 05400 Cold-Formed Metal Framing (Oct.2003)

UFGS 05500A Miscellaneous Metal (Jan. 2002)

UFGS 09965N Metallic Type Conductive/Spark Resistance Concrete Floor
Finish (Aug. 2001)

UFGS 13080 Seismic Protection for Miscellaneous Equipment (Sep.2003)

UFGS 13120 Pre-engineered Metal Buildings (Oct. 2003)

UFGS 13121 Metal Building Systems (Minor Requirements) (Oct. 2003)

UFGS 13420A Self-Acting Blast Valves (Nov. 1997)

UFGS 14630A Overhead Electric Crane (Nov. 2003)

UFGS 15070A Seismic Protection for Mechanical Equipment (Jan.2002)

UFGS 16070A Seismic Protection for Electrical Equipment (April 1999)

5.4 DESIGN LOADS

Design loads shall be included in the structural notes on the contract drawings.

a. Dead loads shall be calculated as required.

b. Live loads shall be in accordance with ASCE 7-02 unless noted otherwise, and as follows:

   Processing and machining bays - 150 lb/sq. ft. or concentrated equipment loads as directed in the Room By Room description, see Attachment A. Forklift traffic shall be allowed into all machining bays, processing bays and in the interior and exterior covered walkways (excluding the walkway to the satellite storage magazine) as well as in the loading dock area. The live load resulting from the forklift traffic shall match the maximum capacity plus the dead load of the preferred model HYSTER Electric Lift Truck Model E60XN-33 (See Attachment Q)

c. Roof snow load shall be in accordance with ASCE 7-02 unless noted
   otherwise.

d. Wind Pressures: American Society of Civil Engineers, ASCE 7-02;
   wind speed 105 miles/h; Exposure C; Importance Factor II

e. Seismic Loads in accordance with TI 809-04 with Seismic Use Group:
   I; Performance Level: LS(1); Ground Motion: 2/3 MCE(A); and Performance Objective: 1A. Seismic parameters for UFGS 13080, UFGS 15070A, and UFGS 16070A shall be calculated in accordance with TI 809-04.

5.5 GENERAL DESIGN CRITERIA

5.5.1 Building/Buildings

The building/buildings shall be designed, fabricated, and erected in accordance with the requirements of Unified Facilities

Guide Specifications (UFGS) and drawings. The Machining and Processing area(s) and explosive storage facilities shall also conform to the requirements of TM 5-1300, DA Pam 385-64, AMC-R 385-100, AR 190-11, DoD 6055.9-STD, and all applicable references.

5.5.2 Base Plate Bearing

Base plates shall be shimmed only with non-shrink grout.

5.5.3 Welds

In the Machining and Processing area and explosive storage facilities all exposed welds shall be continuous, ground smooth, and free of all pits and cracks. The finish shall be a No. 4 dairy polish on the interior surfaces (180 grit or better)

5.6 CONCRETE DESIGN

5.6.1 Structural Concrete

All structural concrete shall conform to UFGS 03300. Yet, it is the contractor’s decision to use precast or semi-pre-cast concrete components in accordance with UFGS 03450 and TM 5-1300. All foundation walls, footings, bay division walls, machining/processing roof units, enclosed walkways with forklift traffic, and floor slabs shall be reinforced concrete unless noted otherwise. The minimum concrete strength shall be 4000 psi, except for special flooring as referenced in paragraph 5.8 “SLABS ON GRADE”.

Contraction cavities, rock pockets or similar irregularities of the finished concrete surface texture shall be prevented.

5.6.2 Formwork

Formwork shall conform to UFGS 03100A Structural Concrete Formwork.

The formwork castings shall perform in such a manner to avoid any telegraphing through or buckling on the untreated concrete surface.

5.6.3 Expansion Joints, Contraction Joints, and Water stops

Expansion Joints, Contraction Joints, and Water stops shall conform to UFGS 03150A.

5.6.4 Maximum Expansion Joint Spacing

Maximum expansion joint spacing shall be 200 feet.

5.6.5 Reinforcing

Reinforcing shall conform to UFGS 03200A Concrete Reinforcement. Reinforcing shall be Grade 60. Indicate grade on the contract drawings in the structural notes.

5.6.6 Reentrant Corners

Reentrant corners in slabs shall be reinforced with a minimum of two #5 bars, 5 feet long, placed diagonal to the corner, except in blast areas. Additional reinforcement at openings and corners in blast areas shall be shown in especial details in structural drawings.

5.7 FOUNDATION DESIGN

The building foundations shall be designed to support all combinations of live, dead, seismic, wind, earth, and snow loads from the structure. Preliminary geotechnical sub-surface investigation has been performed for this project; see PART 3 of this SECTION. The contractor shall employ a qualified professional geotechnical engineering consultant to provide independent verification of the preliminary investigation results and recommendations and to make final design recommendations for building foundations. Foundation design shall be based on the provisions of this verification and any Contractor-performed investigations.

a. The footing depth from the bottom of footing to outside finish grade shall be in accordance to UFC 3-310-01, or as specified in Paragraph 3.6 of this SECTION, whichever is deeper.

b. Maximum allowable soil bearing pressure shall be determined by the Contractor during design. It shall be added after completion of the Geotechnical analysis and report.

c. Minimum width of footing shall be 18 inches.

d. Allowable soil bearing pressure and minimum footing depth shall be included in the structural notes on the contract drawings.

5.8 SLABS ON GRADE

Slabs on grade shall be designed for the loads provided above. Minimum slab thickness for all facilities shall be 4 inches unless required otherwise by TM 5-1300, DA Pam 385-64, and AMC-R 385-100. Minimum slab thickness in the machining, processing area as well as areas with expected forklift traffic shall be a minimum of 6 inches unless required otherwise by the applicable standards. Floor slabs subject to heavy loads and forklift traffic shall also be designed in accordance to TI-809-27 (former TM 5-809-12).

Slabs on grade shall be placed over a polyethylene vapor barrier and 6 inches thick capillary water barrier.

No column loads shall be transferred to the slabs on grade.

Shrinkage reinforcement shall be located 2.0 inches from the top of the slab. The percentage of steel shall not be less than 0.15 percent.

Sub floors, finished flooring, and work surfaces shall not wrinkle or buckle.

Coating or sealing material shall sustain decontaminate with high water/steam cleaners.

Exposed nails, screws or bolts in the work surfaces shall be avoided.

Floors, floor coverings, and floor treatments shall be noncombustible and anti-slip coated.

In all machining shops/process rooms/over night explosive storage cage/explosive storage magazines as well as the entire interior flooring area of the machining area the floor shall be designed as conductive floors in accordance with UFGS 09965N to prevent the source of an accidental ignition. Also the minimum structural concrete strength shall be 5000 psi as required by UFGS 09965N. (Note: The conductivity of the floor slab includes the reentrant wall corners.)

5.9 LOAD-BEARING MASONRY STRUCTURE

Load-bearing masonry structure shall be designed and constructed in accordance with the provisions of the International Building Code, 2003 Edition. Load-bearing masonry structure shall be designed to support all combinations of live, dead, seismic, snow, and wind loads and constructed in accordance with specification UFGS 04200.

5.10 Building Exteriors

Walls, floors and roof coverings of buildings regardless of function shall be noncombustible.

While it is recognized that wood may be the material of choice in a few applications, in general it is considered a combustible material, whether treaded or untreated for fire resistance, and should not be used in construction of this facility.

The building/buildings should be without basements and not more than one story high.

Any internal explosion shock wave shall be vented towards the mountainside. The walls directed to the mountainside of the building areas where energetic material is stored or handled shall function as a blow-out-wall and shall be of none load bearing character.

The blow-out-wall should appear to present an obstacle to intrusion into the building yet be lightly constructed to provide maximum venting for an internal explosion.

Construction method, material, and/or separation distances used shall be in accordance with DoD 6055.9-STD and prevent overpressure exciting more than 2psi in any control room, in the administrative offices or in any break rooms.

Blast protection to the exterior surrounding area of the Explosive Research and Development Loading Facility, will be provided by separation distances,(i.e. Q-D arches) or by protective structures, (i.e. barricades) The Q-D distances are defined in DOD 6055.9-STD and protective structures can be designed in accordance with TM 5-1300.

The possible progression of the shock waves shall be in alignment with the safety plan. Picatinny's safety officer of shall authorize the contractors design approach.

5.11 Building Interiors

Suspended ceiling shall not be used in machining or processing areas or where explosives are handled.

For none concrete roofs recommended practice is to install insulation and covering directly on the underside of the roof structure itself. Concrete roof slabs shall have an environmental cover above with insulation installed.

5.12 CONTAMINATED WASTEWATER COLLECTION TANK

The chemical compounds of the wastewater are listed in Attachment J. Although it may not be regulated at this time, to avoid future restrictions the wastewater shall be handled as hazardous waste with the waste code K047 in accordance with the New Jersey Department of Environmental Protection (NJDEP)

The contaminated wastewater collection tank may be situated below grade, to permit gravity drainage, with an adequate capacity to the maximum operational need according to the mechanical requirements. A secondary concrete containment shall be provided. The primary containment tank and secondary containment assembly (concrete vault) shall be designed and constructed in accordance with the New Jersey Administrative Code Title 7, Chapter 1E (N.J.A.C 7:1E), Discharge Prevention, Containment and Countermeasures/Discharge Cleanup and Removal (DPCC/DCR) regulations. The concrete vault shall be impermeable to passage or chemical attack by the wastewater under the conditions of storage privileges. Adequate space shall be provided to physically inspect the entire exterior of the primary tank.
See mechanical section "Contaminated Wastewater Collection System" for further requirements.

END OF PART 5

PART 6 MECHANICAL DESIGN

6.1 GENERAL

6.1.1 Mechanical Design, Analysis and Narrative

The Contractor shall submit the mechanical design, design analysis, and design narrative for the Explosives Research Development Loading Facility (ERDLF) in accordance with Section 01012.

6.1.2 Commercial Codes and Design Manuals

Design and installation shall conform to the latest editions of the references listed below, unless otherwise indicated herein.

AMC-R 385-100 Safety Manual (26 Sep 1995)

ANSI A13.1 Scheme for Identification of Piping Systems (1981)
ANSI Z358.1 Emergency Eyewash and Shower Equipment (1990)

Army Regulation AR 385-64 U.S. Army Explosives Safety Program (1 Feb 2000)

ASHRAE Cooling and Heating Load Calculation Manual (1992)
ASHRAE Fundamentals Handbook (2001)
ASHRAE HVAC Systems and Equipment Handbook (2000)
ASHRAE HVAC Applications Handbook (2003)
ASHRAE Guideline 12 Minimizing the Risk of Legionellosis Associated with Building Water Systems (2000)
ASHRAE 15 Safety Standards for Refrigeration Systems (2001)
ASHRAE 52.1 Gravimetric and Dust-Spot Procedures for Testing Air-Cleaning Devices Used in General Ventilation for Removing Particulate Matter (1992)
ASHRAE 55 Thermal Environmental Conditions for Human Occupancy (1992)
ASHRAE 62 Ventilation for Acceptable Indoor Air Quality (2001)
ASHRAE 70 Method of Testing for Rating the Performance of Air Outlets and Inlets (1991)
ASHRAE 90.1 Energy Standard for Buildings Except Low-Rise Residential Buildings (2001)

ASME A112.19.1M Enameled Cast Iron Plumbing Fixtures (1994)
ASME A112.19.2M Vitreous China Plumbing Fixtures (1998)
ASME A112.19.3M Stainless Steel Plumbing Fixtures: Designed for Residential Use (1987)
ASME B16.3 Malleable Iron Threaded Fittings,Classes 150 and 300 (1998)
ASME B31.1 Power Piping (2001)
ASME HST-2 – Performance Standard for Hand Chain Manually Operated Chain Hoists (1999)
ASME HST-5 - Performance Standard for Air Chain Hoists (1999)
ASME Section V Nondestructive Examination (2001)

ASTM A53 Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless (2002)

ASTM B88 Standard Specification for Seamless Copper Water Tube (2003)
ASTM D1193 Standard Specification for Reagent Water

Department of the Army Pamphlet 385-64 Ammunition and Explosives Safety Standards (15 Dec 1999)

DOD 6055.9-STD DOD Ammunition & Explosives Safety Standard (July 1999)

EM 385-1-1 Safety and Health Requirements Manual (3 Nov 2003)

International Code Council - International Building Code (IBC) (2003)
International Code Council - International Plumbing Code (2003)

Military Handbook 1190, Facility Planning and Design Guide

New Jersey Administrative Code Title 7, Chapter 1E

NFPA 10 Standard for Portable Fire Extinguishers (2002)
NFPA 13 Installation of Sprinkler Systems (2002)
NFPA 15 Water Spray fixed Systems for Fire Protection (2001)
NFPA 20 Centrifugal Fire Pumps (2003)
NFPA 24 Installation of Private Fire Service Mains (2002)
NFPA 25 Standard for the Inspection, Testing and Maintenance of Water Based Fire Protection Systems (2002)
NFPA 72 National Fire Alarm Code (2002)
NFPA 90A Installation of Air Conditioning & Ventilating Systems (2002)
NFPA 91 Installation of Blower and Exhaust Systems for Dust, Stock, and Vapor Removal or Conveying (1999)
NFPA 101 Life Safety Code (2003)
NFPA 291 Fire Flow Testing (2002)
NFPA 820 Fire Protection in Wastewater Treatment Plants (2003)

Picatinny Arsenal SOP#020 Disinfection of Water Mains

Plumbing & Drainage Institute PDI WH 201 Water Hammer Arresters(1992)

SMACNA Seismic Restraint Manual; Guidelines for Mechanical Systems (1998)
SMACNA HVAC Duct Construction Standards, Metal and Flexible (1995)

TI-800-01 Design Criteria (20 Jul 1998)
TI-800-03 Technical Requirements for Design Build (1 Jul 1998)
TI-809-04 Seismic Design for Buildings (31 Sep 1998)
TI-809-05 Seismic Evaluation and Rehabilitation for Buildings (Nov 1999)
TI-811-12 Utility Monitoring and Central Systems (18 Aug 1998)

UFC 3-400-01 Design: Energy Conservation (5 Jul 2002)
UFC 3-400-02 Design: Engineering Weather Data (28 Feb 2003)
UFC 3-410-01FA Design: Heating Ventilation and Air Conditioning (TI 810-10) (15 May 2003)

UFC 3-410-02A Heating Ventilation and Air Conditioning Control Systems (TI 810-11) (15 May 2003)
UFC 3-420-01FA Plumbing (TM 5-810-5) (15 May 2003)
UFC 3-420-02FA Compressed Air design (TM 5-810-4) (15 May 2003)
UFC 3-430-09N Design: Exterior Distribution of Steam, High Pressure Water, Chilled Water, Natural Gas, and Compressed Air (16 Jan 2004)
UFC 3-450-01 Design: Noise and Vibration Control (TM 5-805-4) (15 May 2003)
UFC 3-490-04A Design: Indoor Radon Prevention and Mitigation (TI-810-91) (15 May 2003)
UFC 3-600-01, Fire Protection Engineering for Facilities (16 Jan 2004)

UL 142 Standard for Steel Aboveground Tanks for Flammable and Combustible Liquids (11 Jul 2002)
UL 555 Standard for Fire Dampers (1 Jun 1999)
UL 900 Standard for Air Filter Units (28 Nov 1994)

6.1.3 Specifications

See Part 11 Specifications for a list of required specifications and general requirements.

6.2 HEATING, VENTILATION, AND AIR CONDITIONING

6.2.1 General Design Criteria

All areas of the Explosives Research Development Loading Facility (ERDLF) shall be heated, ventilated, air conditioned, and humidity controlled in accordance with the design requirements for each room. The heating, ventilation and air conditioning design shall be in accordance with UFC 3-410-01FA and this document.

Each room shall be individually controlled to meet its design requirements as indicated in 6.2.4.3 Interior Design Conditions. The HVAC system shall maintain any user selected temperature set point (within the indicated band) to a precision of +/-2 degrees F. The system shall maintain the required humidity set point to a precision of +/-5% relative humidity.

The minimum acceptable outdoor air requirements for ventilation shall be in accordance with ASHRAE 62.

In accordance with DA PAM 385-64 paragraph 8-25, due to the presence of explosives dust, the air in the Processing and Machining Areas (except Shop Room 218 and the Control Rooms) shall not be recirculated. Exhaust fans in the Processing and Machining areas shall be designed in accordance with DA PAM 385-64 paragraph 8-25.

In accordance with DA-PAM 385-64 paragraph 8-25, all Processing and Machining Areas shall be maintained under a slight negative pressure.

Heating, Ventilation and Air Conditioning (HVAC) systems shall be sized to provide comfort ventilation through the use of an economizer cycle to achieve design conditions. The HVAC systems, when the winter dry bulb temperature is 35 degrees F. or less, shall be designed so that up to 100% outside air may be used to provide all the cooling needed, or reduce the load on the air conditioning

refrigeration equipment. Use of the economy cycle above 35 degrees F. shall be provided when use of the economy cycle is cost effective.

All HVAC system equipment installed in energetic areas (all spaces in the Processing and Machining areas) shall have non-sparking components and shall be explosion proof. The entire HVAC system shall be electrically continuous (e.g. ducts, piping, insulation jackets, hangars, equipment, terminals, grilles, etc.)

Piping and ductwork in the Administration Area shall be concealed. Piping and ductwork in the Machining and Processing Areas may be exposed.

6.2.2 Energy Use

This project shall comply with UFC 3-400-01 Design: Energy Conservation. This includes (but is not limited to) compliance with ASHRAE 90.1 and preparing a building energy calculation.

The energy calculation shall be performed using Blast, Carrier HAP, Trane Trace 700 Load Design Program, latest versions, computer program or an equivalent approved by the Government that performs an hourly simulation of building performance. Design submissions of the building energy analysis shall include complete input data and the following output data (as a minimum): a) Systems summary; b) Monthly energy consumption; c) Equipment energy consumption; d) Energy use summary; e) Building monthly cool-heat demand profiles.

6.2.3 Load Calculations

Heat gain and loss calculations shall be, as a minimum, in accordance with the ASHRAE Fundamentals Handbook and the ASHRAE Cooling and Heating Load Calculation Manual. The load calculations shall be in accordance with ASHRAE non-residential Cooling and Heating Load Calculations and be made using the same program as for the energy calculations. Calculations shall be performed on a room-by-room basis. The cooling equipment shall be selected based on satisfying both the total and latent calculated loads. Heating load calculations shall not consider lights or internal loads as supplementing the heating system.

Complete input and output summaries for the load calculations shall be submitted during the design process. Heating and cooling loads shall be calculated using the ASHRAE load calculations and shall include the design parameters listed in paragraph Design Conditions. For bidding purposes, the Contractor shall use the British Thermal Unit per Hour (BTUH) equivalent of equipment electrical power requirements, in the heat gain and loss calculations.

6.2.4 Design Conditions

6.2.4.1 Site Criteria

Temperature conditions at ARDEC range from 89 degrees F in July to minus 6.0 degrees F in January. Summer relative humidity is approximately 53%.

Project Location: ARDEC Latitude: 40° 56' N
Longitude: 074° 34' W Elevation: 706 feet

Prevailing Wind: WestNorthWest at speed of 11 knots.

6.2.4.2 Outside Design Conditions

Outside design conditions (per UFC 3-400-02):

Heating: 6°F Dry Bulb (97.5% Condition)
Cooling: 89°F Dry Bulb, 75°F Wet Bulb (2.5% Condition)
Air Cooled Condenser Ambient Temperature: 95°F

Degree Days (65°F Base)
Cooling: 430
Heating: 6304

6.2.4.3 Interior Design Conditions

	Winter	Summer	Ventilation	Misc
MACHINING				
Machining Rooms (301, 302)	50°-68°F adjustable (adj.) 55% Relative Humidity (RH)	75°F, 55% RH	0.5 CFM/sq. ft. *Note e, f*	
PROCESSING				
Washing & Drying (200)	50°-68°F (adj.) 55% RH	75°F, 55% RH	ASHRAE 62 Note f	*Note g*
Mechanical Room (201)	50°F (minimum)	No A/C required	*Note a*	
Fire Sprinkler (202)	50°F (minimum)	No A/C required	*Note a*	
Electrical (203)	50°F (minimum)	No A/C required	*Note a*	
Communications (204)	Not to exceed 68°F	75°F	Per ASHRAE 62	
Melt/Pour (206)	50°-110°F (adj.) 55% RH	75°F-110°F (adj.) 55% RH	ASHRAE 62, *Note d, f*	
Drying Oven (207)	50°-68°F (adj.) 55% RH	75°F, 55% RH	ASHRAE 62 Note f	*Note c*
Holsten Stills (208)	50°-68°F (adj.) 55% RH	75°F, 55% RH	ASHRAE 62, Room to contain two fume hoods which exhaust 2345 cfm each. Note f	
Curing Oven (209)	50°-68°F (adj.) 55% RH	75°F, 55% RH	ASHRAE 62 Note f	*Note c*
Conditioning Oven (219)	50°-68°F (adj.) 55% RH	75°F, 55% RH	ASHRAE 62 Note d,f	
Utility Room(215A,	50°F (minimum)	No A/C required	Note a	

219A)				
Contaminated Waste Water Tank(222)	50°-68°F (adj.) 55% RH	75°F, 55% RH	*Note b*	
All other Processing Rooms	50°-68°F (adj.) 55% RH	75°F, 55% RH	ASHRAE 62 Note f	
ADMINISTRATIVE				
Office/Cubicle Areas (101)	50°-68°F (adj.) 55% RH	75°F, 55% RH	20 CFM/Person or 0.5 cfm/square ft., whichever is greater	
Breakroom/ Conference Room (102, 103)	50°-68°F (adj.) 55% RH	75°F, 55% RH	20 CFM/Person or 0.5 cfm/square ft., whichever is greater	
Mens/Womens Rooms (104, 105)	50°-68°F (adj.)	75°F	2 CFM/sq. ft. or 50 CFM per WC or urinal whichever is greater.	
Janitors Closet (106)	No heat required (if interior space)	No A/C Required	10 air changes per hour, activated by light switch.	
Electrical Rooms (107)	50°F (minimum)	No A/C required	*Note a*	
Communications Rooms (108)	Not to exceed 68°F	75°F	Per ASHRAE 62	
MAGAZINE				
Storage (400-403)	No heat required	No A/C required	Passive ventilation only. No cross contamination between magazines	
OTHER				
All Other Rooms (including Cooridors)	50°-68°F (adj.) 55% RH	75°F, 55% RH	Per ASHRAE 62	

Notes

a. Provide summer comfort ventilation to remove space heat gains based on a 10°F temperature rise or 6 air changes per hour whichever is greater. Winter ventilation shall be a minimum of 20 CFM/person, or 0.5 cfm per square foot, whichever is greater.

b. Room containing the Contaminated Water Collection tank shall be ventilated to meet requirements of NFPA 820.

c. Each drying oven adds 1000 watts heat gain to the room.

d. Room shall be provided with independent manually activated and deactivated high volume exhaust (~10 air changes per hour) with tempered makeup air designed to not allow the room temperature to drop lower than 55 degrees F during exhaust.

e. Each machining room shall be provided with a manually activated high volume exhaust (~10 air changes per hour) with tempered makeup air designed to not allow the interior temperature to drop lower than 55 degrees F during exhaust. System shall remain in operation for 30 minutes (shall be user adjustable from 15-120 minutes) or until the user manually deactivates the system.

f. In accordance with DA PAM 385-64 paragraph 8-25, due to the presence of explosives dust, the air in the Processing and Machining Areas (except Shop Room 218 and the Control Rooms) shall not be recirculated. Exhaust fans in these areas shall be designed in accordance with DA PAM 385-64 paragraph 8-25.

g. Exhaust vent shall be provided for the dryer(s).

6.2.5 Equipment, Personnel, and Lighting Loads.

Heat gains for equipment people and lighting as a minimum shall be as follows:

a. Lighting (all areas): Include heat load based on electrical lighting level requirements.
b. Personnel
   1. Individual offices: 1 person per office at 256 btu/hr sensible heat, 188 btu/hr latent heat
   2. Administration areas: 150 square feet/person at 256 btu/hr sensible heat, 188 btu/hr latent heat
   3. Breakrooms: 21.5 square feet/person at 256 btu/hr sensible heat, 188 btu/hr latent heat
   4. Machining Areas, Processing Areas: 970 square feet/person at 427 btu/hr sensible heat, 675 btu/hr latent heat (50% heavy work, 50% light bench work)
c. Equipment (anticipated - Contractor shall verify and design as required to satisfy equipment load requirements):
   1. Office/Administration areas: 1 computer per person at 460 btu/hr per computer, 1 printer per 2 persons at 1875 btu/hr per printer, 1 copier at 3750 btu/hr.
   2. Breakrooms: One coffee pot at 5120 btu/hr total, 3585 btu/hr sensible, one microwave at 3415 btu/hr, one 21 cubic foot refrigerator at 1470 btu/hr, one snack vending machine at 940 btu/hr, one cold vending machine at 3275 btu/hr.
   3. Machining areas, processing areas, mechanical rooms, electrical rooms, communication rooms: Equipment heat gains shall be based on heat gains from equipment indicated plus all equipment/piping provided by the Contractor to meet design requirements. The HVAC systems shall be designed to meet the required design conditions, regardless of which equipment may or may not be operating at any given time.

6.2.6 Seismic Design Requirements

Seismic restraint measures shall be provided in accordance with UFGS 15070A SEISMIC PROTECTION FOR MECHANICAL EQUIPMENT, UFGS 13080 SEISMIC PROTECTION FOR MISCELLANEOUS EQUIPMENT, SMACNA Seismic Restraint Manual; Guidelines for Mechanical Systems, TI 809-04, Seismic Design for Buildings and TI 809-05 Seismic Evaluation and

Rehabilitation for Buildings. The seismic classification shall be as indicated in Part 5, Structural Design.

6.2.7 Sound and Vibration Isolation

Sound and Vibration Control shall be provided for all HVAC systems and equipment per the ASHRAE HVAC Applications Handbook (2003), Chapter 47, and UFC 3-450-01. All components of the vibration isolation system shall be electrically continuous.

6.2.8 Radon Mitigation

ARDEC is a site where Radon Gas has been detected. Radon mitigation measures shall be designed and constructed in accordance with UFC 3-490-04A. The Contractor shall assume that the Radon Action Level is “Very High” (per UFC 3-490-04A) and that active mitigation measures are required.

The Contractor shall design and construct a complete active mitigation system in accordance with UFC 3-490-04A except that the exhaust fan shall not be immediately installed.

Once the HVAC system is fully operating, the Contractor shall conduct a radon test (using protocol approved by the CO). A copy of the results shall be provided to the CO and the ARDEC Department of Public Works. If the tested radon level is “Low” or higher (as defined in UFC 3-490-04A), an exhaust fan shall be installed.

Measures for sealing the building structures, to prevent migration of radon gas into the buildings, shall be incorporated into the building designs.

6.2.9 District Heating

The heating source for all building heating and process heating requirements shall be district steam. The Contractor shall install a new steam supply line from the existing 6 inch, 100psi steam line (located along 5th Avenue) to the ERDLF. Within the building, the steam pressure shall be reduced to 15psi.

The steam line from the exterior main to the ERDLF shall be designed and constructed in accordance with UFC 3-430-09N, ASME B31.1 and UFGS 02554A for an Operating Pressure of 100 psi and a Maximum Allowable Working Pressure of 125 psi.

The required ASME B31.1 thermal/flexibility analysis for the new line shall include all the new piping and extend to the first anchor point(s) on the existing district steam line. Thermal expansion shall be accommodated through the use of bends and expansion legs. Mechanical expansion joints shall be avoided.

The existing steam line shall be isolated and vented by the steam system operators (Chevron Inc.) at the request of the Contractor. Twenty-one (21) days notice will be required for isolation of the existing steam line. The Contractor shall be responsible for making the connection to the existing steam line including preparation of the existing main (i.e. cutting pipe, removing and replacing insulation and

insulation jacket). The new steam line shall be ASTM A53 Type E or S (Grade A or B) schedule 40. Insulation on the exterior line shall be in accordance with UFGS 02554A with a vapor barrier and aluminum jacketing. A shutoff valve shall be installed at the connection point to the existing main in accordance with UFGS 02554A. All new welds upstream of the new isolation valve shall be 100% radiographed in accordance with ASME Section V Nondestructive Examination. Steam piping downstream of the new valve shall be pressure tested in accordance with ASME B31.1 and 10% of the welds shall be radiographed in accordance with ASME Section V.

Two pressure reducing stations shall be installed inside the building. One shall be provided for HVAC use (15psi) and the other shall be provided for process use (see Process System requirements).

Steam condensate is not returned to the steam plant. Within the ERDLF, all condensate shall return to a mechanical room and then discharge to grade.

6.2.10 Air Handling Units

Air handling units shall meet the requirements of UFGS 15895 except as modified in this document. Air handling units shall be factory packaged, section modular type design, constructed of 50 mm thick pre-insulated double wall panels. A minimum 400 mm access section with door shall be provided upstream of each coil. Maximum coil face velocities shall be limited to 475 feet per minute (2.4 meters per second). Control dampers shall be constructed to provide no more than 10 CFM/ft2 (50.8 lps/m2) air leakage at 4" (1 kPa) water column. Angled filter section shall not be utilized. Air handling units shall be factory assembled mounted on a common structural base channel system. Supply fan section shall be mounted on a steel base frame and shall be isolated from air handling unit base rails by the use of housed spring isolators. Fans shall be V-belt driven by belt drives sized for 150% of design power requirement. Provide adjustable sheaves for fans up to 20 Hp (15 kW).

6.2.11 Building Heating

Heating distribution to the air handling units/terminal units shall be a closed loop hot water system. The 15psi steam system may heat the hot water heating system utilizing a shell and tube heat exchanger. The control of the steam side shall include dual control valves (1/3, 2/3 valves) or a system of equal turndown ratio.

Heating system piping shall be designed and constructed in accordance with ASME B31.1 and UFGS 15569A, including provisions for expansion, supports, and seismic restraints. Piping shall be steel or copper in accordance with UFGS 15569A, however only threaded, welded or brazed joints are permitted. All shutoff valves shall be full port. Gauges shall be liquid filled, non-shock type. Insulation shall be in accordance with UFGS 15080A including PVC jacketing in the Administration Area and aluminum jacketing in the Processing and Machining Areas.

The heating water shall be treated to reduce corrosion and scaling. In addition, a chemical shot feeder shall be included for future treatment.

An automatic makeup water system shall be included. The water supply shall be from the filtered and softened domestic water.

Heating system pumps shall be duplex variable speed in a lead/lag configuration with automatic rotation (based on runtime and pump failure). All pumps shall be mounted on anchored reinforced concrete housekeeping pads located within the mechanical room. Manufacturer's recommended service clearance shall be provided. Pumps shall be provided with calibrated balancing valves, check valves, pressure gauges (inlet and outlet), strainer, and diaphragm expansion tank and a centrifugal air separator with automatic fill valve and air vent.

Heating piping to air handling unit coils shall be provided with isolation valves, automatic two-way control valves, calibrated balancing valves, strainers, and temperature and pressure test plugs.

The heating water supply temperature set point shall be automatically reset utilizing the DDC system, linearly, from 200°F down to 140°F, upon a rise in outdoor air ambient temperature from minus 7°F to plus 60°F, as sensed by an outdoor air temperature sensor.

All other heating system equipment and accessories shall be provided as specified under UFGS 15569A.

6.2.12 Air Conditioning

Air conditioning systems shall be provided in accordance with UFC 3-410-01FA, UFGS 15895, and UFGS 15620A. Air distribution systems shall be provided in accordance with the requirements of UFGS 15895.

Refrigerants used shall have Ozone Depletion Potential less than 0.05 AND shall not be planned for phase out in the United States. R-134A, R407C, and R-410A meet these requirements. The total volume of refrigerant of the air conditioning systems shall be within the specified limits of ASHRAE Standard 15. Refrigeration leak detection systems and dedicated refrigerant leak venting systems shall be provided as required and in accordance with the above sections and ASHRAE 15.

Condenser/compressor units shall be factory assembled and prewired packaged units, of the same manufacturer as the air handling evaporator unit sections with which they are connected. Evaporator coils shall be selected to be load and suction temperature matched with their associated condenser coil and compressors as balanced and matched sets. Condenser/compressor units shall be equipped with refrigerant piping, controls, motor starters, contactors, wiring, control transformer, hermetic compressors, condenser coils, condenser fans, motors, vibration isolation, galvanized steel casing and refrigerant isolation valves. Units shall be factory provided with a full charge of refrigerant. Condenser/compressor unit integral controls shall include, but not be limited to, high head pressure cutout switch, low suction pressure cutout switch, anti-recycle timer, and low oil

pressure cut-out switch. The condenser/compressor unit shall be provided with a single electrical power source connection.

6.2.13 Ventilation

Ventilation shall be provided in accordance with UFC 3-410-01FA, ASHRAE 62 and as modified by this document.

Each air-handling unit shall be provided with a carbon dioxide gas detection and control system for override control of outdoor air. Upon a rise in space carbon dioxide gas concentration to an adjustable set point of 800 parts-per-million, as sensed by a return/exhaust duct mounted carbon dioxide gas sensor, the associated air handling system's outdoor air intake and exhaust air dampers shall modulate as required to maintain the carbon dioxide set point. Upon a reduction in space carbon dioxide gas concentration below set point, the dampers shall modulate towards reduced outdoor air position.

6.2.14 Humidification

HVAC Humidification shall be provided through a factory assembled steam injection humidifier, designed in accordance with ASHRAE HVAC Systems and Equipment Handbook and the recommendations of ASHRAE Guideline 12 to minimize the risk of Legionella Disease. The system shall also meet the requirements of UFGS 15720N. Steam shall be clean and sterile for injection into the air stream.

The Contractor may utilize district steam or electricity as the heat source for producing clean steam. (The district steam shall NOT be injected into the air stream.) A water treatment system shall be provided in accordance with the humidifier manufacturers recommendation. The softened and filtered domestic water may be utilized if it meets the humidifier manufacturers recommendations. The humidification system shall be fully automatic.

6.2.15 Hydronic, Refrigerant Piping Locations

Riser piping located in interior partition or exterior walls is prohibited. Refrigerant pipe risers shall be installed within two-hour rated chases.

6.2.16 Water Quality

The domestic water at ARDEC is assumed to have the following average properties:

Hardness:	675 Feed Conductivity (microsiemens) 24 grains per gallon total dissolved solids
Turbidity:	0.044 NTU
Iron:	0.02 PPM
Manganese:	0.03 PPM
PH:	7.79
Chlorine Residual:	0.46 PPM

The Contractor shall perform a water quality test to confirm the above data and obtain any data necessary for the proper sizing and selection of the Reverse Osmosis water softener.

6.2.17 Water Filtration and Softening

All incoming water to the building (except fire sprinkler water and domestic cold water) shall be filtered and softened by a common automatic system. Domestic cold water shall be filtered but not softened.

Filtration and softening requirements shall be based on the requirements of the HVAC steam humidification system and process water systems. Sizing of the system shall account for all HVAC, plumbing and process usages.

The water softening system shall be Reverse Osmosis (RO) type and shall be carefully sized and selected to not produce water that is aggressive toward equipment, piping or components. The softened water shall meet the requirements of ASTM D1193, Type IV water. Water quality shall be constantly monitored.

6.2.18 Water Treatment

A chemical shot feeder shall be provided for the manual introduction of corrosion inhibitors into the closed loop heating system.

6.2.19 Miscellaneous Equipment Exhaust Systems

Exhaust vents shall not be located near outdoor air intakes to prevent short circuiting of exhaust air, nor shall they be located less than 10'-0" above grade. Provide air intake and exhaust opening separation in accordance with UFC 3-410-01FA.

System shall be as specified in UFGS 15895 AIR SUPPLY DISTRIBUTION, VENTILATION, AND EXHAUST SYSTEMS. Makeup air system shall be provided with 10% more capacity than exhaust system. Makeup air system shall temper outside air to the space design heating temperature as a minimum. Tempering of makeup air shall be accomplished through the use of run-around heat recovery coils and heating coils or heat recovery equipment with heat wheels. Heat recovery shall be the first stage of heating.

6.2.20 Equipment

All materials and equipment shall be the standard cataloged product of manufacturers regularly engaged in production of such materials and equipment, and shall be the manufacturer's latest standard design. Equipment shall comply with the requirements of Underwriters Laboratories, Inc. (UL), American Gas Association (AGA), Air Conditioning and Refrigeration Institute (ARI), American Society for Testing and Materials (ASTM), National Electric Manufacturers Association (NEMA), American National Standards Institute (ANSI), National Fire Protection Association (NFPA) and/or other national trade associations as applicable.

Equipment selection, layout, and installation shall comply with the manufacturer's recommended clearances and required code clearances. Rooftop equipment shall not be used in this Facility.

All floor-mounted equipment shall be placed on 4" (minimum) thick concrete housekeeping pads.

6.2.21 Duct Terminal Units

The air terminal units shall be as specified in UFGS 15895. Insulation shall be provided per UFGS 15080A.

6.2.22 Louvers

All outside air inlets and exhausts shall be equipped with louvers, bird and insect screens and dampers, as required, and in accordance with code requirements. Louvers shall be storm proof and AMCA labeled with a maximum moisture penetration of 0.01 oz of water per square foot. Where air inlets and exhausts must be interlocked with other equipment or systems, dampers shall be motorized.

The Contractor shall provide controls and start-up sequences, which ensure that when such equipment or systems are activated, interlocked motorized dampers and fans are fully open and operating. If, for any reason, the interlocked motorized dampers and/or fans do not fully open or operate as intended, when such equipment or systems are activated, the start-up sequence shall make provision for immediate shut-down of the equipment or system, and alert the operator.

6.2.23 Access Panels

Access panels/doors shall be provided as required for valves and appurtenances of the HVAC system in accordance with UFGS 15895. Coordinate with the Architectural discipline UFGS 05500A MISCELLANEOUS METAL with respect to access panels/doors. All panel locations and sizes shall be indicated on the Design/Build Contract Design Drawings.

6.2.24 Duct System Design

The ductwork shall be sized using the design methods specified in UFC 3-410-01FA. Duct locations shall be coordinated with all disciplines. All ductwork shall be galvanized sheet metal and as specified in UFGS 15895. Flexible duct run outs shall be insulated metallic and shall be limited to 5 ft. spans. Electrical continuity shall be maintained throughout so as to prevent static charge accumulation and potential for explosive discharge.

Sound and vibration control shall be per the 2003 ASHRAE HVAC Applications Handbook, Chapter 47, entitled "Sound and Vibration Control". The ductwork shall be insulated in accordance with UFGS 15080A THERMAL INSULATION FOR MECHANICAL SYSTEMS. Ductwork, ductwork openings, and plenums shall be designed to a maximum NC of 35. Duct and air distribution devices shall meet the velocity requirement indicated in the 2003 ASHRAE Handbook.

6.2.25 Volume Dampers

Volume dampers shall be provided on all supply ducts to diffusers, outside air, return, and exhaust ducts to ensure proper balancing and mixing within the system. Dampers integral with

registers or diffusers shall not be considered volume dampers for the purpose of balancing. Manual balancing dampers shall be furnished with accessible operating mechanisms. Where operators occur in finished portions of the building, operators shall be chromium plated. Unless otherwise indicated, multi-leaf dampers shall be opposed blade type with maximum blade width of 12". Access doors or panels shall be provided for all concealed damper operators.

6.2.26 Filters

Filters provided for air handling equipment shall be in accordance with UFC 3-410-01FA and UL 900 Class 2 certified.

6.2.27 Fire Dampers

Fire dampers shall be fire rated according to the areas being protected. Fire dampers shall conform to the requirements of NFPA 90A, UL 555, and IBC. Fire dampers shall be installed in accordance with NFPA 90A. Fire dampers shall be automatic operating type and shall have a dynamic rating suitable for the maximum air velocity and pressure differential to which it will be subjected. Fire dampers shall be approved for the specific application, and shall be installed according to their listing. Fire dampers shall be as specified in UFGS 15895. Fire dampers shall be type "B", with curtain blades outside of the air stream in the unreleased retracted position.

6.2.28 Diffusers, Grilles and Registers

Air distribution devices shall be factory-fabricated of corrosion-resistant steel, or aluminum and shall distribute the specified quantity of air evenly without causing noticeable drafts, air movement faster than 50 fpm in occupied zone, or dead spots anywhere in the conditioned area. Inlets and outlets shall be sound rated and certified according to ASHRAE 70. Diffusers and registers shall be as specified in UFGS 15895 and shall be color coordinated with the Architectural design.

6.2.29 Insulation

All piping, ductwork, air handlers, pumps, and other applicable equipment shall be insulated in accordance with UFGS 15080A. Insulated pipe shall be provided with PVC jackets in the Administration Area and aluminum jackets in the Processing and Machining areas.

6.2.30 Control System

The HVAC control system shall be designed and constructed in accordance with UFC 3-410-02A, TI-811-12, UFGS 15951A and this document. The contractor shall be responsible for correct operation of the control system including, but not limited to, software, control relays, sensors, and control wiring. A 16-hour training course shall be provided in accordance with UFGS 15951A. All thermostats located in the Process or Machining Areas shall be spark-proof and explosion-proof.

Each air handling system shall have direct digital type automatic temperature controls to facilitate operation in the "occupied",

"unoccupied-night setback", "morning warm-up" and "outdoor air economizer" modes of operation.

a. Temperature and Humidity Controls: Temperature and humidity controls shall be direct digital control in accordance with the above listed standards.

b. Direct Digital Controls: Control drawings shall include schematics, ladder diagrams and sequence of operation for all HVAC equipment. The DDC system shall include all application software and equipment to implement the control strategies that are contained in UFGS 15951A. The program nomenclature shall follow the Base standard. Application software shall be provided for each system as recorded on the Energy Monitoring and Control System (EMCS) points list. The Contractor shall insure that DDC system completely interfaces with the existing EMCS (Trane Tracer Summit) installed at ARDEC. The system shall be capable of monitoring and override from the central EMCS computer, and shall be designed to provide complete stand-alone operational control in the event of communications failure.

c. Energy Monitoring and Control System (EMCS): The building DDC system shall be connected to the existing Trane Tracer Summit base-wide EMCS through a phone modem 56.6 Kbps. The EMCS shall be modified in coordination with the COR and Base Engineer's office. The contractor shall fully program the HVAC/EMCS control panel, including graphics and control schemes in the EMCS central computer. The graphics screens shall include a building floor plan indicating control locations and detail screens of individual equipment controls as required in the points list. The control schemes and graphics shall be approved by submittal. The building DDC system shall accept override controls, set-point adjustments, and program central network monitoring and control functions. All alarms generated by the building DDC shall automatically be logged with the EMCS central computer. A text-based sequence of operation screen shall be linked to the graphics screens for the building and shall explain control procedures. TI 811-12 shall provide guidance for the Data Transmission Media (DTM) considerations and provide guidance for the I/O summary. The Base Project Manager (coordinated through the CO) shall be consulted on the actual points list. The installation shall be fully compatible with the existing EMCS system, and shall be subject to approval by Contracting Officer prior to incorporation into the design.

d. Metering: The Contractor shall provide water and electric meters with pulse initiators per Base standards and UFC 3-400-01, for energy consumption and utility metering and automated reporting through the remote central EMCS.

6.2.31 Utilities

Meters for water and electricity shall be provided and installed in accordance with UFC 3-400-01 paragraph 2-6, which includes remote readout through the central EMCS.

6.2.32 Identification and Labeling

Identification and labeling shall be in accordance with UFGS 15895, ANSI A13.1 and the following.

Piping and ductwork shall be provided with permanent identification labels and flow arrows. Labels shall be installed at each change of direction, point of entry and in congested areas but shall not be spaced more than 25ft apart.

Valves and components shall be provided with identification tags. Tags shall be made of brass or engraved laminated plastic, indicating the service and item number. Tags shall be 35 mm (1-3/8 inch) minimum diameter and marking shall be stamped or engraved. Indentations shall be black for reading clarity. Tags shall be attached with No. 12 AWG, copper wire, chrome-plated beaded chain or plastic straps designed for that purpose.

6.2.33 Testing, Adjusting, and Balancing

Testing, adjusting, and balancing shall be performed in accordance with UFGS 15990A

6.2.34 Commissioning of HVAC Systems

The Mechanical system commissioning shall be in accordance with UFGS 15995A Commissioning of HVAC System except as modified in this RFP. Commissioning requirements shall be clearly detailed on the design drawings and shall be clearly stated in the construction specifications to ensure the HVAC systems are properly installed, balanced and calibrated prior to building occupancy. Detailed reports shall be submitted documenting the procedures and outcome of the commissioning tests. Integrated systems testing such as Emergency Power/HVAC, Fire Alarm and Control/Emergency Power/HVAC shall be included in the commissioning scope.

6.3 PLUMBING

6.3.1 General Design Criteria

The water and sanitary system design shall be in accordance with the International Plumbing Code (IPC), UFC 3-420-01FA and UFGS 15400A.

All plumbing equipment installed in energetic areas (all spaces in the Processing and Machining areas) shall have non-sparking components and shall be explosion proof. The entire plumbing system shall be electrically continuous (e.g. piping, valves, insulation jackets, hangars, equipment, etc.)

Piping and ductwork in the Administration Area shall be concealed. Piping and ductwork in the Machining and Processing Areas may be exposed.

6.3.2 Equipment and Materials.

All materials and equipment shall be the standard cataloged product of manufacturers regularly engaged in production of such materials and equipment, and shall be the manufacturer's latest standard design. Equipment shall comply with the requirements of American Society for Testing and Materials (ASTM), National Electric Manufacturers Association (NEMA), American National Standards Institute (ANSI) and/or other national trade associations as applicable.

Equipment selection, layout, and installation shall comply with the manufacturer's recommended clearances and required code clearances. Rooftop equipment shall not be used in this Facility.

6.3.3 Access Panels

Access panels/doors shall be provided as required for valves and appurtenances of the plumbing system in accordance with UFGS 15400A PLUMBING, GENERAL PURPOSE and UFGS 05500A MISCELLANEUS METAL. All panel locations and sizes shall be indicated on the Design/Build Contract Design Drawings.

6.3.4 Fixture Allowance

The building shall have rest rooms and other plumbing fixtures as required and as indicated on the Architectural Floor Plans, Room by Room Requirements, and as provided in UFGS 15400A.

Emergency combination eyewash/showers shall be in accordance with ANSI Z358.1 and installed where indicated in Attachment A.

6.3.5 Valves

Plumbing fixture valves shall be provided in accordance with the International Plumbing Code and UFGS 15400A.

6.3.6 Domestic Water Supply

Operating pressure for the domestic water system is approximately 50 psi. The Contractor shall test and verify the operating pressure in

the area of the new building prior to performing final water system calculations.

Design pressure shall be 150 psi.

The domestic water quality at ARDEC is as indicated in Paragraph 6.2.16 Water Quality.

Per the civil requirements, a separate potable domestic water supply and sprinkler water supply shall be installed.

The main potable water supply line shall be protected by means of a reduced-pressure backflow preventer. The main sprinkler water supply line shall be protected by means of a double-check type backflow preventer. Backflow prevention devices shall also be provided on all water subsystems that could potentially backflow and contaminate the building water system (i.e. water softener).

A water meter shall be provided and installed in the mechanical room in accordance with UFC 3-400-01.

The mechanical piping shall be extended to fixtures, outlets, and equipment. The domestic hot-water and cold-water piping system shall be arranged and installed to permit draining. The supply line to each item of equipment or fixture, except faucets, flush valves, or other control valves, which are supplied with integral stops, shall be equipped with a shutoff valve to enable isolation of the item for repair and maintenance without interfering with operation of other equipment or fixtures. Supply piping to fixtures, faucets, hydrants, showerheads, and flushing devices shall be anchored to prevent movement.

Electrical continuity shall be maintained throughout the plumbing and associated piping systems so as to prevent static charge accumulation and the potential for explosive discharges.

Velocities in domestic hot and cold water piping shall be designed for a maximum of 4 ft/s.

6.3.7 Domestic Hot Water

Domestic hot water system shall be sized in accordance with the International Plumbing Code and incorporate the recommendations of ASHRAE Guideline 12 to minimize the risk of Legionella.

In accordance with Paragraph 6.2.17 Water Filtration and Softening, the water supply for the domestic hot water shall be filtered and softened.

Domestic hot water shall be produced with a district steam to hot water heat exchanger and storage tank certified for domestic use. The heat exchanger shall be ASME code stamped. The storage and operating temperature shall be 140°F. The building water supply temperature shall be 120°F. A recirculation line shall be included. The size of the hot water heater shall be in accordance with the 2003 ASHRAE Applications Handbook. Hot water heaters shall be provided as required to economically and cost effectively service all areas throughout the

project and shall be located in a Mechanical Room. Water heaters shall be provided with fully automatic controls with safety shut-off relief valves.

For small hot water usage requirements, such as an isolated hand wash lavatory, electric instantaneous hot water heating units may be proposed by the Contractor for consideration, and accepted by the Contracting Officer on a case by case basis, for those areas where this type of device would not constitute a compromise to the explosion-proof designation of the space. The water heater shall meet ASHRAE 90.1.

6.3.8 Sanitary Waste and Vent

The building sanitary waste and vent systems shall be designed in accordance with the International Plumbing Code. All lavatory and sink drains and P-traps shall be coordinated with architectural millwork to isolate drains. Coordinate location of floor drains with the structural discipline for floor sloping requirements. All floor drains shall be equipped with trap seal primers. Floor drains shall be as specified in UFGS 15400A.

Laundry room drains, washing machine drains, and all drains from the Processing and Machining areas shall drains as indicated to the contaminated waste collection system. See paragraph 6.4.7 Contaminated Wastewater Collection System.

6.3.9 Seismic Design

Seismic restraint measures shall be provided in accordance with UFGS 15070A SEISMIC PROTECTION FOR MECHANICAL EQUIPMENT, UFGS 13080 SEISMIC PROTECTION FOR MISCELLANEOUS EQUIPMENT, SMACNA Seismic Restraint Manual; Guidelines for Mechanical Systems, TI 809-04, Seismic Design for Buildings and TI 809-05 Seismic Evaluation and Rehabilitation for Buildings. The seismic classification shall be as indicated in Part 5, Structural Design.

6.3.10 Fire Protection Supply Line

The underground fire protection supply line shall be ductile iron per the civil requirements.

6.3.11 Supply, Drain, Waste, and Vent Piping Systems

Piping system for water and sewer outside of the five foot line of the building are to be as specified under the civil portion of the design criteria. Runs are to be kept as short as possible. Metallic vent piping shall be used through the roof from at least 6" below the roof to the required point of termination above the roof. All vent and roof drain piping located in ceiling spaces which are used as return air plenums shall be insulated in accordance with specification UFGS 15080A - THERMAL INSULATION FOR MECHANICAL SYSTEMS. Supply, waste, and vent piping materials shall be as specified in UFGS 15400A.

6.3.12 Vibration/Noise Isolation

Water hammer arrestors shall be used to minimize water system noise in accordance with PDI-WH 201. Velocities in domestic water piping shall be designed for a maximum of 4 ft/s.

6.3.13 Condensate Waste

Condensate waste from air conditioning systems shall be disposed of in an environmentally acceptable manner, and in accordance with the International Plumbing Code, and as directed by the Contracting Officer.

6.3.14 Identification and Labeling

Identification and labeling shall be in accordance with UFGS 15400A, ANSI 13.1 and the following.

Piping shall be provided with permanent identification labels and flow arrows. Labels shall be installed at each change of direction, point of entry and in congested areas but shall not be spaced more than 25ft apart.

Valves and components (except at supply fixtures) shall be provided with identification tags. Tags shall be made of brass or engraved laminated plastic, indicating the service and item number. Tags shall be 35 mm (1-3/8 inch) minimum diameter and marking shall be stamped or engraved. Indentations shall be black for reading clarity. Tags shall be attached with No. 12 AWG, copper wire, chrome-plated beaded chain or plastic straps designed for that purpose.

6.4 PROCESS SYSTEMS

6.4.1 General Design Criteria

Process systems (water, steam, vacuum, contaminated wastewater and compressed air) shall be provided as required in Attachment A and this document.

Process systems in the energetic areas (all spaces in the Processing and Machining Areas) shall have non-sparking components and shall be explosion proof. All process systems shall be electrically continuous (e.g. piping, valves, tanks, drains, insulation jackets, hangars, equipment, etc.).

6.4.2 Water Filtration and Softening

In accordance with Paragraph 6.2.17 Water Filtration and Softening all incoming water to the facility (except fire and domestic cold water) shall be filtered and softened.

6.4.3 Process Water

Process water shall be provided to process water taps and steam cleaning stations where indicated in Attachment A. Process water shall be the filtered and softened (Reverse-osmosis) domestic water indicated in Paragraph 6.2.17 Water Filtration and Softening.

Each supply location shall be designed for a peak flow rate of 10 gpm at 20psi (minimum).

The process water system shall be designed for a maximum 15gpm simultaneous demand and a total of 300 gallons per day.

Process water taps shall be mounted nominally 3'-0" above finished floor or as directed by Contracting Officer.

6.4.4 Process Steam

Process steam shall be 15psi and provided to the Processing Area heat exchangers, steam cleaning stations, and process steam supply taps as indicated in Attachment A. The system shall be designed and constructed in accordance with ASME B31.1. The design Operating Pressure shall be 15psi. The Maximum Allowable Working Pressure (MAWP) shall be 30psi.

The 15psi process steam shall be supplied from the district steam system via a pressure reducing station. The pressure reducing station shall be separate from the reducing station used for HVAC purposes. The reducing station shall be automatic with manual set-point adjustment (adjustable from 10-30psi) including upstream and downstream pressure gages.

Condensate from the Processing Room heat exchangers shall be returned to the mechanical room and then discharged to grade.

The steam piping shall be black steel in accordance with ASTM A53 Type E or S (Grade A or B) schedule 40. The condensate piping shall be ASTM A53 Type E or S (Grade A or B) schedule 80.

No ball valves shall be used in the steam system. All gauges shall be non-shock liquid filled.

The process steam system shall be designed to meet ALL the following loads simultaneously without dropping the supply pressure or flow rate (at the supply points) by more than 5%.

Process Room Heat Exchangers: 40% of capacity in operation simultaneously

Steam Cleaning Stations: 2 stations in operation simultaneously

Process Steam Supply Taps: 25% of capacity in operation simultaneously

6.4.4.1 Steam Cleaning Stations

Each steam cleaning station shall consist of a process steam and process water supply with a manual mixing valve, adjustable steam regulator and waterside balancing valve. A flexible hose, hand-operated steam wand with variable flow trigger, wall mounted wand cradle, and wall mounted hose cradle. Each rooms hose shall be long enough to reach all areas of the room in which it is installed. Each station shall provide (at a minimum) the flow requirements indicated

below. However the minimum size of the steam supply line shall be 2 inches. Provisions shall be made to prevent the backflow of water into the steam system and steam into the water system.

Steam cleaning stations will be operated in Steam Cleaning Mode (steam and water mix) and Water Cleaning Mode (water only). Operational requirements are as follows:

Steam Cleaning Mode: 175lb/hr of 15psi steam mixed with 1.0gpm water at 20psi
One steam cleaning operation lasts 20 minutes
One operations per day / 20 days per month

Water Cleaning Mode: 10gpm of water at 20psi
One water cleaning operation lasts 5 minutes
One operation per day / 10 days per month

Steam cleaning stations taps shall be mounted nominally 3'-0" above finished floor or as directed by Contracting Officer.

6.4.4.2 Processing Room Heat Exchangers and Closed Loop Water Systems

Processing rooms shall have steam to hot water heat exchangers with closed loop heating water systems as indicated in Attachment A. Each heating water loop has a corresponding piece of Government installed equipment to be connected to.

The heat exchangers shall be shell-and-tube ASME code stamped steam to hot water sized in accordance with Attachment A. The heat exchanger shall be mounted to the wall approximately 8 foot above the finished floor. Adequate space shall be provided for pulling and cleaning the tubes. The primary side shall utilize 15psi steam. The secondary waterside shall be designed for 150 psi and sized based on the information in Attachment A, assuming a 40 degree secondary side temperature drop.

The Contractor shall install the heat exchanger and all primary side piping. The heat exchanger shall be mounted to the wall. The Contractor shall install the secondary side piping from the heat exchanger to a point on the wall near the future Government installed equipment approximately 4 feet above the finished floor. Two shut off valves shall be installed and the lines terminated for future government connection.

The secondary side heating water loop piping shall be ASTM B88 Type L copper. Two thermocouples shall be installed for control; one on the supply water and one on the return water side.

The steam supply shall be provided with dual equal-percentage automatic control valves (1/2, 2/3 control) with pneumatic actuators and spring-return. Control valves shall be globe style with minimum rangeability of 50:1. Valves shall fail closed.

6.4.4.3 Process Steam Supply Taps

Each supply tap shall be sized for minimum 280 lbs/hr and require a minimum nominal 2 inch supply line with a shut off valve,

adjustable automatic regulating valve (2-15 psi), and manual globe type control valve.

Steam taps shall be mounted nominally 3'-0" above finished floor or as directed by Contracting Officer.

6.4.5 Vacuum

Process vacuum shall be provided throughout the Facility with taps required where indicated in Attachment A. The system shall be designed and constructed in accordance with ASME B31.1 and provide medium level vacuum utilizing liquid ring vacuum pumps. The system shall be designed for 350 actual cubic feet per minute at 350 torr (or approximately 185 scfm). Each inlet connection shall be 2 inch and include a shutoff valve and an equal-percentage diaphragm type control valve rated for full vacuum.

The vacuum pump system shall not be a single pump, but a minimum of two pumps in parallel with automatic staging. The system shall be capable of maintaining a continuous no-flow condition.

All portions of the system, which may contact the vacuum air, shall be non-sparking and explosion proof. Local and central filtration shall be provided to filter out explosives dust and particulate. Provisions for accessing and cleaning all segments of the vacuum piping shall be provided.

Vacuum taps shall be mounted nominally 4'-0" above finished floor or as directed by Contracting Officer. All gauges shall be non-shock liquid filled.

6.4.6 Compressed Air Systems

6.4.6.1 Central Compressed Air System

An instrument quality compressed air system shall be provided throughout the facility with outlets required as indicated in Attachment A and provide service to the air driven hoists. The system shall be in accordance with UFC 3-420-02FA, UFGS 15211N and as indicated herein. The Contractor shall provide all equipment needed to refrigerate, dry, filter, and render the compressed air oil-free. The compressor shall be screw-type. The air dryer shall be capable of drying the air to a dew point of 36 degrees F.

The system design pressure shall be 125 psig. The operating pressure shall be 120 psig. Each compressed air outlet shall be designed for 75 scfm at 120 psig, however no line shall be smaller than 1 inch. Piping shall be schedule 40 black steel in accordance with ASTM A53 Type E or S (Grade A or B). The system shall be designed to provide full flow (75 scfm) to 4 outlets simultaneously while maintaining a minimum pressure of 100 psig.

Each tapping point shall have a ball-type shutoff valve. All gauges shall be non-shock liquid filled.

Compressed air outlet mounting height shall be nominally 4'-0" above finished floor or as directed by Contracting Officer.

6.4.6.2 Oven Compressed Air System

As indicated in Attachment A, five of the compressed air taps (supplying the Gruenberg and Tenney Ovens) are to be supplied from a separate dedicated compressed air system and compressor. The design requirements for the oven compressed air system are the same as for the central system except that the compressor (including filter and dryer) will be government furnished, government installed. The contractor shall install all other components of the system to interface with the compressor (i.e. piping, compressor pad, electrical supply, etc.)

The government furnished compressor has the following specifications: Ingersoll-Rand Model “SSR UP6-15-125 H”, 30 hp, 65 CFM @ 125 PSIG, 3-phase 460 volt. Also includes and air dryer requiring 120 volt, 20 amp circuit. The contractor is responsible to contact the compressor manufacturer to obtain any other installation requirements for the compressor.

Tapping points which require a supply pressure lower than 120 psig (as indicated in the Attachment A) shall be equipped with an adjustable automatic pressure regulators and gages. All tapping points shall have an individual ball-type shutoff valve. All gauges shall be non-shock liquid filled.

6.4.7 Contaminated Wastewater Collection System

A dedicated contaminated wastewater collection system shall be provided for the ERDLF. The system shall be used to collect explosives contaminated wastewater, which is considered Hazardous Waste with an EPA designed K047 waste code. The system shall gravity drain to a collection tank in the Contaminated Waste Water Room. All parts of the contaminated wastewater collection system shall have secondary containment: drains, trench drains, piping, collection tank, etc. The clothes washer shall be provided with a catch basin for secondary containment.

All materials and equipment shall be compatible with the collected waste. See Attachment J for a profile of the contaminants.

The collection system (tank, piping, secondary containment vault, alarms etc) shall be designed, constructed, and tested in accordance with the New Jersey Administrative Code Title 7, Chapter 1E (N.J.A.C 7:1E), Discharge Prevention, Containment and Countermeasures/Discharge Cleanup and Removal (DPCC/DCR) regulations and AMC-R 385-100 Chapter 5.

Drains to the contaminated waste collection system shall be provided in the Processing and Machining Areas as indicated in Attachment A and as shown on the architectural sketches. Water from the activation or testing of the deluge system shall drain to the contaminated waste collection system.

The contaminated waste collection system shall be constructed of non-sparking components and be electrically continuous. Drains shall be electrically bonded to the conductive flooring. All interior

surface welds that may contact the liquid shall be smooth finished to 25 Ra (microinches) or smoother.

Trench drains indicated in Attachment A shall be located in front of the room doors (or opening) and extend the full width of the room. They shall be designed so that no water shall escape the room. (The construction of a berm around the room is not permitted) Each rooms' drain and associated piping shall be designed to accommodate the larger of the following peak flows: activation of one steam cleaning station (in water cleaning mode) or the activation of the rooms deluge system. But in no case shall the drain piping be smaller than 4 inches. Each trench drain shall be designed to allow the heavier particulate to immediately settle out in the trough and include a sieve (or other similar device) to prevent large or unsuspended particulate from entering the drain piping. The sieve shall be removable without tools for cleaning and include an overflow to prevent backup of the trench. A removable grating over the trench shall be provided and designed to accommodate the buildings fork lift fully loaded (10,000 lb dynamic load).

A sump shall be provided, prior to the collection tank, to remove explosives by settling. The sump shall be in accordance with AMC-R 385-100 chapter 5.

Piping between the trench drains and the sump shall be pitched to prevent settling of the explosives within the piping. Piping shall have secondary containment with leak monitoring system in the interstitial space. All parts of the piping and drains shall include provisions to access and clean. All pipe segments not welded together shall utilize Waukesha Cherry Burrell type clamps or COR approved equal.

The settling rates and typical particulate sizes shall be determined by the Contractor. The Contractor shall coordinate with the CO and user to test existing contaminated wastewater. The data from these tests shall be used to finalize the sizing of sieves, drains and the settling sump.

The collection tank shall be a single-wall tank constructed of 316 stainless steel in accordance with UL 142 and N.J.A.C 7:1E. Interior welds shall be smooth finished to 25 Ra (microinches) or smoother. The tank shall be located in an impermeable concrete vault. The vault shall be sized to contain the full contents of the tank and shall be located within the ERDLF Processing Area. The collection tank shall be insulated. Any part of the system located in an unheated space shall be freeze protected. The tank shall include a minimum of two manways to access the tank interior for cleaning. A removable ladder for accessing the inside of the tank shall be provided.

The collection tank shall be sized based on the greatest quantity of contaminated water expected to be collected during a 90-day period. As a minimum, the collection tank storage capacity shall accommodate the steam and water cleaning system requirements, a single deluge sprinkler test, 100 gallons for Laundry Room waste plus an additional 10% capacity. Calculated tank capacity shall not be

inclusive of the liquid in the piping system. The tank shall not be smaller than 3300 gallons.

The contractor shall successfully leak test all parts of the system separately, including the secondary containment parts. All system piping shall be hydrostatically tested to 10 psi for 24 hours without pressure drop or leaks. The secondary containment may be pneumatically tested.

6.4.8 Identification and Labeling

Identification and labeling shall be in accordance with ANSI A13.1 and the following.

Piping shall be provided with permanent identification labels and flow arrows. Labels shall be installed at each change of direction, point of entry and in congested areas but shall not be spaced more than 25ft apart.

Valves and components shall be provided with identification tags. Tags shall be made of brass or engraved laminated plastic, indicating the service and item number. Tags shall be 35 mm (1-3/8 inch) minimum diameter and marking shall be stamped or engraved. Indentations shall be black for reading clarity. Tags shall be attached with No. 12 AWG, copper wire, chrome-plated beaded chain or plastic straps designed for that purpose.

6.5 FIRE PROTECTION

6.5.1 General Design Requirements

A complete wet-pipe fire protection sprinkler system is required, covering all areas of the ERDLF (except the Explosives Storage Magazines). The sprinkler system shall be designed and installed in accordance with UFC 3-600-01, NFPA 13, NFPA 20, NFPA 25, NFPA 101, DoD 6055.9-STD, DA PAM 385-64, ARMY AR 385-64, AMR-C 385-100, International Building Code, UFGS 13930A, and UFGS 13851A.

Ultra high speed deluge sprinkler systems shall be provided for the protection of personnel, equipment, and buildings in the areas identified in Attachment A. The deluge systems shall be designed and installed in accordance with UFC 3-600-01, NFPA 15, NFPA 20, NFPA 25, NFPA 101, DoD 6055.9-STD, DA PAM 385-64, ARMY AR 385-64, AMR-C 385-100, International Building Code, UFGS 13945A, and UFGS 13851A.

The NFPA hazard classification of each area of the building is indicated in Attachment A.

The automatic sprinkler systems shall be provided with seismic type bracing in accordance with UFC 3-600-01 paragraph 6-9.

The sprinkler system riser shall be provided with an alarm check valve with all associated trim including a pressure type flow switch. All system control valves shall be electrically supervised. Globe valves shall be used on the sprinkler main drain.

Intermediate temperature rated sprinklers shall be provided for mechanical rooms and equipment rooms where required.

All piping and equipment installed in energetic areas (all spaces in the Processing and Machining areas) shall have non-sparking components and shall be explosion proof. The entire fire protection system shall be electrically continuous (e.g. piping, valves, hangars, equipment, etc.)

Piping and ductwork in the Administration Area shall be concealed. Piping and ductwork in the Machining and Processing Areas may be exposed.

Final testing of the deluge systems shall not be performed until after the Government has installed the machining and processing equipment. This will require the Contractor to return to the site to perform the final tests up to 6 months after beneficial occupancy of the building.

6.5.2 Fire Flow Testing

The contractor shall perform two fire flow tests using two different fire hydrants near the new building location. The contractor shall provide all equipment required to perform the test. The contractor shall coordinate the test with the COR, local DPW and Fire Department. The tests shall conform to NFPA 291 standards and shall indicate static pressure available, residual pressure (and flow rate) at full flow. The fire flow test shall be graphed out to determine the water flow rate at 20 psi and at the hydraulic determined point for the demand area. Tests shall be conducted,

submitted, and the report approved prior to designing the sprinkler system. Approved test results shall form the basis for the sprinkler system design.

6.5.3 Sprinkler Supply Water

Since fire flow test data is not available for this RFP, the Contractor shall assume that the water supply is insufficient to directly feed the sprinkler systems and an underground firewater storage tank and fire pump is required.

If the above Contractor conducted sprinkler tests and hydraulic calculations show that a tank is not necessary, the Contractor shall submit this information to the COR for further direction.

6.5.4 Hydraulic Calculations

Hydraulic calculations shall be performed in accordance with NFPA 13 except that calculations shall be performed by computer using software specifically designed for fire protection system design. Software, which uses k-factors for typical branch lines, is not acceptable. Sufficient calculations shall be performed to fully define the entire system's sizing and prove out the hydraulically most demanding area. Combined hazard classification calculation may be required. A complete set of input and output data and drawings showing hydraulic reference points shall be submitted for approval before any installation work is to be performed.

6.5.5 Automatic Sprinkler Systems

Complete automatic sprinkler protection is required for the ERDLF. The following requirements for automatic sprinkler protection shall apply:

a. Light Hazard Group Classified Areas

1. Light Hazard Classified Areas shall be designed in accordance with UFC 3-600-01, Table 4-1, and NFPA 13.

2. The sprinkler system shall be designed to assure that the total demand of the design area at the specific residual pressure required by the system, plus the hose stream demand can be satisfied by the available water supply.

3. The design density shall be 0.10 gpm/square foot for 60 minutes over the hydraulically most remote 3000 ft2.

4. Hose stream demand shall be 250 gpm for duration of 60 minutes

b. Ordinary Hazard Group 1 Classified Areas

1. Ordinary Hazard Group 1 Classified Areas shall be designed in accordance with UFC 3-600-01, Table 4-1, and NFPA 13.

2. The sprinkler system shall be designed to assure that the total demand of the design area at the specific residual pressure required by the system, plus the hose stream demand can be satisfied by the available water supply.

3. The design density shall be 0.15 gpm/square foot for 60 minutes over the hydraulically most remote 3000 ft2.

4. Hose stream demand shall be 500 gpm for duration of 60 minutes

c. Ordinary Hazard Group 2 Classified Areas

1. Ordinary Hazard Group 2 Classified Areas shall be designed in accordance with UFC 3-600-01, Table 4-1, and NFPA 13.

2. The sprinkler system shall be designed to assure that the total demand of the design area at the specific residual pressure required by the system, plus the hose stream demand can be satisfied by the available water supply.

3. The design density shall be 0.20 gpm/square foot for 90 minutes over the hydraulically most remote 3000 ft2.

4. Hose stream demand shall be 500 gpm for duration of 90 minutes

d. Extra Hazard Group 2 Classified Areas

1. The hazard classification requirements is defined per UFC 3-600-01, para 6-9, and shall comply with DoD 6055.9-STD, and DoD PAM 385-64. Requirements for International Building Code Group H occupancies shall be followed in the absence of specific guidance in DoD 6055.9-STD. Additional requirements are found in NFPA 13, DA PAM 385-64, Army AR 385-64, and AMR-C 385-100.

2. The sprinkler system shall be designed to assure that the total demand of the largest fire area at the specific residual pressure required by the system, plus the hose stream demand can be satisfied by the available water supply.

3. The design density shall be 0.50 gpm/square foot for 120 minutes over the hydraulically most remote 3000 ft2.

4. The hose stream demand shall be 750 gpm for duration of 120 minutes.

e. Ultra High Speed Deluge System

1. Ultra-high speed deluge systems shall be provided at each piece of equipment indicated in Attachment A for the protection of personnel, equipment, and the building. The systems shall have a response time of 100 milliseconds or less, measured from the time that an

energy source is presented to the detector to the time of initial water flow from the critical nozzle, which is normally the nozzle closest to the hazard. For bidding purposes, the Contractor shall base his estimate on providing ultra-high speed deluge systems at each location indicated in Attachment A. Each location will have a Government installed piece of equipment where a high hazard operation will take place. The Contractor shall assume that each piece of equipment will require three deluge heads and three sensors. The Contractor shall be responsible to perform a survey of the Government equipment, which is located at various buildings (approximately 28) within ARDEC, in order to obtain any information necessary to properly analyze, design, and install the deluge system for each piece of equipment. Some equipment may require more, and some less, than three deluge heads (nozzles) and sensors. Where the Government equipment can not be installed after deluge piping/nozzle installation, due to a conflict with piping and/or nozzles, the Contractor shall notify the Government well in advance, to allow for the equipment installation prior to the perceived conflicting piping/nozzle installation. Failure of the Contractor to properly notify the Government in this regard shall result in the Contractor removing/reinstalling conflicting work at the Contractor's expense, to allow installation of Government equipment.

2. Ultra-high speed detector systems shall consist of preprimed deluge systems with ultraviolet or infrared detection equipment and optical flame detection equipment, which views the hazard.

3. Heat detection equipment may be acceptable if the equipment meets the response time requirements, complies with the explosion proof requirements, and is acceptable in other respects (as determined by the Contracting Officer).

4. Complete automatic supervision of the deluge system shall be provided so that any deficiency that develops that would affect the speed or reliability of operation shall give a distinct alarm separate from the water flow alarm.

5. The ultra high speed deluge systems shall be designed to assure that the total demand of the largest fire area at the specific residual pressure required by the system, plus an allowance for hose stream can be satisfied by the available water supply.

6. The ultra high speed deluge system water demand shall be 0.50 gpm/square foot, over the design area for 15 minutes.

7. The hose stream demand shall be 750 gpm for duration of 120 minutes.

8. Piping shall be pitched ¼ inch per 10 feet, with air bleeders at all high points. Pipe runs and bends shall be kept to a minimum. Galvanized piping shall be used for deluge systems.

9. Single source proprietary fire protection system equipment and components are unacceptable from a service and maintenance standpoint and shall not be made a part of the complete fire protection sprinkler system design. The design shall not utilize primers or explosive charges to operate the system.

10. The deluge system shall drain to the Contaminated wastewater Collection System.

6.5.6 Identification and Labeling

Identification and labeling shall be in accordance with NFPA 13 and NFPA 15.

6.5.7 Miscellaneous

Sprinkler system supply piping (exterior to the building) shall be as indicated in the civil requirements. The underground main shall be installed, tested and documented per NFPA 24.

All tests and planned discharges of the deluge systems and the wet pipe sprinkler systems must be contained for disposal in accordance with EPA regulations and requirements.

Portable fire extinguishers shall be installed per NFPA 10 in recessed or semi-recessed extinguisher cabinets.

6.6 CONVEYING SYSTEMS

6.6.1 General Design Requirements

Room and load requirement for the hoists shall be as indicated in Attachment A. Areas of coverage for each room shall be as indicated on the Architectural requirements sketches.

6.6.2 Process Area Hoists

Hoists in the Processing Areas shall be air chain type designed and constructed to CMAA 70 Class B (light service) (or better) for indoor operation in a hazardous environment with hoists in accordance with ASME HST-5. The hoist system shall be configured with a motorized (air driven) trolley type suspension. The hoist and trolley system shall be spark-resistant construction including a stainless steel load chain and brass hook. The hook lift travel shall be from the finished floor to a minimum of 10 feet above the finished floor.

Air for the hoists may be provided from the Compressed Air System if it meets the manufacturers recommendations.

6.6.3 Machining Area Hoists

Hoists in the Machining Areas shall be hand chain manually operated type designed and constructed to CMAA 70 Class B (light service) (or better) for indoor operation in a hazardous environment with hoists in accordance with ASME HST-2. The hoist system shall be configured with a manual trolley type suspension. The hoist and trolley system shall be spark-resistant construction including a stainless steel load chain and brass hook. The hook lift travel shall be from the finished floor to a minimum of 10 feet above the finished floor.

END OF PART 6

PART 7 ELECTRICAL DESIGN

7.1 ELECTRICAL SYSTEMS

7.1.1 Coordination

Electrical work shall be coordinated through the Contracting Officer Representative.

7.1.2 Electrical Design, Analysis and Narrative

The Contractor shall submit the design, design analysis, and design narrative for the Explosive R & D Loading Facility, (ERDLF), and all explosive storage facilities, and exterior areas.

Provide the following minimum information in the design analysis:

a. Load calculations; load factors, including allowance for future loads.
b. Lighting calculations for all interior areas, parking areas and site.
c. Short circuit calculations and ampere interrupting capacity (AIC).
d. Electrical coordination study.
e. Voltage drop calculations.
f. Electrical Design Narrative

7.1.3 Commercial Codes and Design Manuals

Design and installation shall conform to the latest editions of the references listed below, unless otherwise indicated herein.

ANSI C2, National Electrical Safety Code.

ANSI C57.12.00 General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers.

ANSI C57.12.26 Requirements for Pad-Mounted, Compartmental-Type, Self-Cooled, Three-Phase Distribution Transformers for use with Separable Insulated High-Voltage Connectors, High-Voltage, 34500GrdY/19920 Volts and Below; 2500 kVA and Smaller.

ANSI C57.12.27 Conformance Requirements for Liquid-Filled Distribution Transformers Used in Pad-Mounted Installations, Including Unit Substations.

ANSI C84.1, Electric Power Systems and Equipment - Voltage Ratings.

ANSI A117.1, Buildings and Facilities - Providing Accessibility and Usability for Physically Handicapped People.

ANSI/IEEE Std. 242, Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems. (The Buff book.)

IES, Lighting Handbook, Ninth Edition.

NFPA 70, National Electrical Code.

NFPA 72, National Fire Alarm Code.

NFPA 780, Lightning Protection Code.

NFPA 101, Code for Safety to Life from Fire in Buildings and Structures.

Americans with Disabilities Act (ADA)- Accessibility Guidelines for Buildings and Facilities.

UL 268, Smoke Detectors for Fire Protective Signaling Systems.

UL 96A, Installation Requirements for Lightning Protection Systems.

US Army Corps of Engineers Standard Detail 40-06-04, Lighting Fixtures, Dated October 1997.

TM 5-811-1 Electric Power Supply and Distribution 28 Feb 95

TM 5-811-2 Electrical Design, Interior Electrical System (Incl C1) 01 Sep 83.

TM 5-811-3 Electrical Design: Lightning and Static Electricity Protection 29 Mar 85.

TM 5-811-6 Electric Power Plant Supply 20 Jan 84.

TM 5-811-14 Coordinated Power Systems Protection 25 Feb 91.

TI 811-16 Lighting Design 03 August 1998.

UFC 3-600-01 (2004) Design: Fire Protection Engineering for Facilties.

UFC 3-520-01 Interior Electrical System, June 2002

IEEE C62.41 (1991) Surge Voltage in Low Voltage AC Power Circuits.

TI 811-12, Utility Monitoring and Control Systems, 10 Sep 98. 25.

ER 1110-345-700, Design Analysis, Drawings and Specifications

DA PAM 385–64 Ammunition and Explosives Safety Standards, 15 Dec 1999

AMC-R 385-100 Army Material Command Safety Manual

NFPA 30 Flammable and Combustible Liquids Code

NANP-1110-1-1 Manual of Standard Procedures for Planning Design

7.1.4 Specifications

Required electrical specifications are listed in Part 11. These

specifications are based on the UFGS Guide Specifications for Construction and are unedited. The designer shall edit the specifications as per the guidance of ER 111-345-700, Design Analysis, Drawings and Specifications. Additional specifications shall be provided as necessary to fully cover Contractor's design and construction of this project.

7.2 EXTERIOR ELECTRICAL

7.2.1 Scope

The facilities shall receive power from A.R.D.E.C.'s existing (12.47KV) medium voltage (MV) circuit, which is located across the street from the site. All electrical work associated with the existing 12.47KV medium voltage circuit shall be coordinated with Sussex Rural Electric Cooperative (S.R.E.C.) and the Contracting Officer's Representative. See Section 00800, for additional information. The new primary service shall be fed underground from the nearest utility pole to a new pad mounted exterior transformer. The new 12.47KV-480/277V three-phase liquid filled pad mounted exterior transformer shall provide a new underground service to the Explosive R. & D. Loading Facility. A spare 4″ conduit shall be installed from the new pad mounted exterior transformer to the service equipment location interior to the building and be capped at both ends.

The new 12.47KV- 480/277V three phase liquid filled pad mounted exterior transformer shall be provided and installed for the Explosive R. & D. Loading Facility by S.R.E.C. This contractor shall submit the calculations indicating the actual total connected electrical load to S.R.E.C. and the Contracting Officer's Representative for review. Upon acceptance of the submitted data, S.R.E.C. will provide the requirements that shall be executed by this contractor regarding the following that will be a part of this contract:

Requirements regarding pad mount transformer:

- Excavation for new transformer pad.
- Excavated area to be filled with ¾″ crushed stone.
- Requirements regarding transformer containment dike.
- Requirements regarding transformer counterpoise ground.
- Requirements regarding the installation of the first (TEN) feet of underground conduit(s) for the MV primary conductors.
- Requirements regarding the construction of the concrete transformer pad.

The Explosive R. & D. Loading Facility shall have an electrical room with a main distribution switchboard which will serve panelboards for power and lighting throughout the facility and for all the explosive storage facilities.

7.2.2 General Requirements

The design, materials, equipment and installation shall be in accordance with the requirements of this section and with the Guide Specifications as listed in Part 11.

7.2.2.1 Labeling

All materials, equipment, fixtures and appurtenances shall be labeled by Underwriters Laboratories, Inc., Factory Mutual, or a similar organization acceptable to the Government.

7.2.2.2 Routing and Location

The routing of the new underground service entrance lateral shall be approved by and coordinated with the Contracting Officer's Representative and S.R.E.C. The new electrical underground service entrance lateral shall not be located under streets, sidewalks, parking areas or under other exterior pad mounted equipment.

7.2.2.3 Voltage

The primary system voltage is 12.47KV, 3 phase, 4-wire, solidly grounded wye connected. The secondary system voltage will be 480/277V, 3 phase, 4-wire, solidly grounded wye connected.

7.2.2.4 Available Fault Current

For purposes of design, the Contractor shall verify the fault current available with Sussex Rural Electric Cooperative (S.R.E.C.). This available fault current shall be used as the basis for the final system design.

7.2.2.5 Fault and Overcurrent Protection

Line-side and load-side overcurrent and fault protection devices shall be coordinated to isolate any electrical fault from the rest of the system and for all overload conditions. After contract award, the Contractor shall contact the Contracting Officer Representative and Sussex Rural Electrical Cooperative to obtain the information (i.e., site one lines & etc.) necessary to provide this coordination.

7.2.2.6 Phase Conductors

The 480/277V underground service entrance conductors shall be insulated copper conductors consisting of type USE insulation and sized according to the calculated load plus 125% and pursuant to the NEC (National Electrical Code).

7.2.2.7 Grounding Conductors

One grounding conductor sized according to the NEC shall be installed in each conduit with each set of phase conductors when conductors are run in parallel.

7.2.2.8 Burial Depths

Direct-buried conduit or other raceways shall be installed to meet the minimum cover requirements of the NEC Table 300.5 (for conductors rated 600 volts and less) and NEC Table 300.50 (for conductors rated over 600 volts). The Contractor shall be responsible of all damage to duct lines occurring during site preparation.

7.2.2.9 Warning Tape

Provide brightly colored plastic tape not less than 3 inches in width and suitably inscribed at not more than 10 feet on centers, or other approved dig-in warning indication, shall be placed approximately 12 inches below finished grade levels of trenches.

7.2.2.10 Telephone Cable

Telephone system installations shall not occupy the same trench as electrical power cables.

7.2.2.11 Spare Conduits

One spare conduit, with pull cord, shall be installed in all ductbanks. The spare conduit shall include capped risers into all pad-mounted equipment.

7.2.2.12 Utility Poles

All work associated with the power poles shall be coordinated with the Contracting Officer's representative and Sussex Rural Electrical Cooperative.

7.2.3 Pad-Mounted Equipment

Equipment to be pad mounted shall be reviewed and approved by the Contracting Officer’s Representative and S.R.E.C. during the design and construction phase.

7.2.3.1 Equipment Pads

See the structural section of this RFP for construction details. In addition, the pads shall have conduit windows which shall be grouted before installation of the equipment. The pads shall extend 12" beyond the equipment silhouette or footprint and shall provide both physical support for the equipment and serve a 'housekeeping' function. The pads shall have a #4/0 bare copper cable counterpoise ground which shall be buried and shall encircle the pad. Equipment shall be attached as required by UFGS 16070A.

7.2.3.2 Equipment Grounding

¾" x 10'-0" copper clad ground rod shall be installed in a conduit window of each equipment pad (where transformer pads have more than one conduit window, the ground rod shall be installed in the secondary/low voltage window). The pad's counterpoise shall be connected to the ground rod with two run of #4/0 copper cable. All grounding connections shall be exothermic type connections. The equipment grounding conductors shall be AWG #4/0 bare copper.

7.2.4 Service Entrance

Each building shall be fed from its transformer underground, via secondary conductors in duct sized for the connected load of that building. Each service line that provides power to an explosive storage facility shall be run underground from a point at least 50 feet away from the facility. The exterior line side of the main disconnecting switch or circuit breaker shall be provided with lightning arrestors. The service entrance conductors shall not be larger than 500 kcmil. If the ampacity of the total load exceeds the ampacity of 500 kcmil wire, then parallel runs of conductors shall be used. Parallel runs shall be installed as required by the NEC. Service entrance location shall be coordinated with the Contracting Officer representative and Sussex Rural Electric Cooperative.

7.2.5 Sizing Feeders and Transformers

Contractor shall provide sizing calculations for all feeders and transformers to Sussex Rural Electric Cooperative (SREC) for approval. Estimated loads shall be included in the calculations for future and spare equipment, and all equipment designated to be in the facility. A minimum of 25% spare capacity shall be provided for future loads. The Contractor will be required to provide written certification to SREC that the electrical services meets all the appropriate electrical codes in force at the time of his contract.

7.2.6 Exterior Lighting

IES Handbook recommendations, including cutoff fixtures and shields, shall be used to minimize light trespass. Lighting shall be provided for walks, parking areas, and building perimeters. Fixtures shall be visually compatible with the base compatibility standards. Pole mounted shoe-box type fixtures shall be used. All exterior fixtures shall be submitted to the Contracting Officer Representative for review. Fixtures shall have a dark bronze finish.

7.2.6.1 Site Lighting, Roadway and Uncovered Walkways

Site lighting shall be required. Parking area, roadway and uncovered walkway lighting shall be pole top mounted shoe-box type fixtures with high pressure sodium lamps, 2 FC (foot candles) average with a uniformity ratio of 4:1. Aluminum type poles shall be provided. Wind loading for design of exterior lighting fixtures and poles shall be 100 MPH with a 1.3 Gust Factor.

7.2.6.2 Enclosed and Covered Walkways

Pendant mounted compact fluorescent industrial dome weatherproof fixtures for the enclosed and covered walkways shall be provided. Ballasts/Fixtures shall be suitable for cold weather conditions. A lighting level of 10 foot-candles, shall be maintained in the enclosed and covered walkways.

7.2.6.3 Wall Mounted Lighting Fixtures

Provide wall mounted 100-Watt high pressure sodium lighting fixtures at each personnel door and overhead door and around the Explosive R & D Loading Facility and the Engineering Work Space. Provide a wall mounted 100 Watt high-pressure sodium lighting fixtures above each Explosive Storage Facility door.

7.2.6.4 Exterior Lighting Control

The parking area and exterior building lighting to be controlled by photo electric cell with by-pass H-O-A (hand-off-auto) switch capabilities.

7.2.6.5 Underground Conduits

Provide underground conduits with branch circuit wiring to supply the parking lot lighting.

7.2.7 Miscellaneous

7.2.7.1 Utility Crossings

Clearances from existing and new utilities (water, gas, sewer, etc.) shall be as specified in ANSI C2.

7.2.7.2 Underground Splices

Underground connections or splices shall not be permitted in primary or secondary conductors.

7.3 INTERIOR ELECTRICAL

7.3.1 General

The Contractor shall provide a complete electrical system as required by the National Electrical Code and shall be in compliance with the DA PAM 385–64 and AMC-R 385-100. The Contractor shall also provide power to ALL equipment. The contractor shall coordinate the equipment installation with the user. The Contractor shall also be responsible for coordinating between his Sub-Contractors for control power and control mechanical equipment.

7.3.1.1 Enclosure Covers

Enclosures shall have clamp style covers and shall have a locking provision with utility-type seals.

7.3.1.2 Fault and Overcurrent Protection

Line-side and load-side overcurrent and fault protection devices shall be coordinated to isolate any electrical fault or overload from the rest of the system. All overcurrent protection devices shall be fully rated. Series rated systems are prohibited.

7.3.1.3 Labeling

All materials, equipment, fixtures and appurtenances shall be labeled by Underwriters Laboratories, Inc., or a similar acceptable organization.

7.3.1.4 Clearances

Clear space shall be provided around electrical switchboards, panelboards, transformers, switches, and controllers, electronic consoles, equipment, and other items, for normal maintenance and operation as required by the NEC.

7.3.1.5 Electrical Equipment Space Allocation

Dedicated space shall be provided for the housing of electrical and electronic/communications equipment and components. Electrical and electronic/communications equipment rooms and closets, as appropriate, shall be provided separately from spaces used to house mechanical and other non-electrical and non-electronic equipment and components.

7.3.1.6 Electrical Equipment Space Conditioning

Electrical and electronic/communication equipment rooms and closets shall be provided with the environmental air quality necessary to maintain proper temperature and where necessary relative humidity levels required for the safe and effective operation of the equipment to be housed therein without deterioration of that equipment.

7.3.2 Service Entrances

7.3.2.1 Service Equipment

The Explosive R & D Loading Facility shall be provided with a switchboard equipped with a distribution section containing molded case circuit breakers, a main and metering section containing a multi-function watt-hour meter capable of displaying volts amps, kVA, kWH and have a demand register and capability for future pulse indicator in accordance with ETL 94-2 Utility Meters in New and Renovated Facilities. Cable limiters shall be provided for the service entrance cables for the Explosive R & D Loading Facility. The cable limiters should be located at the transformer secondary and at the main service entrance service panel.

7.3.2.2 System Ground

A grounding and bonding system shall be provided for the Explosive R & D Loading Facility, covered walkways, and each Explosive Storage Facility as required by the NEC and shall be in accordance with DA PAM 385-64 and AMC-R 385-100. Any metal structure shall be grounded in accordance with the above regulations. Each building shall have a separate counterpoise. Each counterpoise shall completely enclose the respective structure. Each counterpoise shall be installed a minimum of three feet outside each building's foundation and a minimum of 3'-0" depth. Each counterpoise shall consist of #1/0 bare copper cable which shall be connected to the building's respective service entrance neutral/grounding bonding point with a minimum of two #1/0 copper cable grounding electrode conductors and per other requirements in the NEC. In addition each counterpoise shall be connected to the building's respective grounding system with #1/0 copper cables where required by NFPA 780 for lightning protection systems, (a minimum of 4 connections shall be provided). Additional electrode conductors shall be physically protected, and shall be bonded to the electrode with exothermic welds. Steel, slab and footing re-bar and all metallic building components shall be bonded to the respective ground systems prescribed in DA PAM 385-64. Only approved copper braided grounding jumpers shall be used to connect metal objects that will flex the jumpers (i.e. bonding of metal doors and metal door frames). The means shall be provided in each room to bond each piece of Government equipment indicated to be provided or installed later. The final design shall insure that the system will have no ground loops for protection of the equipment.

7.3.2.3 Sizing Services and Feeders

Sizing calculations shall be provided in the format used in the National Electrical Code, Appendix D, Examples. Estimated loads shall be included in the calculations for future and spare equipment, and all equipment designated to be in the facility. A spare load capacity of 25% shall be included for this facility to be used when sizing transformers.

7.3.2.4 Transformer Application Guide

Transformers ETL 1110-3-412, "Transformer Application Guide" shall be used in the selection and application of transformers and dielectrics. Transformers shall be NON-PCB, NON-CSP (contained protection).

7.3.2.4.1 Nonlinear Loads.

Nonlinear load requirements shall be verified for each power

distribution area and identify equipment and building harmonic ratings. For those areas with high nonlinear load, "K" factor rated transformers are required. Provide a schedule identifying the "K" factor rating for each area.

7.3.2.5 Energy monitoring and Control Systems (EMCS)

Connections for monitoring electrical consumption for the Explosive R & D Loading Facility shall be in accordance with TI 811-12, Utility Monitoring and Control Systems. Contractor shall coordinate all hardware and software requirements of the EMCS system with the Contracting Officer Representative. See Part 6, Mechanical Design, for additional information.

7.3.3 Panel Board Feeders

Panelboard feeders from the service entrance equipment shall be sized to supply the full load rating of the panel they serve, plus minimum 25% spare capacity.

7.3.4 Panelboards

Secondary and local panelboards shall be sized for a minimum of 125% of the demand load they serve. They shall be fully rated for the available fault current, and furnished with main circuit breakers full sized bolt-on branch breakers, insulated neutral busses and bonded equipment grounding busses. Panelboards shall be recessed, or surface mounted, with flush fronts and hinged doors. Panelboards shall be located near the loads they serve. Twenty-five percent of single pole spaces (minimum) shall be provided for spares. The Contractor shall provide and install printed labels, in the panelboard, for all installed circuits. Panelboard buses shall be copper. Aluminum buses shall not be allowed. Contractor shall coordinate panelboard locations with Contracting Officer Representative.

7.3.4.1 Load Separation.

Panelboards which supply power for user computer and data processing loads shall be separate and distinct from the panels which supply the HVAC and other building loads and shall have oversized neutral bus and conductor (200% rated). TVSS (Transient Voltage Surge Suppression) shall be provided panelboards that serve computer, data processing loads and sensitive loads.

7.3.5 Conductors

All conductors shall be copper. Aluminum conductors are not permitted. All conductors installed under this contract shall be no smaller than #12 AWG (American Wire Gage). However, conductors installed under this contract that are “non-power” related conductors such as, but not limited to; audio related circuitry, video related circuitry, communication circuitry, circuits and equipment operating at less than 50 volts, Class 1, Class 2 and Class 3 remote-control, signaling and power-limited circuits shall be the required AWG (American Wire Gage) installed in accordance with the manufacturers recommendations and further conforming with all applicable codes and standards. All conductors shall be installed in conduit. Conduits installed shall be of the type material required for the specific application as required by the NEC (National Electrical Code.) Installation of all conduits shall be in conformance with the applicable NEC code article for that specific type material. Insulation types THWN, THHN or THW conforming to UL 83 shall be

used. All Class 2 circuits (Including thermocouple circuits) shall be run in separate raceways from conductors of electric light and power circuits, per NEC Article 725.

7.3.6 Wiring Methods

Wiring methods shall be as required by the NEC and UFGS specifications whichever is more stringent.

7.3.7 Branch Circuits, Receptacles and Outlets

All general receptacle and lighting circuits shall be 20 Ampere circuits, fed by 20 Ampere circuit breakers. All branch circuits required by the National Electrical Code shall be provided. Receptacles on opposite sides of common walls shall be horizontally offset.

7.3.7.1 Separate Circuits

Lighting and receptacles shall be on separate branch circuits.

7.3.7.2 Outlets per Circuit

General purpose receptacles shall be installed per the N.E.C. Receptacles in the office areas shall be limited to four (4) duplex receptacles per circuit.

7.3.8 Isolated Ground Receptacles

Isolated ground receptacles to serve computer loads shall be provided. The grounds for these receptacles shall be run to the isolated ground bus in the respective panel. Isolated ground receptacles shall be orange colored. All circuits serving computer loads and receptacle circuits shall be provided with a dedicated neutral conductor

7.3.9 Interior Receptacles

Convenience receptacles shall be NEMA 5-20R Ivory, located along the wall at maximum 20' spacing or as indicated elsewhere in this document. Receptacles shall be specification grade or better. The Contractor shall coordinate with the Contracting Officer Representative for specific locations of receptacles. The location of all receptacles shall be approved by the Contracting Officer Representative.

Open office spaces shall be served via an above ceiling wiring distribution system. This system will be a combination of conduit, wireways, cable trays, and telepower poles. In areas where system furniture is provided, channels which are made to connect the system furniture partitions to the above ceiling wiring distribution system shall be utilized in lieu of telepower poles.

7.3.9.1 Ground Fault Current Interrupting (GFCI) Receptacles

GFCI receptacles shall be provided as required by the NEC. GFCI receptacles shall be located in restrooms, janitor closets, mechanical rooms, vestibules and building exteriors. All receptacles serving water fountains or located within 6'-0" of a water source shall be GFCI type.

7.3.9.2 Mechanical Room Receptacle

A general use GFCI receptacle shall be located in each mechanical space and mounted at 48" A.F.F.

7.3.9.3 Restrooms

Restrooms shall have a ground fault receptacle located adjacent to each pair of sink basins. Above-sink fixtures shall not have receptacles.

7.3.9.4 Telephone Backboard Receptacle

Two dedicated 20 ampere circuits serving two quad type receptacles shall be provided at each voice/data backboard. Install No. 6 green insulated ground wire from the telephone equipment backboard to a 3/4" x 10'-0" copper clad ground rod and tie ground rod into building grounding electrode system.

7.3.9.5 Explosion-Proof Receptacles

Explosion proof receptacles shall be provided where required by the criteria and shall be installed as per NEC and shall be in compliance with DA PAM 385–64 and AMC-R 385-100.

7.3.10 Exterior Receptacles

Exterior duplex receptacles shall be GFCI and shall have weatherproof type covers. Provide exterior receptacles on the outside wall of the Explosive R & D Loading Facility every 100 feet.

7.3.10.1 GFCI Receptacles

Provide GFCI receptacles with weatherproof covers at each building access and egress point. GCFI protected weatherproof receptacles shall be installed within 25'-0" of any roof mounted or graded installed building utility equipment (ie. HVAC, Air compressor Steam Station).

7.3.10.2 Overhead Roll-Up Doors

All overhead roll-up doors shall be electrically operated. Motors shall conform to NEMA MG 1. Motors shall be high-starting torque, reversible type with sufficient horsepower and torque output to move the door in either direction from any position. Motor shall produce a door travel speed of not less than two-thirds foot or more than one foot per second without exceeding the rated capacity. Motors shall be operated on current of the characteristics indicated at not more than 3600 rpm. Each door motor shall have an enclosed, across-the-line type, magnetic reversing contactor, thermal overload and undervoltage protection, solenoid-operated brake, limit switches, and control switches. Control equipment shall conform to NEMA ICS 1 and NEMA ICS 2. Control enclosures shall be NEMA ICS 6, Type 12 or Type 4, except that contactor enclosures may be Type 1. In addition to meeting other requirements specified, electrical materials, equipment, and devices for installation in hazardous locations, as defined by NFPA 70, shall be in compliance with the NEC, DA PAM 385-64 and AMC-R 385-100 for compatibility with specific materials and operations being conducted. Controls for overhead doors shall be key activated. Key activated control switches shall be located on the building exterior and be installed in weatherproof enclosures.

7.3.11 Grounding

All equipment, conduit systems, raceway systems, metallic enclosures of electrical devices, switchboard and panelboard enclosures, transformer frames, and equipment shall be be completely grounded in accordance with the National Electrical Code, and as specified elsewhere in this document.

All circuits (lighting, receptacle, etc.) shall be equipped with a separate ground conductor as per the NEC.

7.3.11.1 Grounding and Bonding Requirements for Hazardous Areas

Grounding and bonding requirements for hazardous areas shall be in compliance with NEC and DA PAM 385–64 and AMC-R 385-100. See Section 01011A for hazardous area locations.

7.3.11.2 Conductive Flooring

Conductive flooring shall be provided as per the criteria. Where required, conductive flooring shall be installed as per NFPA 99, UL 779 and UFGS 09670A Industrial Resin-Based Flooring.

7.3.11.3 Ground Bars

Ground Bars shall be provided as per criteria. Ground bars shall be a minimum of 2" x 1/4" and shall be mounted 48 inches above finished floor. Ground bars shall be used to ground various equipment used in the facility during various operations. For bidding purposes, the Contractor shall base his estimate on providing and installing three (3) foot lengths on each wall in each room that is indicated to require ground bars per criteria. The ground bars shall be installed with stand-off support brackets in a manner that meets manufacturer's recommendations. Ground bars shall be connected to the building ground system. Connection shall be exothermic weld. Contractor shall coordinate the exact lengths and exact locations of the ground bars with the Contracting Officer Representative.

7.3.12 Ground Fault Protected Receptacles

Except as otherwise noted, receptacles which are required to have ground fault protection shall be installed on the downstream side of a ground fault protected receptacle.

7.3.13 Lighting

Ceiling mounted fixtures shall be provided for all rooms and interior areas. Lighting control shall be from wall-mounted switches. Design shall be in accordance with recommendations of IES Lighting Handbook. See Attachment A, Electrical Room by Room Requirements, for additional lighting requirements.

7.3.13.1 Fixtures and Lamps

All light fixtures, exit signs, egress light fixtures, etc., shall be heavy commercial grade. Energy efficient fluorescent lighting consisting of T-8 lamps and electronic ballasts shall be provided. Fluorescent fixtures shall have energy saving electronic ballasts. Lamps shall be high efficiency, reduced wattage. Exit lights shall be LED type with emergency battery packs.

7.3.13.2 Egress and Emergency Lighting

Emergency Egress lighting shall be provided as required by NFPA 101. The emergency power shall be obtained from emergency battery packs. Residential grade fixtures are unacceptable and shall be rejected.

7.3.13.3 Fixture Mounting

Fluorescent fixtures shall be mounted as required by the National Electrical Code.

7.3.13.4 Lighting Control

Control switches for general room lighting shall be located at room entrances. Rooms with more that one door shall have three or four-way switches.

7.3.13.5 Explosion-Proof Fixtures

Explosion proof fixtures for hazardous areas shall be provided where required and shall be compliance with the NEC, DA PAM 385–64 and AMC-R 385-100.

7.3.13.6 Office Lighting

All office spaces shall be provided with recessed parabolic fluorescent troffers. Fluorescent lighting fixtures shall utilize 32 watt, T-8 lamps, 3500K with low distortion ballast (<20% THD). A lighting level of 50 foot-candles shall be maintained in office areas.

7.3.13.7 Storage Areas and Mechanical Rooms

Industrial type pendant mount fluorescent fixtures with spring-loaded turret lamp holders and wire basket guards shall be provided for the electrical and mechanical rooms and storage areas. A lighting level of 30 foot-candles shall be maintained.

7.3.13.8 Process Rooms (Hazardous Locations)

Explosion proof fluorescent fixtures shall be provided for all hazardous area locations associated with the Process rooms except where noted.

7.3.13.9 Lab Support Rooms (Non-Hazardous Locations)

Industrial type fluorescent fixtures with spring loaded turret lamp holders with plastic lamp covers (protecto-sleeves) shall be provided for all non-hazardous area locations associated with the Process rooms except where noted.

7.3.13.10 Explosive Storage Facilities

Explosion proof industrial type pendant mount fluorescent fixtures shall be provided for all Explosive Storage Facility interiors. A disconnect switch for the lighting circuit shall be installed outside the Explosive Storage Facility. Switch shall be NEMA 3R type and be able to lock in the open position. A lighting level of 30 foot-candles shall be maintained.

7.3.13.11 Restrooms

Surface mounted gasketed lensed troffers shall be provided for the restrooms. Lighting in the restrooms shall be controlled by motion sensors. Control of exhaust fans shall be as required in the mechanical section. A lighting level of 20 foot-candles shall be maintained.

7.3.13.12 Cold Weather Ballasts

Fluorescent fixtures located within unheated spaces shall be equipped with cold weather ballasts suitable for operation in the Picatinny area.

7.3.14 Fire Alarm Equipment

The Explosive R & D Loading Facility shall be provided with a complete fire alarm system. Fire alarm initiating and indicating equipment shall be provided. The building's control panel shall communicate with the Picatinny's Fire Department's central receiving system via a dedicated telephone line through an auto dialer system. The fire department auto dialer system shall meet the requirements of 911A Notifier or approved equal. All initiating circuits shall be class "A", Style "6", with loop isolators for SLC (Signal Line Circuits) and Style "D" for IDC (Initiating Device Circuits). The NAC (Notification Appliance Circuits) shall be Class "A", Style "Z" designs for all fire protection related systems and structures shall conform to the mandatory and advisory requirements of UFC 3-600-01 (2004) Design: Fire Protection Engineering for Facilties and the National Fire Codes published by the National Fire Protection Association (NFPA). The minimum conductor size for fire alarm circuits shall be 14 AWG (cu) for detection and supervision and 12 AWG (cu) for power. Wiring shall terminate only at a device. The minimum conduit size shall be 3/4 inch. No part of the fire suppression and alarm system shall be from a sole source supplier.

All initiating devices shall report to the facility's main fire alarm control panel located at the center entrance to the facility. One Remote Annunciator Panel shall be provided and located at each end of the Explosive R & D Loading Facility. Remote Annunciator Panels shall meet the minimum requirements of the fire alarm control panel's construction. The system in the Explosive R & D Loading Facility shall employ a minimum of twenty-four (24) area zones and four (4) spare zones. Area zones are sectionalized portions of the facility. The 24 area zones and the 4 spare zones that shall be incorporated into the fire alarm control panel are in addition to the panel zones required for other fire alarm system functions. Fire alarm panel shall be able to disable any one zone without taking the panel off line. The fire alarm system shall be in compliance with DA PAM 385-64 and AMC-R 385-100 for compatibility with specific materials and operations being conducted.

7.3.14.1 Manual Pull Stations

Manual pull stations shall be provided for each building at each exit and where required by NFPA 101. Pull Stations shall not have glass or plastic rods.

7.3.14.2 Flow Indicator Switches

Flow indication switches, located throughout each building, shall be wired to their respective control panels. Each flow switch shall be wired as a separate zone to their respective control panels.

7.3.14.3 Combination Heat/Smoke Detectors

All detection devices shall be spaced and installed in accordance with manufacturers specifications and the latest edition of the NFPA 72 in effect at the time of installation. Heat detection shall be provided in spaces as required by NFPA 72 and as described in the Room-by-Room Requirements, Sections 01011A and 01011B. Heat detectors shall be fixed type and shall be set to trigger at 190 degrees F for mechanical rooms. Rooms other than mechanical spaces that require heat detection shall be provided with fixed heat detectors set to trigger at 135 degrees F.

Smoke detection shall be provided in spaces as required by NFPA 72. The smoke detection unit shall alarm locally and the heat detection unit shall alarm the facility and transmit the alarm to the fire department via a dedicated telephone line. Radium type detectors shall not be used.

7.3.14.4 Duct Smoke Detectors

Smoke detection shall be provided per NFPA 72 and for the main supply duct from each air handler providing more than 2000 cfm. Smoke detection shall be provided for the main return duct to each air handler providing more than 15,000 cfm. All duct smoke detectors 8 feet above finished floor shall have remote key reset switch.

7.3.14.5 Indicating Devices

Combination alarm horn/strobe units or strobe devices shall be located throughout each building, in accordance with NFPA 72. A weather-proof alarm bell shall be located on the wall outside of the mechanical room.

7.3.14.6 Sequence of Operations for the Explosive R & D Loading Facility

7.3.14.6.1 General Alarm

A general alarm condition shall be caused by activation of smoke/heat detectors, duct smoke detectors, manual pull stations, actuation of deluge panels, sprinkler systems and automatic valves. A general alarm condition shall:

a. Illuminate the general alarm LED on the fire alarm control panel.

b. Illuminate the associated alarmed zone's LED on the appropriate initiating zone module in the fire alarm control panel.

c. Activate auto dialer and transmit a telephonic signal to the Picatinny Fire Dept receiver.

d. Activate all audible, visual, and audio-visual units throughout the system (s) until either silenced or reset.

e. Shutdown the HVAC System until the alarm condition is cleared and reset. (Fire alarm control panel reset shall automatically reset the HVAC System).

f. Illuminate the associated alarmed zone's LED on the Remote Annunciator Panels. See paragraph 7.3.15 for information on the remote annunciator.

7.3.14.6.2 Fire Alarm System Trouble activation shall:

a. Illuminate the system trouble LED on the fire alarm control panel.

b. Illuminate the associated trouble diagnostic supervisory alarm LED in the fire alarm control panel.

c. Activate the system trouble sounder within the fire alarm control panel until either silenced or reset.

7.4 LIGHTNING PROTECTION, STATIC ELECTRICITY DISSIPATION SYSTEMS, AND CONDUCTIVE FLOORING

The Contractor shall provide and install a complete Lightning Protection System (LPS) and Static Electricity Dissipation System (SEDS) for the Explosive R & D Loading Facility, and all explosive storage facilities and all new metallic materials, equipment and structures in compliance with the DA PAM 385–64, AMC-R 385-100 and NEC for compatibility with specific materials and operations being conducted. The LPS must be designed to provide a 100-foot zone of protection for the Explosive R & D Loading Facility and areas containing explosives and energetic materials. The LPS shall have a down conductor every 100 feet of the perimeter of the building or fraction thereof. The LPS shall be bonded into the earth electrode subsystem of the facility being protected. Conductive flooring shall be provided for the full floor surface of the rooms required by the criteria, and shall comply with NFPA 99, UL 779. Conductive flooring shall be bonded to the SEDS. Additional static electricity ground rods and clamps shall be provided at all loading dock areas for truck container grounding. Rods and clamps shall be bonded to the SEDS. The above shall be designed and installed to meet the testing requirements of DA PAM 385-64. Testing for the above shall be accomplished in accordance with DA PAM 385-64. The Contractor shall obtain a UL Master Label Certificate for the lightning protection system providing proof that the lightning protection system is in compliance with NFPA and/or UL Standards.

7.5 HAZARD WARNING LIGHT SYSTEM

Rooms within the Explosive R & D Loading Facility, between existing substantial dividing walls (blast walls) shall share common hazard warning lights. Each sector (or groups of rooms between walls) shall have at least four (4) hazard warning lights (2 lights at each end of the enclosed walkway on each side of the building). The hazard lights shall be provided in the enclosed walkways outside the enclosed areas or rooms. The Contractor shall coordinate the exact locations of the warning lights with the Contracting Officer Representative. Warning lights shall be rotating type, rated for 120v AC, UL Listed, and weatherproof. Lens shall be polycarbonate type and red in color. Each group of warning lights within a sector shall be activated (via switch) from any of the rooms within that group. Control switches shall be provided for all hazardous process rooms. Switches shall have engraved plastic nameplate describing switch function (i.e. "Hazard Warning Light System"). Contractor shall coordinate the exact location of control switches for the hazard warning Lights with the Contracting Officer's Representative. See Electrical Room by Room Requirements attachment for classification of rooms in this facility, and required locations of control switches.

7.6 HAZARDOUS AREA CLASSIFICATION

The installation of electrical equipment and wiring within areas containing explosives and energetic materials shall be in compliance with the NEC, DA PAM 385–64, and AMC-R 385-100 for compatibility with specific materials and operations being conducted. The Contractor shall be responsible for sealing all conduits and openings between hazardous and non-hazardous areas. See Electrical Room by Room Requirements attachment for classification of rooms in this facility. Each piece of Government furnished equipment shall be fed by a dedicated branch circuit to that piece of equipment.

7.6.1 Shop Rooms

Shop rooms that will be employed for analysis using commercial equipment that cannot be obtained as explosion-proof will be classified as non-hazardous areas. Provide appropriate dedicated ventilations and grounding, as listed elsewhere in this document. Processed energetic samples shall be prepared in other designated areas within the building where sample preparation operations are approved.

7.6.2 Empty Conduit Systems for Remote Control

Empty conduit system shall be installed as specified elsewhere in this document. System shall be utilized for remote control wiring to Government equipment, and as such, the conduit system shall meet appropriate electrical Hazard Classifications. Seal fittings shall not be sealed until after appropriate wiring had been installed. See Electrical and Communications Room by Room Requirements attachment for rooms in this facility requiring remote control.

7.7 Connection of Government Equipment

The Contractor shall provide all wiring, conduits, and switches as required to provide power for each piece of Government equipment to be installed later, as indicated elsewhere in this document. As part of each power feed, the Contractor shall provide a properly sized electrical disconnect switch for each piece of equipment. The disconnect switches shall be installed outside any hazardous classified areas (in the walkway) if permitted by the NEC. For these areas, the Contractor shall then install the necessary conduits and wiring from the disconnect switches into the hazardous rooms, ending in a explosion proof wall-mounted electrical junction box adjacent to the proposed equipment location. For bidding purposes, the Contractor shall base his estimate on providing and installing an average length of 30 feet of conduit and wiring from the disconnect switch to the junction box endpoint.

7.8 Emergency Generator Requirements

NOTE: All requirements noted in this paragraph are an OPTION to this contract as noted in the front end of this RFP. If OPTION is not awarded, then all loads will be served from normal electrical distribution system.

The Contractor shall provide a generator and associated distribution system with automatic transfer switch (ATS) with by-pass/isolation capability for maintenance and with capability to supply power to meet the estimated maximum demand load of the Rooms indicated to have emergency back-up power for processing equipment, controls, and room lighting. (See Attachment A, Room by

Room requirements, for rooms and equipment requiring emergency back-up power.) The distribution system shall be configured so that loads requiring back-up power are connected to generator in separate panelboards from other loads. The emergency generator shall be a skid-mounted device in a weatherproof enclosure for use outside. Provide a concrete pad for the unit and provide a ground ring around the pad with a ground rod at each corner. This ring shall be used for the grounding connections. Provide annunciator panel at main office area to indicate complete standby/operating condition. Contractor shall acquire required air permit for fossil fuel engines as required in Part 9 – Environmental, of Section 01010 of this RFP.

Required specific features are as follows:

a. Maximum load increase is 100% at 0.8 power factor.
b. Frequency bandwidth shall be 0.25%.
c. Electric starting where the batteries recharge in 24 hours.
d. Provide output breaker located with or adjacent to the unit.
e. The unit shall start within 10 seconds after a power outage.
f. Maximum voltage deviation shall be 10%.
g. Maximum frequency deviation shall be 5%.
h. Recovery time back to bandwidth from a 100% block change in load shall be 15 seconds.
i. Unit shall be designed and manufactured to operate properly during the temperature changes experienced in the range of the area in which it is installed.
j. Provide emergency power generation independent fuel supply for 72 hours of continuous operation at 100% rated load prior to refueling. Fuel shall be diesel, and shall be served by dedicated stand alone above ground storage tank. Generator shall be equipped with a fuel meter and a engine hours meter.
k. Generator and tank shall be located outside the facility, opposite side of blowout walls.
l. ATS shall be located adjacent to the generator in a weatherproof enclosure. The ATS shall automatically operate upon loss of normal power. When normal power is restored, the ATS shall switch back to normal power and the generator shall shut down after a cool down period. The generator shall tie into the Base’s communication network via the building communication system, and shall alarm the Security Building upon the following conditions.

    1. Generator start.
    2. Generator failure.
    3. Loss of normal power.
    4. Transfer switch position. (Normal – Backup power)

END OF PART 7

PART 8 TELECOMMUNICATIONS DESIGN

A structured cabling system solution shall be provided as follows:

8.1 COMMUNICATIONS SYSTEM CRITERIA

The installation shall support Cisco VOIP service. Installation shall comply with TI 800-01, ER 1110-3-110, DA Pamphlet 385-64, and latest EIA/TIA standards, including the following:

1. EIA/TIA Standards 568-B Parts 1 & 2, 2001: Commercial Building Telecommunications Cabling Standard
2. EIA/TIA 569-A, 2001: Commercial Building Standard for Telecommunications Pathways and Spaces
3. EIA/TIA 606, 1996: Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
4. EIA/TIA 607, 2002: Commercial Building Grounding/Bonding Requirements Standard

The communications systems shall be Cisco VOIP (Digital) using equipment specified by Picatinny DPW, and Analog Voice Service. The PBX switch shall contain a Cisco (VOIP) server where a short to medium up link transceiver shall be installed to provide IT support to the new facility.

8.2 COMMUNICATIONS MAIN SERVICE

All new copper telephone cabling and fiber optic cabling shall be installed in a manhole and ductbank system, or along existing aerial poles, as applicable. All aerial communication work shall be coordinated with Sussex Rural Electric Cooperative and the Contracting Officer Representative. New ductbanks shall consist of two direct-buried 4-inch PVC ducts, with one 4-inch duct having four 1-inch inner ducts dedicated to fiber optic cabling. Ducts shall have reinforced concrete encasement when crossing parking areas, roads, and areas subject to traffic. The new facility shall be provided with a new ductbank and manhole system for incoming fiber optic and copper cabling to the facility. Provide two 4-inch PVC with one 4-inch conduit having four 1-inch inner ducts for fiber optic cabling. The new ductbank shall serve the facilities and be stubbed up into the main communication room.

The new facility shall be served by a dedicated fiber optic cable of 12 ST SM (12 Strand Single Mode, 8.3/125 micron). Cables shall comply with EIA/TIA requirements and standard UFGS specifications. All new FO cabling shall be installed in 1-inch inner ducts.

All telephone cabling shall be 24 gauge copper cable with number of pairs determined by the requirements for each building. Cables shall comply with RUS REA Bull 1753F, PE 39 up to 400 pair, and UFGS standards. All new cabling shall be installed in 4-inch ducts, and on poles.

The main data service shall be via a fiber optic (FO) cable from Building #323D and consist of 12-strand single mode (8.3/125 micrometer) via two 4-inch conduits to the facility. The FO cable shall be run within the cable vault in Building #323D then to the equipment rack, and terminates in a splice/patch panel within the rack. Each end of the FO cable shall be terminated in a patch and tested. The (analog) voice service to the Building shall be via a 25 pair copper cable extending from an existing point near the new site to be identified by Picatinny DPW.

The analog voice cable shall be terminated on surge protectors and jumped to equipment racks mounted 110 patch panels. The 110 patch panels are to be used in lieu of 66-block punch down type. The voice cable emanating from existing point shall be spliced to an existing telephone cable.

8.3 PREMISES DISTRIBUTION SYSTEM REQUIREMENTS

8.3.1 Voice over IP (VOIP). The Contractor shall engineer, design, furnish and install a complete VOIP (Cisco) system or approved equal, to match the existing Picatinny Arsenal communication system. (See ATTACHMENT R for drawings of general system configurations and major equipment data sheets).

Major system components:
a. Cisco Ethernet Switch 3524-PWR XL & Cisco Gigabit Ethernet Switch 3508G XL
b. GBIC module port (Cisco WS-G5486)
c. Cisco IP phone 7960 (6 IP telephones with user licenses.)
d. Cisco IP phone 7940 (6 IP telephones with user licenses.)
e. Smart UPS 700 VA/120 volts/l hour backup capacity.

Note: The Contractor shall coordinate with the Using Agency to qualify for the Government GSA discount pricing unless the Contractor can receive a more advantageous price independently.

8.3.2 Analog Telephone System. Analog telephone wall-mounted type 2500 sets shall be provided within the enclosed walkways of the new facility at approximately 50 feet intervals. These analog telephones shall be installed within exterior boxes.

One analog telephone shall be installed outside each magazine in an exterior box, serviced via an underground conduit per safety manual.

Number of sets will be as required.

8.3.3 The Contractor shall install the following fiber optic cabling within the building:

a. 12-strand single mode and 12-strand multimode between telecom closets in the new facility.

b. 2-strand multimode from camera locations within areas noted on Room by Room Requirements attachments to associated control rooms.

8.3.4 Backbone multimode and single mode fiber optic cable shall be installed to support the networks. Fibers will terminate in the corresponding communications closet.

8.3.5 The voice and data network will consist of dual category 6 jacks at each standard outlet. Outlets shall be wall mounted, except for open office area, where outlets will be incorporated into the tele-power pole overhead wiring system serving the system furniture layout. Two outlets will be for voice data uses. The outlets shall be wired to the communications closet in a wireway and conduit system. An open

cable tray may be used within the telecommunications closet.

8.3.6 Outside plant cable will be terminated in the service entrance communications closet.

8.3.7 All wiring voice/data shall be category 6, and be connected using EIA/TIA 568A configuration. All cabling shall be plenum rated, and installed on cable trays, conduits or wireways, whichever is applicable. The FO cable shall be run in inner duct on cable trays. All FO cable shall be terminated on FO patch panels.

The telecom closets in the Facility shall be provided with voice and data equipment racks. Each telecom closet shall be interconnected via to cabling.

Each telecom equipment room shall be provided with racks containing analog voice service data and FO patch panels. Each rack shall be provided with a 700w UPS with standby capacity of minimum 1 hour, and power outlet strip (minimum 5 outlets).

All cables shall be installed in wireways (minimum 4 inch by 4 inch). Two sets of wireways shall be provided and installed in the corridor ceiling carrying cabling.

8.3.8 Other Requirements

A telephone distribution system shall be provided consisting of a plywood backboard with 110 type blocks and telephone building entrance equipment. All fibers shall be terminated on a splice panel and have ST type connectors.

8.3.8.1 House Distribution Cable

The house distribution cable shall be 4-pair, unshielded twisted pair (UTP), category 6 for voice, solid copper station wire, for each outlet. All cable shall be terminated. Each cable shall be numbered and labeled consecutively per room number at both ends in accordance with ETA/TIA 606. All cable shall be plenum rated.

8.3.8.2 Associated Station Installation Equipment

Associated station equipment used in establishing the eight-position, eight-wire modular jack installation such as faceplates, connecting blocks, mounting plates, raceways, etc., shall be of a type and material to comply with FCC part 68 requirements and best commercial practices which meet NEC fire safety requirements.

8.3.8.3 Indoor Conduit System

Pull boxes shall be provided, where necessary, to facilitate cable installation. Between any two pull boxes or termination boxes, no more than two 90-degree bends shall occur with the sum of all bends not exceeding 180 degrees. Pull or termination boxes shall be provided at splice locations, and points where cable or wiring is distributed to other locations. Cable shall not enter or leave a pull or termination box without being in conduit. The Contractor shall size the conduit and install cable such that the air gap around the outside perimeter of the cable and the inside perimeter of the conduit is in accordance with EIA/TIA 569.

The end of conduit shall be either flared or be equipped with collars to prevent damage to cable. The ends shall also be capped or sealed. Any spare conduit installed shall be provided with waterproof pull cables for use on future cable installations. When necessary to install conduit, it shall be comprised of type C steel conduit, pull boxes, bends, cable guards, couplers, and adaptors, along with installation hardware.

8.3.8.4 Connector Blocks

Connector blocks shall be provided to cross-connect and terminate house backbone and distribution cable. Connector blocks shall be 110-type for voice and 110 patch panels for data. Each block shall be equipped with a designation label that shall show its respective pair counts or station cable number. Connector blocks which are not located in a wire closet or equipment closet shall be enclosed in a protective cabinet or housing. Distribution rings and spots shall be provided to hold and support cables in a neat and orderly manner.

8.3.8.5 Testing

All cables, jacks, and connecting blocks shall be tested to ensure that no opens, shorts, grounds, or crossed are present within the system. Testing shall be in accordance with TSB 67, "Transmission Performance Specifications for Field Testing of Unshielded Twisted-Pair Cabling Systems."

8.3.8.6 Cable Support

All telephone and data cables shall be plenum rated and shall be routed in conduit, cable trays, or wireways, whichever is applicable. Cable and wiring support shall be self-supporting (i.e., not rely on or be supported by other pipes, cables, or conduits).

Cables entering and leaving a conduit or duct shall be supported in a manner in which the cable is not stressed at the edge or rim of the conduit. Indoor conduit shall be firmly anchored and supported, and installed IAW NEC.

8.3.8.7 Telephone Service Entrance

The telephone service entrance for the building shall be located in a telephone room with enough space to allow for mounting and maintenance of equipment to support the telephone, data, and alarm systems. This room shall be equipped with fluorescent lights and two electrical outlets on each wall. The distribution frame shall be mounted on 3/4-inch thick plywood backboard. This backboard shall be painted with insulating paint and be sized and located to allow for future expansion of the telecommunications system. All communications rooms shall be provided with 24hr environmental control, as is required by EIA/TIA 569-A, par. 7.2.7. Provide surge protectors on the service entrance cabling. All communication rooms shall be sized in accordance with EIA / TIA standards.

8.3.8.8 Outside Plant Cable Entrance

The outside plant cable entrance shall consist of two 4-inch entrance ducts into the telecom closet. Ducts shall stub up six inches above the floor in the mechanical room. Provide 1/4-inch nylon pull rope in all ducts. The ducts should be buried a minimum of 36 inches and have a minimum bending radius of 36 inches.

Grounding shall be in accordance with EIA/TIA 607 standards. As per Military Handbook 419A, paragraph 2.2, in order to protect personnel and equipment a design goal of 5 ohms resistance for communications systems is required.

8.3.8.9 Inside Wiring and Cable

Inside wiring and cable shall be UL listed and provided IAW National Electrical Code (NEC), Article 800. No cable or wire shall be sized smaller than 24 AWG.

8.3.8.10 Communications Outlets (VOIP)

(This paragraph applies only to administrative type areas; offices, control rooms, etc.)

Dual outlet will consist of two 8-pin modular (RJ-45) type connectors. As a minimum, one dual outlet shall be installed on each wall that is less than 12 feet long. If a wall is more than 12 feet, one dual outlet shall be installed every 8 feet. Each indoor jack shall be an eight-position, eight-wire modular jack (universal service code) RJ-45 type with EIA/TIA 568A configuration, and shall be FCC approved. Both flush and surface mounted outlets shall be provided. Matching faceplates shall also be provided. Wall phone jacks shall use 630A4 type jacks. Voice and data jacks shall have different color codes, coordinated with the 4-pr voice and data cables.

8.3.8.11 Voice and Data System

The facility shall be wired with a complete voice and data system. Outlets shall be provided as required in paragraph 8.3.8.10 and as required elsewhere in this document. Wiring shall be homerun style. All voice and data homeruns shall be concealed where possible. Conductors, wiring method and method of termination shall be as required by the applicable criteria. The telephone service entrance and backboard shall be located in the telecommications closets. The Contractor shall provide patch panels, grounding equipment, service entrance equipment, all conductors and outlets throughout the building. The Contractor shall terminate all outlets to patch panels. Contractor shall provide all patch cords for both ends of the link (at the communication closet and at the User, workstation end). The following quantities are to be provided:

(a) At the Workstation end: 1.5 times the number of communication workstation outlets.
(b) At the Comm Closet: 1.5 times the number of modular jacks on the patch panels terminated with 4-pair cat 6 cables.

8.3.8.12 Voice and Communications Cable

Voice and communications cable shall meet the requirements for Category 6 cable. Voice and data cable shall have different color codes. Contractor shall coordinate color code with Picatinny DPW.

8.3.9 Multi-Mode Fiber Optic Cabling

Two 2-strand multi-mode fiber optic cabling shall be provided for each required camera enclosure. These shall be terminated in the associated control room.

8.4 PA SYSTEM

A general purpose PA system shall be installed throughout the Facility, with speakers located in the enclosed walkways, lobby, open office area, break room, conference room, restrooms, processing, milling, and washing and drying room. The system shall be designed so that sound pressure levels of speakers exceed ambient levels so that messages are audible in ALL areas in the facility. This includes all processing and milling rooms. Explosion proof speakers shall be used in hazardous rated areas. The PA system shall be interfaced to the telephone system to allow telephone paging access in addition to microphone access from all control rooms. PA system's performance shall be in accordance with allowable options in UFGS Specification 16770 PUBLIC ADDRESS and AUDIO VISUAL SOUND SYSTEMS.

8.5 PROCUREMENT OBJECTIVE

8.5.1 The following functional specification is for a cabling system and support structure therefore (hereinafter referred to as "the system") comprised of the wire and cable, terminations, active and passive components, installation, testing, certification, and documentation and any other related labor, services and equipment necessary to make it function to full specification.

8.5.2 The building shall have a fully operational system to be provided by the Contractor on a Subcontractor basis whereby the Contractor shall act as a Subcontractor to the GC for wire, cable, connectors, terminations, labor, and all other aspects of this installation.

8.5.3 The Contractor shall design, lay-out, install, test, and certify all the necessary material, equipment, and miscellaneous hardware as specified by this document and by the manufacturer of the equipment and material specified by this document or chosen by the Contractor.

8.5.4 Any material or components to be included in the system shall be new, unused and in current production by experienced manufacturers whose intent it is that the material and equipment in question be used in the manner proposed by the Contractor.

8.5.5 The Contractor shall provide a completed system complying with all the requirements and specifications set forth in this document. It is the intent of this document to procure a complete communications transport infrastructure ready for use upon occupancy. Any items not specifically called for in the specifications, but normally required to provide such a complete infrastructure, are to be considered a part of the contract.

8.5.6 All scheduling and timing issues necessary to result in successful completion of this project per the completion dates provided to the Contractor shall be coordinated between Contractor and his subcontractors.

8.6 ENVIRONMENTAL REQUIREMENTS

Connecting hardware shall be rated for operation under ambient conditions of -20°C to 60°C (-4°F to 140OF) and in the range of 0% to 95% relative humidity, non-condensing (outdoor and indoor).

8.7 QUALIFICATIONS

Minimum Contractor Qualifications: All work under this section shall be performed by and all equipment shall be furnished and installed by a certified telecommunications contractor, hereafter referred to as the Contractor. The Contractor shall have the following qualifications in Telecommunications System installation:

a. Contractor shall have a minimum of 3years experience in the application, installation and testing of the specified systems and equipment.

b. All supervisors and installers assigned to the installation of this system or any of its components shall have factory certification from each equipment manufacturer that they are qualified to install and test the provided products.

c. All installers assigned to the installation of this system or any of its components shall have a minimum of 3 years experience in the installation of the specified copper and fiber optic cable and components.

8.8 OPERATION AND MAINTENANCE MANUALS

Commercial off the shelf manuals shall be furnished for operation, installation, configuration, and maintenance for all products provided as a part of the premises distribution system. Specification sheets for all cable, connectors, and other equipment shall be provided.

END OF PART 8

PART 9 ENVIRONMENTAL DESIGN

9.1 OVERVIEW

The work includes construction of buildings, structures, and associated site and utility work (see this SECTION, PART 1, paragraph 1.1 Project Description). In addition to the standard construction and related incidental work the Contractor is required to follow special and unique procedures as listed in this Request for Proposal (RFP) package due to the unique and uncommon work that was and is presently being performed at Armament Research Development and Engineering Center, Picatinny (ARDEC). Therefore, the Contractor is herein informed that they must comply with all Environmental requirements, protocols, procedures, and guidelines that are in force and listed within this RFP package. The Contractor's work will include (investigations, design & construction), but not only be limited to excavation/transportation/disposal of potentially hazardous waste; environmental sampling; preparation and obtaining approval of environmental plans and safety plans; and obtaining environmental permits.

9.2 GENERAL REQUIREMENTS

a. The Contractor shall prepare a comprehensive Environmental Work Plan for approval, which shall have sections specifically dedicated to address environmental protection issues and compliance to the National Environmental Policy Act. The Environmental Work Plan shall describe the methods, techniques, and strategies that the Contractor will utilize to comply with all environmental regulations. The Environmental Work Plan shall be submitted through the Contracting Officer's Representative (COR) to the Environmental Affairs Office (EAO) for review and approval prior to the start of any construction activity.

b. The Contractor shall be responsible to certify those workers who require certification and training for specific work and receive the necessary training and certification for working in a hazardous waste site, as ARDEC is currently listed by the USEPA as a National Priority List (NPL) site and a portion of the project site is classified under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). As part of the ongoing CERCLA Site Restoration Program at ARDEC, Remedial Investigations (RI) have been performed. Sampling results have yielded soil and groundwater characterization data that show some locations are contaminated; however, risk assessments have determined that the total non-cancer hazard index for excavation workers is expected to be below the EPA target threshold of 1. General contamination information is listed in Paragraph 9.7 and contained in Attachment V to this RFP; see also PART 1 of this SECTION. Specific and detailed information is retained by the EAO and will be made available for Contractor review upon request.

c. The Work Site as provided to the Contractor will be expected to be free from Unexploded Ordnance (UXO). Prior to initiating

any excavation or other disturbance of the site, the Contractor shall provide through the COR a written request for UXO Survey Clearance Certification from the Safety Office. The request shall clearly describe the planned depth of disturbance and type of work (e.g. demolition, grading, foundation excavation, utility excavation, etc.) and shall include a map/plan clearly defining the limits of intended work, the locations of which shall be field marked/staked by the Contractor in advance of the written request. For deep excavations, the Contractor shall stop work at the 4-foot depth and repeat the full clearance request process, and shall proceed through the next 4-foot interval only after receiving the applicable Certification from the Safety Office through the COR. The Contractor shall allow a minimum of 3 business days from the date of submitting a properly completed request before commencement of the survey, and an additional day for issuance of the Certification. The maximum daily rate of clearance surveying is 5000 square feet for cleared areas and 2000 square feet for wooded or other areas having surface obstacles/interferences. In the event UXO is found during construction, the Contractor shall stop work immediately and notify the COR and Safety Office for further instructions and directions. If the COR then issues a partial (location-specific) or total (project-wide) work stoppage, payment for any associated delay costs from that point in time until the stoppage is rescinded will be handled in accordance with the CHANGES Clause of the Contract Clauses. In general, any subsequent survey and necessary removal/remediation activities will be performed by ARDEC forces, unless specifically requested of the Contractor and handled as a contract modification by the COR.

d. The Contractor shall develop and implement a comprehensive, project and site specific Site Safety and Health Plan (SSHP). The SSHP shall meet the requirements of 29 CFR 1910, 29 CFR 1926, and EM 385-1-1. The SSHP shall include a Hazard/Risk analysis (assessment) for each task and its corresponding location. The Plan shall include the use of a Licensed Occupational Physician, who is board certified in occupational medicine by the American Board of Preventive Medicine. The Licensed Occupational Physician shall be responsible for the determination of medical surveillance protocols and for review of examination and test results performed in compliance with 29 CFR 1910, Section .120 (f), and 29 CFR 1926, Section .65 (f) and paragraph on Medical Surveillance. Additionally, an Industrial Hygienist certified by the American Board of Industrial Hygiene shall visit the site at least once every 2 weeks, or more frequently if needed.

e. Three (3) sets of clean Personal Protective Equipment (PPE), including any required air purifying negative-pressure respirator (excluding safety shoes) shall be provided by the Contractor to the COR for their and any Official Visitors’ use. All waste generated and (or) resulting from the use of PPE and decontamination shall be the responsibility of the Contractor, and shall be properly disposed. The Contractor is herby informed, the Government will make no separate payment for this; therefore, Offerors shall reflect and account for this in their

Price Proposal.

f. Groundwater monitoring wells currently exist in the general vicinity of the proposed structures, fiber optic and other utilities, and Contractor staging/laydown areas. Approximate locations may be found in the November 2003 Phase II Remedial Investigation Report, Volume 2, which is available from the EAO for review by Offerors during the bid preparation period. The Contractor's design and construction shall avoid interference with and damage to, and shall provide positive protection of, all existing wells. Should any existing well require replacement or relocation, it shall be abandoned at Contractor expense and in accordance with all applicable New Jersey Department of Environmental Protection (NJDEP) statutes, complete with full documentation submitted to NJDEP and copied to the EAO and COR.

g. Excavated material satisfactory for backfill shall be returned to the maximum extent practicable to the approximate location from where it was removed in order to minimize the quantity of hazardous or potentially hazardous excess soil (see Paragraph 9.6 of this PART).

9.3 SPECIFIC REQUIREMENTS

a. All debris, refuse, and material generated as a result of this project, and determined not qualified for reuse shall, except as otherwise specified, be removed by the Contractor and properly disposed of off-site. All hazardous material, or material waste generated shall be properly managed, containerized, documented, manifested, and transported for proper disposal off Government property. Material and waste handling and management procedures shall be identified and addressed in the Environmental Work Plan.

b. All salvageable material and proceeds derived from its sale shall be the property of the Contractor with the exception of large trees. All large trees, 6 inches in diameter or larger, shall be cut into 6 feet manageable sections, and transported to the "Salvage Timber Area" in ARDEC.

c. All tree cutting shall be performed from November 15 through March 31. Additionally, Landscape Plan shall identify trees to be cut, and shall be approved by the ARDEC Natural Resource Manager in writing.

d. The finalized and approved copy of the Environmental Assessment (EA) Plan will be prepared by the EAO upon completion of review of the Contractor's 60% Design submittal and resolution of all related comments/issues. The Contractor shall make allowances and necessary changes to the 95% Design after the EA is processed and approved and shall allow a minimum time frame in scheduling the work to reflect the EA approval process; see paragraph 9.5 of this PART. The Contractor's Environmental Work Plan shall reflect and address all conditions and requirements listed in the finalized and approved EA.

e. The Contractor shall obtain all necessary permits including but not limited to the following:

- Aboveground/Underground Storage Tank licenses/permits
- Soil Erosion and Sedimentation Permit
- Stormwater Discharge Permit Associated with Construction Activity
- Sewage Discharge Permit (Rockaway Valley S.A.)
- Boiler and Air Emission Permits
- Construction and Demolition
- Burning Permits

The Contractor shall make allowance and reflect any long lead-time in acquiring all permits and environmental plan(s) for approval from regulating authorities in the scheduling of his work, and in the execution of his work.

f. The Contractor’s Environmental Work Plan as well as the Erosion and Sediment Control Plan to be submitted to Morris County shall reflect and address all aspects of construction water collection and discharge including excavation dewatering water. The work shall comply with Section 7.0 Erosion Control and any related attachments of the Standing Operating Procedure for Soil Management Procedures During Construction Activities (Soil SOP), and with all applicable regulatory requirements including but not limited to the New Jersey Administrative Code (NJAC). For the Contractor’s convenience, be advised that NJAC 7:13-3.3 in general does not allow discharge of dewatering water into waterways or wetlands without treatment except as expressly approved by NJDEP. Discharge of excavation water collected in areas of known or suspected contamination, including any required sampling and chemical testing, shall be performed in accordance with all permit requirements obtained by the Contractor through the EAO. See Paragraph 9.7 of this PART and Attachment V to this RFP for summarized available contamination data. For bidding purposes, Offerors shall assume that water removed from areas of known or suspected contamination will be allowed to be re-injected at Contractor excavated and maintained locations designated by the EAO.

g. The Contractor shall develop a comprehensive project-specific Soil Management Plan. It shall be approved by the COR and by the EAO (see paragraph 9.6 of this PART).

h. ARDEC will delineate the locations and boundaries of any Wetlands and Streams in the Final EA (see paragraph 9.5 of this PART). Refer to PART 2 of this SECTION, and Attachment D to this RFP package, for additional requirements and currently available information. With regard to planned disturbances or encroachment to wetlands and streams or regulated upland ‘transition’ areas, the Contractor shall apply for all necessary permits from the NJDEP through the COR and EAO. The Contractor shall make all efforts to coordinate their design and construction to mitigate and resolve any potential conflicts with the COR and EAO. This coordination and resolution shall be reflected in the final Environmental Work Plan.

i. The Contractor shall develop a containerized gravity-flow hazardous waste plumbing drain system for rooms that have a hazardous waste or contaminated wastewater drain stream. The hazardous waste plumbing drain system shall not be interconnected with the ordinary sanitary waste system in any manner whatsoever. All or parts of the hazardous waste drain plumbing system may be interconnected so that the total or aggregate waste streams may be collected into a common storage tank. See paragraph 6.4.7 Contaminated Wastewater Collection System of this SECTION for specific contaminated wastewater tank and drainage/piping system design requirements. The Contractor has the option to install more than one such storage tank to contain the hazardous waste if necessary. For specific room requirements, see Attachment A 'Room-by-Room Requirements' to this SECTION.

j. The Contractor shall design and construct an approved drainage system as required (by NFPA 15 – Water Spray Fixed System for Fire Protection). Also, if any planned discharge testing of the Deluge System will cause discharge water to disperse onto the floor, the Contractor shall provide means to mitigate and containerize the flow. When sprinkler discharge testing water is dispersed onto the floor, it shall be considered to be hazardous. In no way shall any sprinkler system planned discharge testing water after being contaminated from the floor during sprinkler system testing be allowed to flow into the sanitary or storm sewer system, or leach outside into the soil.

k. The contractor shall coordinate all boiler permits, boiler emission and fuel metering equipment with ARDEC's Central Heating Plant Management. Fuel metering devices shall conform and match fuel consumption in the same units as prescribed in the ARDEC air emission permit. The Contractor shall submit all NJDEP required temporary (construction) and permanent (operational) air emission permit applications for all fossil fuel fired equipment including emergency generators through the EAO, concurrent with submittal of the 60 percent Design submittal.

l. As part of this Construction project, the Contractor shall properly remove and dispose of all Asbestos Containing Materials (ACM) in accordance with all Federal, State, and Local Regulations. All buildings, structures, and items that have ACM shall have its ACM removed prior to any demolition or renovation work. Additionally, prior to the start of any Asbestos related work, the Contractor shall coordinate and consult with the COR, Department of Public Work (DPW), EAO, and Safety Office. All ACM shall be handled and managed with oversight to minimize the potential of producing any air borne Asbestos or creating a hazard. All ACM generated, as a result of this project, shall be removed from ARDEC and properly disposed. The Contractor shall prepare all necessary submissions, to include but not only limited to the following: Work Plans, Site Safety and Health Plans, Permits, Waste Manifest, Transportation Records, Certified Scale Weigh Measurement Records, Air Sampling/Monitoring Data and Plan. All submissions and work

performed shall meet the approval and satisfaction of the regulatory Agencies and the COR.

m. The Contractor is advised that due to the age and conditions of the buildings and structures involved in this project, Lead Based Paint on surfaces are very likely to be encountered during the course of the demolition and renovation work. Additionally, the Contractor may encounter items (e.g. pipes, containment tanks, flooring, siding, etc.) made from lead as part of the demolition and removal. The Contractor shall develop and implement a Material Handling Plan for lead containing material. It shall address the handling, stockpiling, and the method of treatment, recycling, and disposal of lead containing materials. The Contractor shall implement the necessary controls and monitoring measures in completing this project. All debris and materials containing Lead resulting from the project shall be properly disposed, treated, or disposed in accordance to all Federal, State and Local Regulations. All waste material generated for treatment, disposal, or recycling shall meet the requirement of the State-regulated treatment, disposal, or recycling facility. All Work that is related to Lead Containing Material (LCM) shall be coordinated with the COR and Safety Office prior to the start of the work. The Contractor shall prepare all necessary submissions, including but not only limited to the following: Work Plan, Site Safety and Health Plan, Record of Certified Disposal Facility, Transport Records, Waste Manifest, Analytical Data to substantiate Waste Stream, Air Sampling Monitoring and Control Data. All submissions and work performed shall meet the approval and satisfaction of the regulatory Agencies and the COR.

n. The project site is expected to be free from any Polychlorinated Biphenyls (PCB’s)material. In the event any PCB materials or hydraulic fluids are found, the Contractor shall report and remove/dispose them, after having received instructions from the COR.

9.4 MANDATORY DESIGN CRITERIA AND STANDARDS

The Contractor’s design and construction shall comply with the following Federal requirements that are established by executive orders, public laws, local requirements, and other directives that may not be contained in the potential Contractor’s codes, standards, and specifications.

9.4.1 Executive Order 11514

Protection and Enhancement of Environmental Quality, March 5, 1970 as amended by Executive Order 11991, May 24, 1977 directs Federal Agencies to implement NEPA (42 U.S.C. 4321-4361, The National Environmental Policy Act of 1962-19).

The Executive Order requires that all applicants monitor, evaluate, and control on a continuing basis, activities so as to protect and enhance the quality of the environment.

9.4.2 Public Law 95-217, Clean Water Act of 1977, As Amended

This Act establishes the National Pollutant Discharge Elimination System (NPDES) and requires all applicants to apply for a permit for each point source of wastewater discharge and comply with the conditions of each permit.

9.4.3 Public Law 95-90, Clean Air Act, As Amended

This Act requires all applicants to apply for permits to operate and to construct facilities to control stationary air pollutant sources and to comply with the conditions of each permit.

9.4.4 Solid Waste Disposal Acts As Amended By The Resources Conservation and Recovery Act, and Amendments (RCRA), by Public Law 94-580, Solid Waste Disposal Act, as Amended by the RCRA.

This act requires all applicants to properly manage hazardous waste by “Treatment, Storage, and Disposal Facilities (TSDF)”. Proper shipping papers (manifests), packaging, and labeling must be used when transporting hazardous waste. The 1984 amendments apply the requirements to persons who generate as little as 45 lb. Of hazardous waste in any month, and require registration and controls on underground tanks used for storing oil and hazardous waste.

9.4.5 Toxic substances Control Act, Public Law 94-469, As Amended

This Act requires Federal Agencies to properly manage the use and disposal of all toxic substances and specifically requires such management of Polychlorinated Biphenyls (PCB) and substances that contain PCB.

9.4.6 Executive order 12088

Executive Order 12088, Federal Compliance with Pollution Control Standard, October 13,1978 outlines the policies that are to govern compliance with Federal, State, and local environmental standards by Federal Facilities. The head of each executive agency is responsible to ensure that Federal Facilities are at all times designed, constructed, operated and maintained in compliance with all Federal, Stat, and local environmental regulations. The Executive Order further requires that a plan be sent annually to the Office of Management and Budget (OMB) to provide for improvements necessary to meet applicable standards. Exemptions from applicable standards may be granted by the President.

9.4.7 42 U.S. C. 9601, Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, As Amended.

This Act requires reporting of hazardous substance release and previous disposal actions.

9.4.8 Army Regulation 22-1, Environmental Protection and Enhancement

This Regulation provides specific requirements for storage of hazardous materials and compliance with local waste management and pollution abatement programs.

9.5 ENVIRONMENTAL ASSESSMENT

a. A Draft Environmental Assessment (EA) dated July 2002 is included as Attachment D to this RFP Package. The Contractor is instructed to disregard any hand-written notations within the attached Draft EA. In consideration that the finalized and approved EA is not yet available, the Contractor shall make allowance in their schedule and proposal for the 95% design phase so the EA can be submitted for approval and public comment. The Contractor shall allow a minimum 90-day window-time-frame for the EA to be reviewed. Pending the outcome and feedback from the EA review, the Contractor shall make any and all necessary changes in the 95% and subsequent designs, Environmental Work Plan(s), SSHP, Work Schedule, and work effort to comply with the finalized and approved EA. When the updated and finalized copy of the EA is approved, the Contractor may obtain a copy through the COR.

b. In accordance with the guidelines from the Council of Environmental Quality (CEQ) for implementing the National Environmental Policy Act (NEPA) on the proposed construction of the new ERDLF, the following principal environmental categories were examined:

- Environmental Policy
- Endangered and Threatened Species and Critical Habitat
- Wildlife Conservation
- Heritage Conservation
- State, Area-Wide and Local Plan and Program Consistency
- Coastal Management Program Consistency
- Floodplains
- Wetlands
- Socioeconomic Impact
- Farmlands
- Recreation Resources
- Energy Supplies and Natural Resources
- Permits for Navigable Water, Discharge and ROW on Public Lands
- Clean Air and Water Acts
- Pollution Control

These categories were reviewed and consultation with agencies responsible for select functional areas was part of the review process, and categories that were not applicable were dropped from further consideration.

FINDINGS: NO SIGNIFICANT IMPACT IS ANTICIPATED IF THIS PROJECT IS TO BE COMPLETED.

In development of the Environmental Work Plan by the Contractor, all the above categories, but not only limited to the above, shall be considered and addressed. Additionally, the Environmental Pollution Prevention, Underground and Aboveground

Storage Tanks (UST/AST), Emergency Spill and Response Action, Wetlands & Stream Encroachment, and Soil Management, shall be considered and addressed.

9.6 SOIL MANAGEMENT PLAN

a. A Project Specific Soil Management Plan (SMP) shall be developed for this project. The SMP and all required documentation shall be prepared, and all construction and soil-related activities shall be performed, in accordance with the Standing Operating Procedure for Soil Management Procedures During Construction Activities (Soil SOP) provided as Attachment M to this RFP, exclusive of Sections 4.0, 4.1, 5.0, and 5.1 of the Soil SOP. The Contractor shall be responsible for all tasks and responsibilities assigned to the Site Construction Manager or Site Construction Project Manager as provided in the Soil SOP. The Offeror shall fully consider the content and requirements of the Soil SOP during bid preparation. The SMP and related activities are separate from and should not be confused with the UXO clearance activities previously discussed in this PART. The SMP shall address, but not only limited to, issues related to the procedures utilized in the: handling, storage, protection, transportation, equipment, stockpiling, documenting, sampling and testing, manifesting, supervision, safety measure/precautions, and regulatory compliance in the methods and techniques the Contractor will use. The Contractor shall coordinate with the COR when excavating soil/earth/rock and construction material. The COR in concert with the EAO will provide direction and guidance as to location of where material shall be stockpiled and temporarily stored. The Contractor is required to sample and analyze all excess soil and visually contaminated soil piles and characterize them to make a determination as to whether it qualifies for re-use within ARDEC or must be treated/disposed as a hazardous waste. Excess soil determined to be non-hazardous shall be segregated, stockpiled, and not co-mingled with any hazardous soil or any clean uncontaminated material.

b. Excess soils are only soils that are leftover (extra) and that are not placed back into its original location of origin. Therefore, if soil is placed back into its original location of origin, it need not be sampled prior to being placed back into its original location. Any soils that are not used at the project site are considered excess soil and must be characterized (sampled) to determine if it can be stockpiled in ARDEC’s Soil Excess Area, or must be transported and manifested off the ARDEC for proper treatment and disposal.

c. ARDEC has within its Installation Soil Excess Areas. After excavated materials have been properly characterized and tested, the Contractor shall be responsible in documenting (tracking), manifesting and transporting the excavated material to a designated Soil Excess Area within ARDEC. The travel distance to the Soil Excess Area is within three miles from the work site. The COR will identify and designate the Soil Excess Area during construction. The manifest (ARDEC’s Manifest) will be signed by the COR and the Contractor.

d. The following are general requirements and minimum procedures, including summary and excerpts from the attached Soil SOP for the Contractor's convenience, that the Contractor must comply with in any project activity related to demolition and (or) construction including, but not only limited to, site preparation and restoration, grading, and installation of new surface and subsurface utilities, that will generate excess or visually contaminated soil:

1. The Contractor shall not mix or commingle suspected or known contaminated material and soil with those that are non-contaminated.
2. The Contractor shall segregate and not mix or commingle soils with rock, boulders, concrete, demolition and construction debris.
3. ARDEC Personnel will obtain and pay for all subsurface samples that they may collect and obtain from excavated soil pits. However, the Contractor shall pay for all Excess Soil Pile Sampling (labor, laboratory, analytical, and all associated costs).
4. Soil which is visually contaminated: Any soil generated during the project shall be visually screened for the presence of obvious contamination. If the material appears to be contaminated, it shall be properly stockpiled and characterized for future removal and transport. The licensed Contractor shall manifest and transport soils, which re tested and characterized hazardous per subparagraph 6 below, to an EPA approved offsite facility for treatment or disposal per subparagraph 7 below.
5. Soil Which Does Not Appear to be Visually Contaminated: Any soil which does not appear visually contaminated can be re-used for backfilling or grading purposes as long as long as the material is returned to the position of it's original location. However, It is herby emphasized to the Contractor that large-scale re-grading is unacceptable at CERCLA designated sites, which will require future soil remediation. If re-grading is necessary for a building within a CERCLA site, the EAO must be notified through the COR, and approval (in writing) shall be obtained by the Contractor prior to re-grading.
6. Soil Stockpiling and Characterization: Visually contaminated soil and excess soil, which cannot be re-used at the project location, must be properly stockpiled on site and characterized for classification. Soil stockpiles shall be placed on and properly secured and covered with minimum 10-mil plastic sheeting. The Contractor shall pay for the sampling characterization (all direct cost and associated cost) of all excavated excess soil piles (see below). The results shall be neatly collated and submitted in a bounded or three-ring binder to the COR and EAO for review. The referenced characterization sampling should be completed in

accordance with New Jersey Department of Environmental Protection (NJDEP) protocols outlined in NJDEP's Technical Requirements for Site Remediation 7:26E-6.4 "Post-remedial Action Requirements". Soil samples are to be collected at a frequency of one sample per 20 cubic yards for the first 100 cubic yards followed by one sample for each additional 100 cubic yards thereafter. Samples should be analyzed for

a) TAL Metals by USEPA SW0846 Method 6020
b) Semi-Volatile Organic Compounds by USEPA SW-846, Method 7270B
c) Explosives by USEPA SW-846, Method 8330

7. Soil Tracking and Manifesting: Excess Soils characterized as non-hazardous (ID 27) industrial waste as defined in Section 3.1 of the attached Soil SOP, shall be transported by the Contractor to the Installation's on-site designated soil re-use area (within three miles travel distance from the work site) and properly stockpiled. Excess soil identified for removal and transportation to a designated on-site storage area must be tracked utilizing the ARDEC's Soil Management Manifest and Record document. Soil piles from each building or excavation area shall remain segregated to ensure proper tracking and manifesting. A copy of the required manifest form is included in the attached Soil SOP or can be obtained from the EAO. Excess soil and visually contaminated soil determined to exceed the non-hazardous ID-27 designation shall be tracked and manifested, transported, and disposed of as hazardous waste at an EPA-approved Transportation, Storage and Disposal (TSD) facility located off the Installation. The Contractor shall submit all required soils and analytical test data and proposed TSD facility(s) information for EPA approval through the COR and EAO. Up to 4 weeks shall be allowed for EPA approval/response. Completed records must be forwarded to the EAO through the COR.

9.7 BACKGROUND INFORMATION OF SITE:

This project site is designated as a Category II Site in accordance with Army Regulation AR 415-15. Most of this project is located within designated sites covered by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). As a result, portions of the project site have been investigated as part of an ongoing CERCLA site groundwater characterization effort, which has yielded contamination data for each Area of Concern (AOC). Designated CERCLA sites with potentially affected AOCs include Sites #55, #62, #100, #127, #130, and #151. This information is retained by the PDREC EAO and is available through the COR for Offeror review and copying at their expense. Attachment V to this RFP package contains selected excerpted tables, figures, and text from the November 2003 Picatinny Arsenal Phase II Remedial Investigation Report, Volume 2 – Area H Sites, and is provided for the Offerors' convenience. Offerors shall be responsible for carefully studying <u>all available data</u> and their

potential impact to the project design and construction prior to preparing their formal proposals.

END OF PART 9

PART 10 EXPLOSIVE SAFETY DESIGN

10.1 EXPLOSIVES SAFETY DESIGN

All explosive safety design shall meet the requirements given in AR 385-64, DA Pam 385-64 and AMC-R 385-100. AR 385-64, U.S. Army Explosives Safety Program and DA PAM 385-64, Ammunition and Explosives Safety Standards (AR/DA PAM 385-64) implement Department of Defense (DOD) ammunition and explosives safety standards (DoD 6055.9-STD). AMC-R 385-100 prescribes additional industrial and explosives safety standards for AMC operations and facilities. In cases where there is a conflict between standards, the more restrictive standard shall apply. See AR 385-10, The Army Safety Program for additional guidance regarding conflicts in standards.

10.2 DESIGN OF BLAST RESISTANT BUILDING COMPONENTS

All structural building assemblies and components requiring blast resistant performance properties shall be prepared and designed by a licensed structural engineer having a minimum of five years experience designing structures capable of resisting dynamic pressure and impulse loads equivalent or greater than the blast pressure and impulse loads identified for this project. Experienced in all building components requiring design for blast effects shall be designed and detailed in accordance with the requirements given in Army TM 5-1300 "Structures to Resist the Effect of Accidental Explosions". All newly constructed walls designated, as bay dividing walls shall as a minimum meet the requirements given in 10.3 below.

10.3 SUBSTANTIAL DIVIDING WALL (SDW) REQUIREMENTS

SDW is a reinforced concrete wall surrounding areas were high energetic material is stored, tested, handled and/or processed. SDW shall have the following minimum characteristics:

(1) Minimum thickness of 12 inches reinforced concrete,
(2) Steel reinforcing bars (rebar) on both faces of the wall,
(3) minimum #4 (1/2-inch in diameter) vertical and horizontal rebar,
(4) Vertical and horizontal rebar spaced not more than 12 inches apart,
(5) Position of bars on one face staggered with the bars on the opposite face,
(6) Two inches of concrete cover over the reinforcing bars, and
(7) Minimum concrete compressive strength of 4000 pounds per square inch (psi).
(8) Walls shall not contain any openings. Penetrations for pipes may be installed but shall be mounted and secured into the structure to prevent weakening the pressure containment capability of the dividing walls.

(Note: The main steel shall be continuous into supports. The SDW shall be supported at the floor and at any adjacent SDW.)

10.4 UNINTENTIONAL INITIATION OF EXPLOSIVES

All structural members shall be designed and detailed in accordance with the requirements given in Army TM 5-1300 "Structures to Resist the Effect of Accidental Explosions".

Any room(s) in the facility involving the machining or processing of explosives, shall be designed to vent the explosive effects without simultaneous detonation by blast wave and/or by airborne fragments to other rooms.

The use of Substantial Dividing Walls (SDW) is not prohibited when they provide required level of protection in accordance with the Site Safety Plan, DoD 6055.9-STD, TM 5-1300 or all other applicable references

If a reinforced concrete roof slab is used as the containment solution to meet the Site Safety Plan, DoD 6055.9-STD, TM 5-1300 or any other applicable requirement, it may be integrated into the main building structure or be separate from the main building roofing assembly.

Air blast loads to be used for this design shall be computed using a method that accurately predicts the air blast environment from internal explosions. Predictions shall account for multiple shock wave reflections with gas pressure buildup and venting.

10.5 HIGH ENERGETIC MATERIAL

The energetic material used in this facility is classified as Class 1, Hazard Division 1 explosives (HD 1.1).

The total weight of high energetic material in a single bay shall conform to the requirements of the operational procedure given in the Room By Room description, see Attachment A. Where explosive weights are given or referenced in this RFP, they shall be equal to the listed weight in TNT or the equivalent explosive weight of alternative energetic materials.

The Room-By-Room descriptions state the allowable maximum explosive weight limits for the individual functional areas. In the storage magazine a maximum of 425lbs TNT, or equivalent HD 1.1 explosives will be stored in each of the four storage bays at any given time.

END OF PART 10

PART 11 SPECIFICATIONS

11.1 FULLY DEVELOPED SPECIFICAITONS

The following specifications in this RFP have been fully developed to be included as part of the construction contract. No further editing is required although some sections may require information to be inserted by the Contractor. The Contractor shall include all of these specifications in his final construction documents.

00800 Special Contract Requirements
01010 Design Requirements
01012 Design After Award
01090 Sources for Reference Publications
01310 Project Schedule: Network Analysis System
01312 Quality Control System (QCS)
01330 Submittal Procedures Design-Build Construction (The Contractor shall include in this section, for his design submittal, a complete list of submittal register Form 4288.)
01420 Safety
01451 Contractor Quality Control Design-Build Construction
01452 Testing for Mechanical and Electrical Systems
01453 Contractor Warranty Management

11.2 CONTRACTOR-DEVELOPED SPECIFICATIONS

The following is a list of specifications to be developed by the Contractor for this design/build submission. The Contractor is not restricted from providing more specifications for this submission. Guide specifications from the Unified Facilities Guide Specifications (UFGS) shall be used http://www.hnd.usace.army.mil/techinfo/gspec.htm. Specifications from other sources will be used only when UFGS guide specifications are not available.

11.2.1 Civil and Landscaping

01356A STORM WATER POLLUTION PREVENTION MEASURES
02220A DEMOLITION
02230A CLEARING AND GRUBBING
02315A EXCAVATION, FILLING AND BACKFILLING FOR BUILDINGS
02316A EXCAVATION, TRENCHING AND BACKFILLING FOR UTILITIES SYSTEMS
02370A SOIL SURFACE EROSION CONTROL
02510A WATER DISTRIBUTION SYSTEM
02531A SANITARY SEWERS
02630A STORM-DRAINAGE SYSTEM
02763A PAVEMENT MARKINGS
02921A SEEDING
02930A EXTERIOR PLANTING

11.2.2 Geotechnical

02300 EARTHWORK
02315A EXCAVATION, FILLING AND BACKFILLING FOR BUILDINGS
02713A BITUMINOUS BASE COURSE
02721A SUBBASE COURSE
02741A HOT-MIX ASPHALT (MHMA) FOR ROADS
02748A BITUMINOUS TACK AND PRIME COATS
02754A CONCRETE PAVEMENT FOR SMALL PROJECTS
02770A CONCRETE SIDEWALKS AND CURBS AND GUTTERS
02966A HOT IN-PLACE RECYCLING OF BITUMINOUS PAVEMENTS
NJDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION

11.2.3 Architectural

DIVISION 06 - WOOD AND PLASTICS

06100 ROUGH CARPENTRY
06200 FINISH CARPENTRY
06410 LAMINATE CLAD ARCHITECTURAL CASEWORK
06650 SOLID POLYMER (SOLID SURFACING) FABRICATIONS

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

07110 BITUMINOUS DAMPPROOFING
07132 BITUMINOUS WATERPROOFING
07212 MINERAL FIBER BLANKET INSULATION
07214 BOARD AND BLOCK INSULATION
07220 ROOF AND DECK INSULATION
07240 EXTERIOR INSULATION AND FINISH SYSTEMS
07416 STRUCTURAL STANDING SEAM METAL ROOF (SSSMR) SYSTEM
07530 ETHYLENE PROPYLENE DIENE MONOMER (EPDM) ROOF MEMBRANE
07600 FLASHING AND SHEET METAL
07612 ALUMINUM STANDING SEAM ROOFING
07620 MESH TERMITE BARRIER
07625 COPPER SHEET METAL FLASHING
07840 FIRESTOPPING
07920 JOINT SEALANTS

DIVISION 08 - DOORS AND WINDOWS

08110 STEEL DOORS AND FRAMES
08120 ALUMINUM DOORS AND FRAMES
08210 WOOD DOORS
08302 CORROSION CONTROL HANGAR DOORS
08315 BLAST RESISTANT DOORS (OVAL ARCH MAGAZINES)
08330 OVERHEAD ROLLING DOORS
08331 METAL ROLLING COUNTER DOORS
08390 BLAST RESISTANT DOORS
08510 STEEL WINDOWS
08520 ALUMINUM WINDOWS
08581 BLAST RESISTANT TEMPERED GLASS WINDOWS
08710 DOOR HARDWARE
08800 GLAZING
08900 GLAZED CURTAIN WALL

DIVISION 09 – FINISHES

09200 LATHING AND PLASTERING
09205 FURRING AND LATHING
09210 GYPSUM PLASTER
09250 GYPSUM BOARD
09310 CERAMIC TILE, QUARRY TILE, AND PAVER TILE
09510 ACOUSTICAL CEILINGS
09650 RESILIENT FLOORING
09965 METALLIC TYPE CONDUCTIVE/SPARK RESISTANT CONCRETE FLOOR FINISH
09660 CONDUCTIVE VINYL FLOORING
09680 USACE 11/03 CARPET
09720 USACE 11/03 WALLCOVERINGS
09900 PAINTS AND COATINGS
09915 COLOR SCHEDULE

DIVISION 10 - SPECIALTIES

10153 TOILET PARTITIONS
10260 WALL AND CORNER GUARDS
10430 EXTERIOR SIGNAGE
10440 INTERIOR SIGNAGE
10800 TOILET ACCESSORIES

DIVISION 11 - EQUIPMENT

11161 DOCK LEVELERS

DIVISION 12 - FURNISHINGS

12490 WINDOW TREATMENT
12490 BLINDS, VENETIAN (AND AUDIO VISUAL)

11.2.4 Structural

03100A STRUCTURAL CONCRETE FORMWORK
03101A FORMWORK FOR CONCRETE
03150A EXPANSION JOINTS, CONTRACTION JOINTS, AND WATERSTOPS
03200A CONCRETE REINFORCEMENT
03300 CAST-IN-PLACE STRUCTURAL CONCRETE
03330A CAST-IN-PLACE ARCHITECTURAL CONCRETE
03340 ROOF DECKING, CAST-IN-PLACE LOW DENSITY CONCRETE
03413A PRECAST ARCHITECTURAL CONCRETE
03450 PLANT-PRECAST ARCHITECTURAL CONCRETE
04200 MASONRY
04810 NONBEARING MASONRY VENEER/STEEL STUD WALLS
05090A WELDING, STRUCTURAL
05120 STRUCTURAL STEEL
05210A STEEL JOIST
05310 STEEL DECKS
05400 COLD-FORMED METAL FRAMING
05500A MISCELLANEOUS METAL
09965N METALLIC TYPE CONDUCTIVE/SPARK RESISTANCE CONCRETE FLOOR FINISH
13080 SEISMIC PROTECTION FOR MISCELLANEOUS EQUIPMENT
13120 PREENGINEERED METAL BUILDINGS
13121 METAL BUILDING SYSTEMS (MINOR REQUIREMENTS)
13420A SELF-ACTING BLAST VALVES

14630A OVERHEAD ELECTRIC CRANE
15070A SEISMIC PROTECTION FOR MECHANICAL EQUIPMENT
16070A SEISMIC PROTECTION FOR ELECTRICAL EQUIPMENT

11.2.5 Mechanical

02554A ABOVEGROUND HEAT DISTRIBUTION SYSTEM
13080 SEISMIC PROTECTION FOR MISCELLANEOUS EQUIPMENT
13851A FIRE DETECTION AND ALARM SYSTEM, ADDRESSABLE
13920N FIRE PUMPS
13930A WET PIPE SPRINKLER SYSTEM, FIRE PROTECTION
13945A PREACTION AND DELUGE SPRINKLER SYSTEMS, FIRE PROTECTION
15070A SEISMIC PROTECTION FOR MECHANICAL EQUIPMENT
15080A THERMAL INSULATION FOR MECHANICAL SYSTEMS
15400A PLUMBING, GENERAL PURPOSE
15211N LOW PRESSURE COMPRESSED AIR PIPING (NON-BREATHING AIR TYPE)
15569A WATER AND STEAM HEATING; GAS FIRED; UP TO 20 MBTUH
15620A LIQUID CHILLERS
15720N AIR HANDLING UNITS
15895A AIR DISTRIBUTION, VENTILATION AND EXHAUST SYSTEMS
15951A DIRECT DIGITAL CONTROLS FOR HVAC
15990A TESTING, ADJUSTING AND BALANCING OF HVAC SYSTEMS
15995A COMMISSIONING OF HVAC SYSTEMS

11.2.6 Electrical

13100A LIGHTNING PROTECTION SYSTEM
13850A FIRE DETECTION AND ALARM SYSTEM, DIRECT CURRENT LOOP
16070A SEISMIC PROTECTION FOR ELECTRICAL EQUIPMENT
16264A DIESEL GENERATOR SET, 15-300KW, STANDBY APPLICATIONS
16370A ELECTRICAL DISTRIBUTION SYSTEM, AERIAL
16375A ELECTRICAL DISTRIBUTION SYSTEM, UNDERGROUND
16403A MOTOR CONTROL CENTERS, SWITCHBOARDS AND PANELBOARDS
16410A AUTOMATIC TRANSFER SWITCH AND BY-PASS/ISOLATION SWITCH
16415A ELECTRICAL WORK, INTERIOR
16528A EXTERIOR LIGHTING INCLUDING SECURITY AND CCTV APPLICATIONS
16665A STATIC ELECTRICITY PROTECTION SYSTEM

11.2.7 TELECOMMUNICATIONS

16710A PREMISES DISTRIBUTION SYSTEM
16711A TELEPHONE SYSTEM, OUTSIDE PLANT
16770A PUBLIC ADDRESS SYSTEM

11.2.8 ENVIRONMENTAL

01355 ENVIRONMENTAL PROTECTION

SECTION 01012
DESIGN AFTER AWARD

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

1.1.1 Compliance and Certification

Contractor shall certify that all items submitted in the design documents (after contract award) comply with all the stated RFP requirements. The criteria specified in this RFP are binding contract criteria. In case of any conflict between the RFP criteria and Contractor's submittals, the RFP criteria will govern unless there is a written and signed agreement between Contracting Officer and Contractor waiving a specific requirement.

1.1.2 Contractor's Role During Process

The Contractor's construction management key personnel shall be actively involved during the design process to effectively integrate the design and construction requirements of this contract. In addition to the typical required construction activities, the Contractor's involvement includes, but is not limited to, action such as:
a. Integrating the design schedule into the Master Schedule to maximize the effectiveness of design and construction (within the limits allowed in the contract).
b. Ensuring constructability and economy of the design.
c. Integrating the shop drawing and installation drawing process into the design.
d. Executing the material and equipment acquisition programs to meet critical schedules.
e. Effectively interfacing the construction QC program with the design QC program.
f. Maintaining and providing the design team with accurate, up-to-date redline and as-built documentation.

1.1.3 Order of Design Criteria Procedures

Section 01010 is intended to identify specific design requirements. In cases of criteria conflict, Section 01010 holds precedence over all other criteria mentioned or referenced herein. Specifications define minimum material quality requirements for material and installation.

1.1.3.1 Field Verification

1.1.3.2 Topographical Information

The Contractor shall verify field conditions which are required for final design. The information shall be reflected in the design documents. Government has supplied available topographic and existing utility information for the project. Any additional topographic or utility information required for design after award of the contract shall be provided by Contractor.

1.2 DESIGNER OF RECORD

The Contractor shall identify the Designer of Record for each area of work. One Designer of Record may be responsible for more than one area. All areas of design disciplines shall be accounted for by a listed New Jersey State Registered Architect or Licensed Engineer of Record. The Designer(s)of Record shall stamp, sign, and date all design drawings under their responsible discipline at each design submittal stage.

1.3 STAGES OF DESIGN SUBMITTALS

Design submittals are required at the preliminary (30%) and intermediate (60%) design stages and at the final (95%) design stage. The requirements of each design stage are listed hereinafter. The Contractor shall reflect the number and contents of the design submittals in the progress chart. The 30%, 60%, 95% complete design submittals shall be made in one package each.

1.3.1 Review Submittal (30%)

The review of this submittal is primarily to insure that the contract documents and design analysis are proceeding in a timely manner and that the design criteria is being correctly interpreted. The submittal shall consist of the following:

1. Design analysis, in support of the submitted documents.
2. 30% complete drawings which at a minimum include schematic design level of detail for all work and spatial relationships of ERDLF complex buildings on site provided.
3. Outline specifications on all items of work.

1.3.2 Review Submittal (60%)

The review of this submittal is primarily to insure that the contract documents are proceeding in a timely manner and that the design criteria and 30% review comments are being correctly included. The submittal shall consist of the following:

1. Design analysis, in support of the submitted documents.
2. 60% complete drawings.
3. Draft specifications on all items of work.
4. All permit applications which are to be submitted shall be identified and listed by their anticipated and/or ‘need’ dates and shall include their corresponding governing agency's' address, and point of contact.
5. Annotated 30% comments.

1.3.3 Final Design Review Submittal (95%)

The review of this submittal is to insure that the design is in accordance with the Contractor's proposal and the Contract during the design process. The Contractor shall submit the following documents for Final Design Review:

1. Complete design analysis
2. Complete drawings
3. Updated draft specifications from 60% submittal

4. Copies of current (draft or Final) environmental plans, approved permits, and written documentation of contacts with non-PRDEC agencies associated or in connection with obtaining and filing for environmental permits.

1.3.3.1 Design Analysis

The Design Analysis submitted for Final Design Review (95%) shall be in its final form. The Design Analysis shall include all backup material previously submitted and revised as necessary. All Design calculations shall be included. The Design Analysis shall contain all explanatory material giving the design rationale for any design decisions which would not be obvious to an engineer reviewing the Final Drawings and Specifications.

1.3.3.2 Contract Drawings

The Contract Drawings submitted for Final Design Review (95%) shall include the drawings previously submitted which have been revised and completed as necessary. The Contractor is expected to have completed all of his coordination checks and have the drawings in a design complete condition. The drawings shall be complete at this time including the incorporation of any design review comments generated by previous design reviews. The drawings shall contain all the details necessary to assure a clear understanding of the work throughout construction. Shop drawings will not be considered as design drawings. All design shall be shown on design drawings prior to submittal of shop drawings.

1.3.3.3 Updated Draft Specifications

The updated draft specifications shall red-line changes indicating incorporation of comments from the 60% submittal.

1.3.4 Design Complete Submittal

After the Final Design Review (95%), the Contractor shall revise the Contract Documents by incorporating any comments generated during the Final Design Review (95%) and shall prepare final hard copy Contract Specifications. The Contractor shall submit the following documents for the Design Complete Submittal:
1. Design analysis, in final 100% complete form
2. Complete drawings
3. Updated final specifications from 95% submittal
4. Complete final specifications
5. Annotated 95% review comments
6. Copies of approved environmental permits and associated Work Plans if updated since the 95% submittal.

1.3.4.1 Submittal Time

The Contractor shall submit the Design Complete Submittal (100%) not later than 30 calendar days after the Government returns the annotated Final Design Review Submittal (95%)

1.3.4.2 Corrected Final Submittal

If a sufficient number of comments are generated by the Government during the Final Design Submittal (100%), and at the option of the Contracting Officer, the Contractor shall submit corrected drawings, specifications, and DD Form 1354 for compliance check of the accepted review comments of the Final Design Submittal. The Corrected Final Submittal shall be appropriately stamped to describe the submittal package as follows: "For Review Only - Corrected Final Site/Utility" or "For Review Only - Correct Final Facility". Each sheet of the drawings shall be so stamped accordingly.

1.3.4.3 Updated Final and Complete Final Specifications

The updated final specifications shall red-line changes, indicating incorporating changes from the 95% submittal. The complete final specifications shall be a "clean" copy (ready for construction) of the red-lined updated final specifications.

1.4 QUANTITY OF DESIGN SUBMITTALS

General. The documents which the Contractor shall submit to the Government for each submittal are listed and generally described hereinafter. Unless otherwise indicated, the Contractor shall submit thirty (30) copies of each item required to be submitted at the 30%, 60%, and 95% Review Submittal stages. All drawings for review submittals shall be full-size blue lines. At the Design Complete Submittal, the Contractor shall also submit five (5) complete full size sets of drawings, five (5) complete half size sets and two copies of CADD files in MicroStation V.8 format, five (5) sets of the specifications and two (2) copies on floppy disks in Microsoft Word 7.0.

1.5 MAILING OF DESIGN SUBMITTALS

1.5.1 Mailing

Mail all design submittals to the Government during design and construction, using an overnight mailing service. The Government will furnish the Contractor addresses where each copy shall be mailed to after award of contract. The submittals shall be mailed to not more than (4) different addresses.

1.5.2 Transmittal Letter

Each design submittal shall have a transmittal letter accompanying it indicating the date, design percentage, type of submittal, list of items submitted, transmittal number and point of contact with telephone number.

1.6 COORDINATION

1.6.1 Written Records

Prepare a written record of each design site visit, meeting, or conference, either telephonic or personal, and furnish within five (5) working days copies to the Contracting Officer and all parties involved. The written record shall include subject, names of

participants, outline of discussion, and recommendation or conclusions. Number each written record for the particular project under design in consecutive order.

1.6.2 Design Request for Information (RFI) List

Throughout the life of this contract the Contractor shall furnish a biweekly "RFI" list for design related items. This list shall itemize in an orderly fashion design data required by the Contractor to advance the design in a timely manner. Each list shall include a sequence number, description of action item, name of the individual or agency responsible for satisfying the action item and remarks. The list will be maintained on a continuous basis with satisfied action items checked off and new action items added as required. Once a request for information is initiated, that item shall remain on the list until the requested information has been furnished or otherwise resolved. Copies of the list will be mailed to both the Administrative Contracting Officer and the agencies tasked with supplying the information.

1.7 GOVERNMENT REVIEW COMMENTS

1.7.1 Design Schedule

Within 21 days after Notice to Proceed, the Contractor shall submit for approval, a complete design schedule with all submittals and review times indicated in calendar dates. The Contractor shall update this schedule monthly.

1.7.2 Government Review

a. After receipt, the Government will be allowed thirty (30) days to review and comment on the 30% and 60% design submittals and thirty (30) days to review and comment on the 95% design submittal, except as noted below. For each design review submittal, contracting office will furnish the Contractor comments from the various design sections and from other concerned agencies involved in the review process. The review will be for the conformance with the technical requirements of the solicitation and the Successful Offeror's Proposal.

b. During the design review stages, Government review comments on Contractor's design submittals will be posted in DrChecks (http://65.204.17.188/projnet). Contractor's designers will be required to respond to review comments in DrChecks.

c. As an additional Quality Assurance check, the Government will send the 60% design submittal (if acceptable) to the Department of Defense Explosive Safety Board (DDESB) for review. DDESB typically requires 90 days for review and submission of comments. The contractor will be required to address all DDESB comments, and implement any subsequent design revisions.

1.7.3 Disagreement

If the Contractor disagrees technically with any comment or comments and does not intend to comply with the comment, he must clearly outline, with ample justification, the reasons for noncompliance within five (5) days after receipt of these comments in order that his comment can be resolved. The Contractor shall furnish disposition of all comments, in writing, with the next scheduled

submittal. The Contractor is cautioned in that if he believes the action required by a comment exceeds the requirements of this contract, that he should take no action and notify the Contracting office in writing immediately. Review conferences will be held for each design submittal at the Picatinny Research and Development Center (PRDEC). The Contractor shall bring the personnel that developed the design submittal to the review conference. These conferences will take place the week after the review period.

1.7.4 Late Submittal

If a design submittal is over one (1) day late in accordance with the latest design schedule, the Government review period will be extended 7 days. The review conference will be held the week after the new review period. Submittal date revisions must be made in writing at least one (1) week prior to the scheduled submittal.

1.8 DESIGN ANALYSIS

1.8.1 Media and Format

Media and Format. Present the design analysis on 8½ inch by 11-inch paper except that larger sheets may be used when required for graphs or for other special calculation forms. All sheets shall be in reproducible form. The material may be typewritten, handlettered, handwritten, or a combination thereof, provided it is legible. Side margins shall be 1-inch minimum to permit side binding and head-to-head printing. Bottom margins shall be 1-1/4 inches, with page numbers centered 1 inch from the bottom.

1.8.2 Organization

Assign the several parts and sheets of the design analysis a sequential binding number and bind them under a cover indicating the name of the facility and project number, if applicable. The title page shall carry the designation of the submittal being made. The complete design analysis presented for final review with the final drawings and specifications shall carry the designation "FINAL DESIGN ANALYSIS" on the title page.

1.8.3 Design Calculations

Design calculations and narrative are a part of the design analysis. When they are voluminous, bind them separately from the narrative part of the design analysis. Present the design calculations in a clean and legible form incorporating a title page and index for each volume. Furnish a table of contents, which shall be an index of the indices, when there is more than one volume. Identify (and list) the source of the design basis, loading conditions, supplementary sketches, graphs, formulas, and references. Explain all assumptions and conclusions. Calculation sheets shall carry the names or initials of the designer/computer and the checker and the dates of calculations and checking. No portion of the calculations shall be computed and checked by the same person.

1.9 DRAWINGS

1.9.1 Computer-Aided Design and Drafting (CADD)

Prepare all drawings on Computer-Aided Design and Drafting (CADD) so they are well arranged and placed for ready reference and so that they present complete information. Drawings shall be complete, unnecessary work such as duplicate views, notes and lettering, and repetition of details shall not be permitted. Do not show standard details not applicable to the project, and minimize unnecessary wasted space. Do not include details of standard products or items which are adequately covered by specifications on the drawings. Detail the drawings such that conformance with the RFP can be checked and to the extent that shop drawings can be checked. Do not use shop drawings as design drawings. The design drawings shall consist of drawing on an 30" x 42" format. The Contractor shall use standard Corps of Engineers title blocks and borders on all drawings. Submit an index of drawings with each submittal. The Contracting Officer shall furnish the Contractor file, drawing and specification numbers and CADD file names for inclusion in the title blocks of the drawings.

1.9.2 Format

Create all drawings using CADD methods in MicroStation V8 or AutoCAD 2002 format. Save all Design Complete CADD files as MicroStation V8. The Contractor shall use A/E/C CADD Standards Release 2.0 http://tsc.wes.army.mil/products/standards/aec/intro.asp, available at http://tsc.wes.army.mil. When a project is started the designer must contact the New York District Project Engineer, to obtain the project's CADD code. The sheet reference number (e.g., A-3) and the Project Code (e.g., E123) are combined to create the CADD file name (e.g., E123A3) in accordance with the A/E/C CADD Standard naming convention. This shall insure proper naming of files and tracking of the project within the New York District.

Use of the Fonts Section defeats the purpose of using the A/E/C CADD Standards

1.9.3 Verification of CADD Data

The Contractor shall verify CADD files. Verification shall consist of the following:

a. Each drawing shall be brought up in CADD format specified by the Contracting Officer (MicroStation, AutoCAD, etc.). Custom or proprietary menus shall be replaced with the default CADD menu. If the drawing file requires special shapes, fonts, tables, etc. not common to the CADD software, the Contractor shall also submit a list of these items and levels/layers previously unassigned. These files shall be included in the delivery to the Government.

b. All drawing files shall be provided with full drawing displayed and all extraneous information removed outside of the plot boundary. Drawing file size shall be minimized utilizing "COMPRESS" (MicroStation) or "PURGE" (AutoCAD) or other similar command. Drawing entities outside of the sheet boundary (except for plotting snap points) are not desired on the delivery files, and shall be deleted.

c. The Contractor shall verify the structure of CADD files submitted to the Government. CADD files shall be examined for errors

or corruptions in drawing file structure using software expressly designed for such purposes. Such software shall be capable of saving a report on the condition of the files examined. Examples of such utilities producing acceptable results are EDG (for MicroStation) and Audit/Recover (for AutoCAD). The Contractor shall provide magnetic and hard copies of file checking software message files. CADD files will be accepted if their respective file checking message files indicate that no errors were found.

d. CADD drawing files shall be accompanied on the same compact disc with their respective report message files. A message file shall have the same name as the drawing file, except that the suffix shall be MSG. Special shapes, fonts, tables, etc., files shall be included as necessary to generate the drawing file(s).

1.9.4 Deliverables

a. The Contractor shall submit all CADD data electronically (.dgn, .dwg, etc.) on recordable compact disc (CD-R), 650 MB/74 minute, DOS compatible, ISO standard. All CADD data shall be provided in the preferred dgn data format. If conversion of data is required, the Contractor shall assure that the translated data is complete and viewable as in the original CADD format. The contractor shall provide in addition the original format and cal or pdf format.

b. Deliverable media type and data shall be checked by the Contractor for surface errors and computer viruses using a competent virus-checking program. The Contractor shall provide certification that the virus checking has taken place. The name and release date of the virus-checking software shall be furnished to the Government. Virus-checking software shall be the current version, which has detected the latest known viruses at the time of delivery of the diskettes. For Contractors using virus-checking programs that attach validation files to diskettes, such as the VIRUSCAN program from McAfee and Associates, the validation files on the diskettes shall be sufficient proof of virus checking. If analysis of delivery media by the Government finds evidence of virus infection, the media will be returned to the Contractor. The Contractor shall re-submit the media at no cost to the Government.

c. The Contractor shall label each compact disc with standard compact disc labels. Each compact disc shall be labeled with the following information:

* The name of the project;
* The project location;
* The CADD project code (generally first four characters of the file name); and
* The date of the submittal.

d. The Contractor shall furnish CADD shape, font, tables, etc. files necessary for display or editing of drawing files furnished under this contract.

e. Compact discs furnished by the Contractor shall be delivered in hinged, rigid plastic compact disc boxes.

Submit all Design Complete files including drawings and specifications on CD ROM with "Read Me" file. Submit (3) copies of all disks.

1.9.5 English Unit (metric) Scale

All drawings shall be prepared in English inch-pound (I-P) unit scale with metric units in parentheses. The building drawings shall consist of 1/16" = 1'-0" scale minimum floor plans. Draw elevations to a 1/16" = 1'-0" scale and other visual information as required. Draw building wall sections at a minimum of 1:20 scale. Use a minimum scale of 1" = 30' - 0" for the site, grading and drainage, and exterior utility drawings, unless otherwise indicated.

1.10 SPECIFICATIONS

1.10.1 Unified Facilities Guide Specifications

The Contractor shall submit draft, updated draft, updated final and complete final specifications as required in paragraph 1.3 above. The specifications shall be in SPECSINTACT software, available from http://si.ksc.nasa.gov/specsintact and shall use Uniformed Facilities Guide Specifications (UFGS), available from CCB (see http://www.ccb.org/html/home.html). The order of preference or usage of UFGS specification sections is Army "A" designated sections first, then non-specific (no designation) sections, then Navy "N" designated sections, and finally non-UFGS if a UFGS specification is not available. Where UFGS does not offer a specification for a particular feature of work, the Contractor may use the specifications from other agencies or sources, or provide custom-written specifications. Such specifications only may use another software program than SPECSINTACT (Word, Wordperfect). This RFP includes both required specifications in full text, and a minimum list of specifications the Contractor shall incorporate in the design. Edit the specifications for this project and submit in hand marked-up or graphic highlighted (via word processor or specification software) draft version at the 60% submittal stage and typed, updated and red-lined version at the 95% Review submittal stage and design complete stage (See paragraph 1.3.3 for detailed requirements). If the design is based on a specific product, the specification shall consist of the important features of the product. The specification shall be detailed enough, such that another product meeting the specification could be substituted, and it would not adversely impact the project. After incorporation of comments, submit a updated red-lined final design complete specification package and one (1) original hard copy set of the specifications and a copy on floppy disks in ASCII or PDF format via Adobe Acrobat software - see http://www.adobe.com/products/acrobat/). Delete all marked out or red-lined text and type in all inserted text in the final hard copy.

1.10.2 Submittal Register

Develop the submittal requirements for construction during the design phase of the contract, by producing a Contractor Submittal Register during design. Attach the submittal register for the submittal

requirements of the entire project. Prepare the Submittal Register on ENG Form 4288. The Contractor shall be responsible for listing all required submittals necessary to insure the project requirements are complied with. The Register shall identify submittal items such as shop drawing, manufacturer's literature, certificates of compliance, material samples, guarantees, test results, etc. that the Contractor shall submit for review and/or approval action during the life of the construction contract. Proper tagging of SPECSINTACT-prepared specifications allows this form to be generated at printing. If custom written specifications are developed which are not in SPECSINTACT, Eng Form 4288 for those sections must match the SPECSINTACT-generated form. The Contractor shall place all the Submittal Register pages in an appendix to Section 01330 SUBMITTAL PROCEDURES of the final specifications.

1.11 SURVEYING AND MAPPING

1.11.1 Survey Data

Survey Data: A recent (January 2004) site topographic survey has been prepared for the project site. The topographic survey is included in the information drawings provided with the RFP, and is also available in electronic form. The Contractor shall obtain any additional survey data and mapping required, as an extension of the provided mapping.

1.12 CONTENTS OF DESIGN SUBMITTALS

1.12.1 30% Review Submittal

The 30% submittal shall contain, as a minimum, the following:

A. Civil and Landscape
1. Site General overview of site features planned, such as building orientation, utility pads, parking provisions, traffic circulation, walkways interconnecting buildings and new parking areas, security requirements, etc. Rationale for locating major site elements. Set back requirements or specific clearance requirements. Locations of borrow and spoil areas as required.

2. Grading and Drainage
Grading plan for the site with swales, channels, peak flow retardance sumps, inlets and connecting piping; connection of roof drainage to the underground drainage system. Location of points of discharge or connection to existing storm drainage system. Design values to be used in the storm drainage calculations such as storm frequency, surface runoff coefficients.
3. Water Supply and Sanitary Sewage
Definition of design parameters, such as water demand, hydrant locations, sanitary flow, etc.

Results from the water system pressure test

Preliminary plans of exterior water and sanitary systems.

Analysis of demand and flow to be coordinated with Plumbing.

4. Landscaping
Preliminary description of proposed soil conditioning, erosion control, fine grading and soil cover or turf grass planting locations for coordination with subsurface utilities, snow plowing requirements and conformance with guidelines.

5. Permits
The Contractor shall coordinate with, and submit permit applications through, the Contracting Officer’s Representative (COR) and the PRDEC Environmental Affairs Office to obtain the necessary permits. The permit applications shall be in a "READY FOR SIGNATURE" condition when submitted to the PRDEC Environmental Affairs Office. All contacts with state agencies and other regulators not associated with PRDEC shall be documented in writing and furnished to the Corps of Engineers at the 95% submittal.

B. Geotechnical
1. Definition of design parameters, such as ground water level, soil bearing pressure, soil/rock strength parameters.

2. Analyze adequacy of test pit, soil boring, and laboratory testing information furnished by Government and identify need for additional geotechnical investigation if required.

3. Prepare plans for additional subsurface explorations, if needed.

4. Provide pavement design concept for new parking lots and loading dock access roads.

C. Architectural
1. Schematic design plans indicating dimensions, column lines, sections, etc.

2. Exterior elevations indicating materials, finishes, etc.

3. Building sections indicating basic construction systems, materials, floor/ceiling heights, etc.

4. Major interior elevations including the toilet rooms showing materials, major architectural features, equipment, etc.

5. Enlarged toilet room plans.

6. Finish schedule indicating material, finishes, colors and any special interior design features such as soffits, facias, special coatings, etc.

D. Structural Design
1. Live loads to be used for design. Include roof and floor loads: wind loads, lateral earth pressure loads, seismic loads, explosive safety loads for substantial dividing walls and blast control walls, etc, as applicable.

2. Conceptual design and general information for the proposed structural framing.

3. Preparation of preliminary plans, sections, and elevations of the proposed structure to include “pink water” containment vault. These documents will delineate the layout of the building and the scale and relationship of the structural framing elements.

E. Plumbing
1. A detailed description of the plumbing scope

2. Preliminary plans and riser diagrams.

3. Results from the water quality analysis

4. Preliminary sizing of the water softener.

5. Preliminary domestic hot water heater sizing and selection

F. Process Systems
1. A detailed description and preliminary calculations of the Process Steam, Process Water, Vacuum, and Compressed Air systems.

2. Layout and configuration of the process connections in a typical processing room and machining room.

3. Preliminary plans and calculations for the Contaminated wastewater “Pink Water” collection, storage and secondary containment. A detail of a typical trench drain in a processing room and machining room.

G. Fire Suppression System
1. A detailed description of the Fire Protection Scope to include wet pipe sprinkler system and deluge system.

2. Preliminary plans and riser diagrams

3. Results from the NFPA 291 fire flow test

H. Heating Ventilating and Air Conditioning (HVAC)
1. Building energy calculations and life cycle costing analysis for the selected HVAC system.

2. Computerized heating and cooling load calculations.

3. HVAC equipment schedules.

4. HVAC equipment location plans and unit designations, including all shafts and chases required for ductwork & piping, and wall/roof penetrations.

5. Preliminary plans and calculations for the district steam connection to the building.

I. Interior Electrical Systems

1. A narrative of electrical characteristics (phase, voltage, and number of wires) for the electrical systems. Provide a justification for the system chosen (economic or special condition). A life cycle analysis is required on 480Y/277 and 208Y/120 Volt systems 300 kVA and above.

2. A description of the lighting system(s) to be used for all areas.

3. A tabulation showing the following:

a. Room and number.
b. Lighting intensity proposed for each room. (State the basis for selection such as I.E.S., etc.)
c. The basic characteristics of lighting fixtures being provided, such as 2 x 4 fluorescent, explosion proof, etc.
d. The type of wiring system to be used, such as insulated conductors installed in rigid or intermediate metal conduit, insulated conductors installed in electrical metallic tubing, non-metallic sheathed cables, etc.
e. The grounding and lightning protection system.
f. The basic characteristics of panelboards, switchgear, switchboards, and other major pieces of electrical equipment being provided.
g. Antistatic flooring systems.

4. A preliminary power riser or one-line diagram.

5. Panelboards, switchboards, and major electrical equipment located on the floor plans. Schedules for applicable equipment should be provided. The schedules include all pertinent information to fully describe the equipment but need not be entirely finalized.

6. Locations of electrical closets and rooms.

7. A preliminary lighting fixture schedule shall be included on the drawings.

J. Exterior Electrical Systems
1. A narrative clearly describing the electrical distribution system.

2. The electrical characteristics of the power supply from the service point to the main service equipment.

3. The type, voltage rating and connections, and anticipated kVA rating of the transformer provided.

4. The type, voltage rating and connections of the pad-mounted switch provided.

5. The type of conductor to be used and justification for its use.

6. Include a statement describing the criteria used for the exterior design such as primary and secondary voltage drop. Describe the physical characteristics of the underground power lines.

7. A description of all exterior lighting systems included in the design. Describe the basic characteristics of the fixture types, poles and design lighting levels.

8. Preliminary exterior electrical site plan showing switches, transformers, conductors, manholes, and ductbank routing.

9. A description of connecting into the existing medium-voltage circuit.

K. Electronic and Audio Visual Systems
1. Electronic Systems responsibilities include the following: Fire Detection and Alarm System Communications Systems (Voice and Data)

2. Audiovisual systems responsibilities include the following:

Public address systems
Control Systems
CCTV

3. The design analysis shall include all evaluations required to support design decisions and estimates at this stage of design.

4. Provide a descriptive narrative of all electronic systems that are required for project. Show the location of all electronic system panels, etc., on the floor plans. Show the proposed riser diagrams for all systems.

L. Project Score. Project score for sustainable design using the Sustainable Project Rating Tool. Also submit a detailed description of points received for each category.

1.12.2 60% Design Submittal

The 60% Design Submittal shall contain, as a minimum, the following:

A. Civil and Landscape
1. Site
The site plan shall show the layout (and separation distances) of the buildings, vehicular parking areas, service and delivery truck parking and loading areas, connection of new paved areas to existing roadways, pads, industrial wastewater (pinkwater) transfer sump, covered walkways interconnecting new buildings and Building No.225, sidewalks, industrial waste water transfer facility.

2. Grading and Drainage
The grading and drainage plan shall show the finished floor elevations of the buildings, the finished contours, and appropriate spot elevations. The plan should show the storm drainage system with the swales, channels, pipe sizes and invert elevations indicated. The storm drainage calculations should be submitted for review.

3. Site Details
Provide details of drainage swales/ditches, peak flow retardance sumps/depressions, inlets, drainage structures, subdrains, manholes,

valves, valve box settings, fire hydrants, thrust restraint systems for water lines, meter sets, post indicator valve setting, pipe installation/trench details, pavement cross sections, pavement markings, signage, headwalls. Provide profiles of the storm lines.

4. Water Supply and Sanitary Sewage
Utility plans fully coordinated with other disciplines and checked for clearances at all utility crossings. Profiles of the sanitary lines, water supply lines (potable and fire protection) shall be provided. Calculations for the sizing of the water and sanitary lines shall be submitted. Calculations for pressure piping thrust restraint system shall be submitted Include complete specifications for the water and sanitary system.

5. Erosion Control
Provide a soil erosion and sediment control plan and details in accordance with the latest state standards.

6. Landscaping
Soil vegetative cover and turf grass planting plan to be coordinated with site grading and drainage. Provide erosion control measures and specific seed mixtures for each condition.

7. Specifications
Provide draft specifications.

8. Permits
Indicate the permits required and their status along with updates of all written contact documentation as described in paragraph 1.12.1 30% Review Submittal, subparagraph 5 Permits.

B. Geotechnical

1. Geotechnical Design Analysis report including all requirements contained in Section 01010 PART 3 and the following, at a minimum:
   a. Confirmation of final soil/rock conditions including locations and estimated quantities of anticipated rock removal, if any.
   b. Preliminary bearing capacity and settlement analyses, including calculations, of the building foundations.
   c. Groundwater conditions encountered and related recommendations for design (permanent) and construction (temporary).
   d. Construction recommendations including excavation and subgrade preparation for building foundations and pavements.

2. Draft design of building foundations, considering investigation results and preliminary bearing capacity and settlement analyses.
3. Draft geotechnical specifications.
4. Draft pavement and sidewalk section design, including calculations.

C. Architectural

1. Design development plans indicating dimensions, column lines, major detail references, door numbers, window types, etc.
2. Exterior elevations indicating materials, finishes, colors, etc.

3. Building sections indicating construction, materials, etc.
4. Wall sections indicating construction, materials, dimensions, etc.
5. Finish schedules.
6. Door and window schedules.
7. Detail plans including:
    a. Room names.
    b. Door numbers.
    c. Equipment.
    d. Toilet accessories.
    e. Dimensions.
8. Draft architectural specifications.

D. Structural Design

1. Description of the method of providing lateral stability for the structural system to meet seismic and wind load requirements. Include sufficient calculations to verify the adequacy of the method.
2. Calculations for all principal roof, floor and foundation members.
3. Incorporate any changes required by review comments on the 30% design submittal.
4. Drawings showing roof and floor framing plans as applicable. Structural members will be shown on the plans. A foundation plan shall also be furnished showing main footings and grade beams. Where beam, column, and footing schedules are used, show schedules and fill in sufficient items to indicate method to be used. Show typical bar bending diagrams. Typical sections shall be furnished for roof, floor, and foundation conditions.
5. Structural drawings shall be separate from architectural drawings.
6. Computer analyses used shall be widely accepted, commercially available programs, or complete documentation shall be provided.
7. Structural analysis and report indicating material selection, proposed construction and assembly method(s) containing predicted material responses, pressure/impulse values related to the controlling, directional venting and dampening of dynamic air-blast pressure/impulse forces acting against substantial dividing walls, blow-out walls and containment assemblies. Blast design load values shall be determined for the various weights of TNT listed in this RFP and the blast design load values associated with the equivalent weights of alternative explosive material as listed in this RFP.
8. Draft structural specifications.

E. Plumbing

1. Justification and brief description of the types of plumbing fixtures, piping materials and equipment proposed for use.

2. Detailed calculations for domestic hot water, cold water, and sanitary systems including sizing of the domestic hot water heater and piping.

3. Locations and general arrangement of plumbing fixtures and major equipment.

4. Plan and riser diagrams of all areas including hot water, cold water, waste and vent piping.

5. Equipment and fixture schedules with descriptions, capacities, locations, connection sizes and other information as required.

F. Process Systems

1. Detailed Process Steam system equipment and pipe sizing calculations. List of selected equipment.

2. Detailed Process Water system equipment and pipe sizing calculations. List of selected equipment.

3. Detailed Vacuum System equipment and pipe sizing calculations. List of selected equipment.

4. Detailed Compressed Air system equipment and pipe sizing calculations. List of selected equipment.

5. Detailed calculations for the Contaminated wastewater “Pink Water” collection, storage and secondary containment. List of selected equipment.

6. Detailed process system plans and elevations complete with piping, equipment and controls.

7. Detailed system schematics for each process system showing all major components, equipment, valves and sensors.

G. Fire Suppression System

1. List of all references used in the design including Government design documents and industry standards.

2. Classification of each building in accordance with fire zone, building floor areas and height and number of stories.

3. Provide description of required fire protection including extinguishing equipment, detection equipment, alarm equipment and water supply. Alarm and detection equipment shall interface to requirements of Energy Monitoring and Control System (EMCS).

4. Plan and riser diagrams of the sprinkler system and deluge system.

5. Hydraulic calculations for each based on NFPA 291 water flow test for each sprinkler system to insure that flow and pressure requirements can be met with current water supply.

H. Heating Ventilation and Air Conditioning (HVAC)

1. Expanded and updated energy calculations and life cycle costing analysis to be comprehensive with the progression of the design.

2. Expanded and updated computerized heating and cooling load calculations to be comprehensive with the progression of the design.

3. Complete HVAC equipment schedules.

4. HVAC equipment plans and elevations, complete with ductwork, piping, control panels and control devices. Include HVAC legend.

5. Detailed district steam equipment and pipe sizing calculations including the flexibility analysis.

6. Mechanical Room plans and elevations indicating all HVAC equipment, tube pull clearances, piping, ductwork, control panels and devices, dampers, breechings, foundations pads, access doors, maintenance clearances, vents, emergency venting and exhaust systems, drain piping, blowdown piping, access doors, emergency breakglass stations, maintenance platforms and ladders as may be required.

7. HVAC details, complete, including but not limited to details for vibration isolation, seismic restraints and sway bracing, breeching, roof penetrations, and underground concrete trench refrigerant piping supports, and emergency venting and exhaust systems, as required.

8. Direct digital automatic temperature control and energy monitoring control system points schedules. Points schedules shall be complete and fully coordinated with the existing installation remote central DDC EMCS, via telephone modem and portable operator terminal workstation, to provide complete remote central control, monitoring and alarm capability, in addition to local stand-alone DDC monitoring, control and alarm functions.

9. Schematic airflow diagrams for all air handling systems, indicating all duct sizes, dampers, duct flow rates, discharge and intake flow rates.

10. Schematic piping diagrams for all steam, condensate, heating hot water, and refrigerant piping. Schematic piping diagrams shall be complete with all pipe sizes, flow rates, control valves, vacuum breakers, drains and vents, where applicable and as required.

11. Complete DDC controls sequences of operation.

I. Interior Electrical System

1. A narrative describing the electrical distribution system.

2. Floor plans developing the branch circuit wiring design for lighting, power, mechanical, and miscellaneous equipment.

3. Lightning protection and grounding system plan and related details.

4. Switchboard and panel schedules developed to this design level.

5. An upgraded power riser or one-line diagram.

6. Floor plans indicating the major components of the power distribution system, including service switchboard, panelboards, dimming control units, hazardous area equipment, motor starter banks, etc. and the main HVAC equipment.

7. An upgraded lighting fixture schedule.

8. A symbol list.

9. Electrical Specifications.

J. Exterior Electrical System

A site electrical plan indicating the service requirements; connection details for splicing into medium voltage loop; primary feeder routing including manholes; underground branch circuit routing for grade mounted electrical equipment, parking lot lighting; telephone service routing including manholes.

K. Electronic Systems

1. Riser diagrams and details of the low voltage systems: fire alarm, public address, telephone, which have been coordinated with the base requirements.
2. Floor plans indicating the low voltage system services.
3. Complete system construction and point to point writing schematic drawings, including all component values and showing complete letter and number identification of all wire and cable as well as jacks, terminals, and connectors.
4. All panels, plates, and designation strips, including details relating to terminology, engraving, finish, and color.
5. All custom designed consoles, tables, carts, support bases, and shelves.
6. Schematic drawings of all custom components, assemblies, and circuitry.
7. All equipment modifications.
8. Run sheets or field wiring details.
9. Patch panel assignment layout drawing.
10. Front elevation drawings of each equipment rack.
11. All items of equipment whether a stock manufactured item or custom built shall be supported by complete and detailed schematic drawings and replacement parts lists. No "black boxes" or unidentified components shall be acceptable.

L. Project Score.

Project score for sustainable design using the Sustainable Project Rating Tool. Also submit a detailed description of points received for each category.

1.12.3 95% Design Submittal

The 95% Design Submittal shall contain, as a minimum, the following:

1.12.3.1 Permits

Indicate the status of the permits and provide a copy of the approved permits along with the latest version of all related Work Plans. All contacts with state agencies and other regulators not

associated with PRDEC shall be documented in writing and furnished to the Corps of Engineers at the 95% submittal.

1.12.3.2 Landscape, Planting and Turfing

a. Final design drawing(s) shall indicate areas that are to receive vegetative ground cover or turf grass/sod to prevent soil erosion. Scale of drawing shall be prepared at 1"=30'. Drawing shall correspond with the site layout and grading plans and reference coordinates, north arrows, graphic scales and appropriate legends. An overall planting layout shall be developed and shall include enlarged detail plans of specific areas as needed, to clarify requirements. Final design drawings, indicating proposed plants by a (+) mark for the plant location and a circle which is scaled at approximately 2/3 the ultimate growth spread (diameter) of plants. Final drawings shall also include the basic details for installation of tree, shrub, and ground cover planting, as well as any other applicable details for clarification. Plans shall dimension tree locations from pavement edges and distances between trees.

b. Topsoil and soil amendment specifications shall be responsive to existing soil (pH, texture, organic content) as established by soil tests.

1.12.3.3 Civil

Complete site, geometric/dimensional layout, parking and pavement, grading and drainage, utility and sediment and erosion control drawings which have been coordinated with the specifications and the other engineering disciplines. Ensure that the plans are in compliance with the applicable criteria, codes and permits. It will be the Contractor's responsibility to implement the comments generated from any design review submittal as well as verify the consistency between plans (drawings) and specifications. The evaluation of the Contractor's submittals shall be based on the degree to which the submittal meets the requirements set forth in this document and the specifications.

1.12.3.4 Geotechnical

a. Final foundation design of all buildings and structures.
b. Final settlement and bearing capacity analyses and calculations from the final structural loads on the building and structure footings.
c. Final pavement and sidewalk section designs.
d. Final geotechnical specifications for the site work foundations and sidewalks.

1.12.3.4 Architectural

Complete architectural drawings which are coordinated with the other engineering disciplines. Ensure that the plans are in compliance with the applicable codes. It will be the Contractor's responsibility to implement the comments generated from any design review submittal as well as verify the consistency between plans and specification. The evaluation of the Contractor's submittals shall be based on the degree to which the submittal meets the requirements set forth in this document and the specifications.

1.12.3.5 Structural Design

a. Complete checked calculations for all structural members. Incorporate any changes required by comments on 60% Design Submittal.
b. Complete structural drawings coordinated with all other design disciplines.
c. The final structural drawings shall contain the following information as a set of general notes:
-The allowable soil bearing value.
-Frost depth.
-The design stresses of structural materials used.
-The design live loads used in the design of various portions of the structures.
-All crane loads for the building design.
-The design wind speed, exposure, and importance factor.
-The seismic values used in design.
d. All structural drawings and calculations shall be checked. Drawings shall be stamped by the designer of record (a Licensed Professional Engineer in the State of New Jersey).

1.12.3.6 Plumbing

a. All plumbing calculations developed through the 30% and 60% submittals updated, expanded, finalized and completed.
b. All plumbing system drawings completed and finalized.
c. Shop drawings

1.12.3.7 Process Systems

a. All process system calculations developed through the 30% and 60% submittals updated, expanded, finalized and completed.
b. All process system drawings completed and finalized.
c. Shop drawings of all equipment and accessories.

1.12.3.8 Fire Suppression System

a. A file of the input data used in the computer program to design the fire suppression system.
b. Final design drawings and calculations
c. Shop drawings

1.12.3.9 Heating, Ventilation and Air Conditioning (HVAC)

a. All HVAC calculations developed through the 30% and 60% submittals updated, expanded, finalized and completed.
b. All HVAC drawings completed and finalized.
c. Shop drawings of all equipment and accessories as scheduled and as specified, complete with both "point-to-point" and "ladder type schematic" wiring diagrams for power and automatic controls, fully coordinated and combined into a complete coherent system, in accordance with the specified requirements of Section 15951A.

1.12.3.10 Interior Electrical System

a. A coordination study with appropriate curves to show that all protective devices have been fully coordinated. Completed short circuit

calculations for the entire electrical system shall also be provided. All equipment shall be identified by manufacturer's name and catalog number.
b. Complete voltage drop and lighting calculations. The voltage drop calculations shall use the same single line diagram as the short circuit calculations and shall show drops at the same locations as short circuit currents are shown. Lighting calculations (zonal cavity method for interior and point-to-point for exterior) shall be provided for all rooms and spaces and all exterior locations requiring illumination.
c. A completed version of the 60% design narrative submittal reflecting the design as submitted. The aforementioned calculations shall be included with the narrative. The calculations and coordination study shall have the seal of the registered engineer who performed the same affixed to the cover sheet.
d. All details completed. Congested areas which cannot be clearly shown at the drawing scale, shall be shown by expanded scale drawings.
e. Completed drawings thoroughly checked for discipline conflicts to insure that the proper electrical connections are provided for equipment of other disciplines and that there are no conflicts between the location of electrical equipment and equipment of other disciplines.
f. Completed drawings also checked for intra-discipline conflicts.
g. Completed electrical specifications.

1.12.3.11 Exterior Electrical Distribution System

a. A coordination study with appropriate curves to show that ALL protective devices have been fully coordinated. Completed short circuit calculations for the entire electrical system shall also be provided. All equipment shall be identified by manufacturer's name and catalog number.
b. Complete voltage drop and lighting calculations. The voltage drop calculations shall use the same single line diagram as the short circuit calculations and shall show drops at the same locations as short circuit currents are shown. Lighting calculations (zonal cavity method for interior and point-to-point for exterior) shall be provided for all rooms and spaces and all exterior locations requiring illumination.
c. A completed version of the 60% design narrative submittal reflecting the design as submitted. The aforementioned calculations shall be included with the narrative. The calculations and coordination study shall have the seal of the registered engineer who performed the same affixed to the cover sheet.
d. Completed drawings with all comments and any other changes incorporated.
e. All details completed. Congested areas which cannot be clearly shown at the drawing scale, shall be shown by expanded scale drawings.
f. Completed drawings thoroughly checked for discipline conflicts to insure that the proper electrical connections are provided for equipment of other disciplines that there are no conflicts between the location of electrical equipment and equipment of other disciplines.
g. Completed drawings also checked for intra-discipline conflicts.

1.12.3.12 Electronic Systems

Submit completed version of the 60% design drawings indicating low voltage systems, user diagrams, floor plans and details.

1.12.3.13 Project Score.

Project score for sustainable design using the Sustainable Project Rating Tool. Also submit a detailed description of points received for each category.

1.12.4 Design Complete Submittal

Submit complete drawings, specifications, calculations, approved permits with Work Plans if updated since the 95% submittal, and all other materials prepared during design, with New Jersey State Architect/Engineer Professional Seal.

1.13 DD FORM 1354 "TRANSFER AND ACCEPTANCE OF MILITARY REAL PROPERY"

This document is a detailed listing of all real property by category description for the designed facility. It shall be accomplished at the completion of design and furnished with the Final Design Submittal.

1.14 RESIDENT MANAGEMENT SYSTEM (RMS)

The Contractor shall use the Government furnished software module entitled "Resident Management System (RMS)" to create the Submittal Register and the DD Form 1354 during the design phase of this contract. The data generated by the Contractor during the design phase will be used by the Contractor Quality Control Manager in the construction phase of the project. See Section 01312 QUALITY CONTROL SYSTEM (QCS) and Section 01451 CONTRACTOR QUALITY CONTROL for a more detailed description of RMS.

-- End of Section -

SECTION 01090
SOURCES FOR REFERENCE PUBLICATIONS
10/00

PART 1 GENERAL

1.1 REFERENCES

Various publications are referenced in other sections of the specifications to establish requirements for the work. These references are identified in each section by document number, date and title. The document number used in the citation is the number assigned by the sponsoring organization, e.g. ASTM B 564 Nickel Alloy Forgings. However, when the sponsoring organization has not assigned a number to a document, an identifying number has been assigned for reference purposes.

1.2 ORDERING INFORMATION

The addresses of the organizations whose publications are referenced in other sections of these specifications are listed below, and if the source of the publications is different from the address of the sponsoring organization, that information is also provided. Documents listed in the specifications with numbers which were not assigned by the sponsoring organization should be ordered from the source by title rather than by number.

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P.O. Box 9094Farmington Hills, MI 48333-9094
Ph: 248-848-3700
Fax: 248-848-3701
Internet: http://www.aci-int.org

ACOUSTICAL SOCIETY OF AMERICA (ASA)
2 Huntington Quadrangle
Melvile, NY 11747-4502
Ph: 516-576-2360
Fax: 516-576-2377
email: asa@aip.org
Internet: http://asa@aip.org

AGRICULTURAL MARKETING SERVICE (AMS)
Seed Regulatory and Testing Branch
USDA, AMS, LS Div.
Room 209, Bldg. 306, BARC-East
Beltsville, MD 20705-2325
Ph: 301-504-9430
Fax: 301-504-8098
Internet: http://www.ams.usda.gov/lsg
e-mail: james_p_triplitt@usda.gov

AIR CONDITIONING AND REFRIGERATION INSTITUTE (ARI)
4301 North Fairfax Dr., Suite 425

ATTN: Pubs Dept.
Arlington, VA 22203
Ph: 703-524-8800
Fax: 703-528-3816
E-mail: ari@ari.org
Internet: www.ari.org

AIR CONDITIONING CONTRACTORS OF AMERICA (ACCA)
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Washington, DC 20009
Ph: 202-483-9370
FAX: 202-588-1217
Internet: www.acca.org

AIR DIFFUSION COUNCIL (ADC)
104 So. Michigan Ave., No. 1500
Chicago, IL 60603
Ph: 312-201-0101
Fax: 312-201-0214
Internet: www.flexibleduct.org

AIR MOVEMENT AND CONTROL ASSOCIATION (AMCA)
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Arlington Heights, IL 60004-1893
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Ph: 800-231-3475 202-624-5800
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Internet: www.aashto.org

AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS (AATCC)
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Internet: www.aatcc.org

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222 West Las Colinas Blvd., Suite 641
Irving, TX 75039-5423
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Fax: 972-506-7682
Internet: http://www.concrete-pipe.org
e-mail: info@concrete-pipe.org

AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS (ACGIH)
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Cincinnati, OH 45240
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Fax: 513-742-3355
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E-mail: pubs@acgih.org

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Fax: 303-792-0669
Internet: www.aitc-glulam.org

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Washington, DC 20036
Ph: 202-452-7100

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
11 West 42nd St New York, NY 10036 Ph: 212-642-4900 Fax: 212-398-0023
Internet: www.ansi.org/ Note: Documents beginning with the letter "S"
can be ordered from: Acoustical Society of America
P. O. Box 1020Sweickley, PA 15143-9998
Ph: 412-741-1979
Fax: 412-741-0609
Internet: www.asa.aip.org

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Internet: http://www.api.org

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Fax: 614-274-6899
Internet: www.asnt.org

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Ph: 800-248-1946
Fax: 414-272-1734
Internet: http://www.asq.org

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)
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Ph: 610-832-9585
Fax: 610-832-9555
Internet: www.astm.org

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e-mail: marketing@asce.org

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NE Atlanta, GA 30329
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Fax: 404-321-5478
Internet: http://www.ashrae.org

AMERICAN SOCIETY OF SANITARY ENGINEERING FOR PLUMBING AND SANITARY RESEARCH (ASSE)
901 Canterbury, Suite A
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Fax: 440-835-3488
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Internet: www.asse-plumbing.org

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Internet: www.awwa.org

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Aberdeen Roving Ground, MD 21010-5401
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ARMY PAMPHLET (DAPAM)
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Fax: 630-584-2003
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General Services Administration
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e-mail: Customer_Service@cganet.com

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933 N. Plum Grove Rd.
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Fax: 847-517-1206
Internet: www.crsi.org

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Bethesda, Maryland 20814-4408
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Naples, Florida 34109
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Fax: 941-514-3470
Internet: www.cemanet.org

COOLING TOWER INSTITUTE (CTI)
530 Wells Fargo Dr., Suite 218,
Houston, TX 77090
Ph: 281-583-4087

Fax: 281-537-1721
Internet: www.cti.org

COPPER DEVELOPMENT ASSOCIATION (CDA)
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Ph: 508-230-3516 or 800-589-8956
Fax: 508-230-3529
Internet: www.pdionline.org
E-Mail: info@pdionline.org

PLUMBING AND PIPING INDUSTRY COUNCIL (PPIC)
9450 SW Commerce Circle, Suite 310
wilsonville, OR 97070-9626
Ph: 503-682-7919

PORCELAIN ENAMEL INSTITUTE (PEI)
P.O.Box 158541
4004 Hillsboro Pike, Suite 224B
Nashville, TN 37215
Ph: 615-385-5357
Fax: 615-385-5463
Internet: www.porcelainenamel.com
e-mail: penamel@aol.com

PRECAST/PRESTRESSED CONCRETE INSTITUTE (PCI)
209 West Jackson Blvd.
Chicago, IL 60606-6938
Ph: 312-786-0300
Fax: 312-786-0353
Internet: www.pci.org
e-mail: info@pci.org

RUBBER MANUFACTURERS ASSOCIATION (RMA)
1400 K St., NW, Suite 900
Washington, DC 20005
Ph: 202-682-4800
Fax: 202-682-4854
Internet: www.rma.org
Order Publications from:
The Mail Room
P. O. Box 3147 Medina, OH 44258
Ph: 800-325-5095 EXT 242 or 330-723-2978
Fax: 330-725-0576

RURAL UTILITIES SERVICE (RUS)
ATTN: Publications

14th and Independence Ave., SW, Room 4028-S
Washington, DC 20250
Ph: 202-720-8674 OR 202-720-8679
Fax: 202-205-3654
Internet: www.usda.gov/rus

SCREEN MANUFACTURERS ASSOCIATION (SMA)
2850 South Ocean Boulevard, Suite 311
Palm Beach, FL 33480-5535
Ph: 561-533-0991
Fax: 561-533-7466
e-mail: fscottfitzgerald@compuserve.com
Internet: www.eren.doe.gov

SHEET METAL & AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)
4201 Lafayette Center Dr.,
Chantilly, VA 20151-1209
Ph: 703-803-2980
Fax: 703-803-3732
Internet: http://www.smacna.org
e-mail: info@smacna.org

SINGLE PLY ROOFING INSTITUTE (SPRI)
200 Reservoir St., Suite 309A
Needham, MA 02494
Ph: 781-444-0242
Fax: 781-444-6111
Internet: www.spri.org
e-mail: spri@spri.org

SOCIETY OF AUTOMOTIVE ENGINEERS (SAE)
400 Commonwealth Dr.
Warrendale, PA 15096-0001
Ph: 724-776-4841
Fax: 724-776-5760
Internet: http://www.sae.org
e-mail: publications@sae.org

SOUTHERN BUILDING CODE CONGRESS INTERNATIONAL (SBCCI)
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Birmingham, AL 35213-1206
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Fax: 205-591-0775
Internet: www.sbcci.org

SOUTHERN CYPRESS MANUFACTURERS ASSOCIATION (SCMA)
400 Penn Center Boulevard, Suite 530
Pittsburgh, PA 15235
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Fax: 412-829-0844

Internet: www.cypressinfo.org

SOUTHERN PINE INSPECTION BUREAU (SPIB)
4709 Scenic Highway
Pensacola, FL 32504-9094
Ph: 850-434-2611
Fax: 850-433-5594
e-mail: spib@spib.org
Internet: www.spib.org

THE SOCIETY FOR PROTECTIVE COATINGS (SSPC)
40 24th Street, 6th Floor
Pittsburgh, PA 15222-4656
Ph: 412-281-2331
Fax: 412-281-9992
Internet: www.sspc.org
NOTE: SSPC documents, except as noted otherwise, are available only as a part of the 1995 Steel Structures Painting Manual, 7th Edition @ $115.00.

STEEL DECK INSTITUTE (SDI)
P.O. Box 25Fox River Grove, IL 60021-0025
Ph: 847-462-1930
Fax: 847-462-1940
Internet: http://www.sdi.org
e-mail: Steve@sdi.org

STEEL DOOR INSTITUTE (SDOI)
30200 Detroit Rd.
Cleveland, OH 44145-1967
Ph: 440-899-0010
Fax: 440-892-1404
Internet: www.steeldoor.org

STEEL JOIST INSTITUTE (SJI)
3127 Tenth Ave., North Ext.
Myrtle Beach, SC 29577-6760
Ph: 843-626-1995
Fax: 843-626-5565
Internet: www.steeljoist.org

STEEL TANK INSTITUTE (STI)
570 Oakwood Rd.
Lake Zurich, IL 60047
Ph: 847-438-8265
Fax: 847-438-8766
Internet: www.steeltank.com

STEEL WINDOW INSTITUTE (SWI)
1300 Sumner Ave.
Cleveland, OH 44115-2851
Ph: 216-241-7333
Fax: 216-241-0105
Internet: www.steelwindows.com

TILE COUNCIL OF AMERICA (TCA)
100 Clemson Research Blvd
Anderson, SC 29625
Ph: 864-646-8453
FAX: 864-646-2821
Internet: www.tileusa.com
e-mail: literature@tileusa.com

TRUSS PLATE INSTITUTE (TPI)
583 D'Onofrio Dr., Suite 200
Madison, WI 53719
Ph: 608-833-5900
Fax: 608-833-4360

TUBULAR EXCHANGE MANUFACTURERS ASSOCIATION (TEMA)
25 N. Broadway
Tarrytown, NY 10591
Ph: 914-332-0040
Fax: 914-332-1541
Internet: www.tema.org

UNDERWRITERS LABORATORIES (UL)
333 Pfingsten Rd.
Northbrook, IL 60062-2096
Ph: 847-272-8800
Fax: 847-272-8129
Internet: http://www.ul.com/
e-mail: northbrook@us.ul.com

UNI-BELL PVC PIPE ASSOCIATION (UBPPA)
2655 Villa Creek Dr., Suite 155
Dallas, TX 75234
Ph: 214-243-3902
Fax: 214-243-3907
Internet: www.uni-bell.org
e-mail: info@uni-bell.org

U. S. ARMY ENVIORNMENTAL HYGIENE AGENCY (USAEHA)
Waste Disposal Engineering Division
Aberdeen Proving Ground, MD 21010-5422
Ph: 410-436-3652

WATER ENVIRONMENT FEDERATION (WEF)
601 Wythe St.
Alexandria, VA 22314-1994
Ph: 703-684-2452
Fax: 703-684-2492
Internet: www.wef.org

WATER QUALITY ASSOCIATION (WQA)
4151 Naperville Rd.
Lisle, IL 60532
Ph: 630-505-0160
Fax: 630-505-9637
Internet: www.wqa.org
e-mail: info@mail.wqa.org

WEST COAST LUMBER INSPECTION BUREAU (WCLIB)
P.O. Box 23145Portland, OR 97281
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WESTERN WOOD PRESERVERS INSTITUTE (WWPI)
7017 N.E. Highway 99 # 108
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WOOD MOULDING AND MILLWORK PRODUCERS ASSOCIATION (WMMPA)
507 First Street
Woodland, CA 95695
Ph: 916-661-9591
Fax: 916-661-9586
Internet: www.wmmpa.com

-- End of Section -

SECTION 01312

QUALITY CONTROL SYSTEM (QCS)
(NYD VERSION 09/01)

1 GENERAL

The Government will use the Resident Management System for Windows (RMS) to assist in its monitoring and administration of this contract. The Contractor shall use the Government-furnished Construction Contractor Module of RMS, referred to as QCS, to record, maintain, and submit various information throughout the contract period. This joint Government-Contractor use of RMS and QCS will facilitate electronic exchange of information and overall management of the contract. QCS provides the means for the Contractor to input, track, and electronically share information with the Government in the following areas:

Administration
Finances
Quality Control
Submittal Monitoring
Scheduling
Import/Export of Data

1.1 Correspondence and Electronic Communications

For ease and speed of communications, both Government and Contractor will, to the maximum extent feasible, exchange correspondence and other documents in electronic format. Correspondence, pay requests and other documents comprising the official contract record shall also be provided in paper format, with signatures and dates where necessary. Paper documents will govern, in the event of discrepancy with the electronic version.

1.2 Other Factors

Particular attention is directed to Contract Clause, "Schedules for Construction Contracts", Contract Clause, "Payments", Section 01310, PROJECT SCHEDULE: NETWORK ANALYSIS SYSTEM, Section 01330, SUBMITTAL PROCEDURES, and Section 01451A, CONTRACTOR QUALITY CONTROL, which have a direct relationship to the reporting to be accomplished through QCS. Also, there is no separate payment for establishing and maintaining the QCS database; all costs associated therewith shall be included in the contract pricing for the work.

2. QCS SOFTWARE

QCS is a Windows-based program that can be run on a stand-alone personal computer or on a network. The Government will make available the QCS software to the Contractor after award of the construction contract. Prior to the Pre-Construction Conference, the Contractor

shall be responsible to download, install and use the latest version of the QCS software from the Government's RMS Internet Website. Any program updates of QCS will be made available to the Contractor via the Government RMS Website as they become available.

3. SYSTEM REQUIREMENTS

The following listed hardware and software is the minimum system configuration that the Contractor shall have to run QCS:

Hardware
IBM-compatible PC with 200 MHz Pentium or higher processor 64+ MB RAM 4 GB hard drive disk space for sole use by the QCS system 3 1/2 inch high-density floppy drive Compact disk (CD) Reader Color monitor Laser printer compatible with HP LaserJet III or better, with minimum 4 MB installed memory. Connection to the Internet, minimum 28 BPS

Software
MS Windows 95 or newer version operating system (MS Windows NT 4.0 or newer is recommended)
Word Processing software - MS Word 97 or newer

Internet browser
The Contractor's computer system shall be protected by virus protection software that is regularly upgraded with all issued manufacturer's updates throughout the life of the contract.

Electronic mail
(E-mail) compatible with MS Outlook

4. RELATED INFORMATION

4.1 QCS User Guide

After contract award, the Contractor shall download instructions for the installation and use of QCS from the Government RMS Internet Website ("http://winrms.usace.army.mil/);

5. CONTRACT DATABASE

Prior to the pre-construction conference, the Government shall provide the Contractor with basic contract award data to use for QCS. The Government will provide data updates to the Contractor as needed, generally by files attached to E-mail. These updates will generally consist of submittal reviews, correspondence status, QA comments, and other administrative and QA data.

6. DATABASE MAINTENANCE

The Contractor shall establish, maintain, and update data for the

contract in the QCS database throughout the duration of the contract. The Contractor shall establish and maintain the QCS database at the Contractor's site office. Data updates to the Government shall be submitted by E-mail with file attachments, e.g., daily reports, schedule updates, payment requests. If permitted by the Contracting Officer, a data diskette or CD-ROM may be used instead of E-mail (see Paragraph DATA SUBMISSION VIA COMPUTER DISKETTE OR CD-ROM). The QCS database typically shall include current data on the following items:

6.1 Administration

6.1.1 Contractor Information

The database shall contain the Contractor's name, address, telephone numbers, management staff, and other required items. Within 14 calendar days of receipt of QCS software from the Government, the Contractor shall deliver Contractor administrative data in electronic format via E-mail.

6.1.2 Subcontractor Information

The database shall contain the name, trade, address, phone numbers, and other required information for all subcontractors. A subcontractor must be listed separately for each trade to be performed. Each subcontractor/trade shall be assigned a unique Responsibility Code, provided in QCS. Within 14 calendar days of receipt of QCS software from the Government, the Contractor shall deliver subcontractor administrative data in electronic format via E-mail.

6.1.3 Correspondence

All Contractor correspondence to the Government shall be identified with a serial number. Correspondence initiated by the Contractor's site office shall be prefixed with "S". Letters initiated by the Contractor's home (main) office shall be prefixed with "H". Letters shall be numbered starting from 0001. (e.g., H-0001 or S-0001). The Government's letters to the Contractor will be prefixed with "C".

6.1.4 Equipment

The Contractor's QCS database shall contain a current list of equipment planned for use or being used on the jobsite, including the most recent and planned equipment inspection dates.

6.1.5 Management Reporting

QCS includes a number of reports that Contractor management can use to track the status of the project. The value of these reports is reflective of the quality of the data input, and is maintained in the various sections of QCS. Among these reports are: Progress Payment Request worksheet, QA/QC comments, Submittal Register Status, Three-Phase Inspection checklists.

6.2 Finances

6.2.1 Pay Activity Data

The QCS database shall include a list of pay activities that the Contractor shall develop in conjunction with the construction schedule. The sum of all pay activities shall be equal to the total contract amount, including modifications. Pay activities shall be grouped by Contract Line Item Number (CLIN), and the sum of the activities shall equal the amount of each CLIN. CLINs may include multiple activities, but activities may be assigned to only one such CLIN item. The total of all CLINs equals the Contract Amount.

6.2.2 Payment Requests

All progress payment requests shall be prepared using QCS. The Contractor shall complete the payment request worksheet and include it with the payment request. The work completed under the contract, measured as percent or as specific quantities, shall be updated at least monthly. After the update, the Contractor shall generate a payment request report using QCS. The Contractor shall submit the payment requests with supporting data by E-mail with file attachment(s). If permitted by the Contracting Officer, a data diskette may be used instead of E-mail. A signed paper copy of the approved payment request is also required, which shall govern in the event of discrepancy with the electronic version.

6.3 Quality Control (QC)

QCS provides a means to track implementation of the 3-phase QC Control System, prepare daily reports, identify and track deficiencies, document progress of work, and support other contractor QC requirements. The Contractor shall maintain this data on a daily basis. Entered data will automatically output to the QCS generated daily report. The Contractor shall provide the Government a Contractor Quality Control (CQC) Plan within the time required in Section 01451, CONTRACTOR QUALITY CONTROL. Within seven calendar days of Government acceptance, the Contractor shall submit a data diskette or CD-ROM reflecting the information contained in the accepted CQC Plan: schedule, pay activities, features of work, submittal register, QC requirements, and equipment list.

6.3.1 Daily Contractor Quality Control (CQC) Reports.

QCS includes the means to produce the Daily CQC Report. The Contractor may use other formats to record basic QC data. However, the Daily CQC Report generated by QCS shall be the Contractor's official report. Data from any supplemental reports by the Contractor shall be summarized and consolidated onto the QCS-generated Daily CQC Report. Daily CQC Reports shall be submitted as required by Section 01451A, CONTRACTOR QUALITY CONTROL. Reports shall be submitted electronically to the Government using E-mail or diskette within 24 hours after the date covered by the report. Use of either mode of submittal shall be coordinated with the Government representative. The Contractor shall also provide the Government a signed, printed copy of the daily CQC report.

6.3.2 Deficiency Tracking.

The Contractor shall use QCS to track deficiencies. Deficiencies

identified by the Contractor will be numerically tracked using QC punch list items. The Contractor shall maintain a current log of its QC punch list items in the QCS database. The Government will log the deficiencies it has identified using its QA punch list items. The Government's QA punch list items will be included in its export file to the Contractor. The contractor will acknowledge receipt of these QA punch list items by specific number reference on the Daily CQC Report. The Contractor shall regularly update the correction status of both QC and QA punch list items.

6.3.3 Three-Phase Control Meetings

The Contractor shall maintain scheduled and actual dates and times of preparatory and initial control meetings in QCS.

6.3.4 Accident/Safety Tracking.

The Government will issue safety comments, directions, or guidance whenever safety deficiencies are observed. The Government's safety comments will be included in its export file to the Contractor. The Contractor shall regularly update the correction status of the safety comments. In addition, the Contractor shall utilize QCS to advise the Government of any accidents occurring on the jobsite. This brief supplemental entry is not to be considered as a substitute for completion of mandatory reports, e.g., ENG Form 3394 and OSHA Form 200.

6.3.5 Features of Work

The Contractor shall include a complete list of the features of work in the QCS database. A feature of work may be associated with multiple pay activities. However, each pay activity (see subparagraph "Pay Activity Data" of paragraph "Finances") will only be linked to a single feature of work.

6.3.6 QC Requirements

The Contractor shall develop and maintain a complete list of QC Testing, Transfer Property Listings, Installed Property Listings, and User Training requirements in QCS, all tied to individual pay activities. The Contractor shall update all data on these QC requirements as work progresses, and shall promptly provide this information to the Government via QCS.

6.4 Submittal Management

The contractor will initially be required to enter all required submittal information into QCS. Thereafter, the Contractor shall maintain a complete list of all submittals, including completion of all data columns of ENG Form 4288, as required by Section 01330, SUBMITTAL PROCEDURES. Dates on which submittals are received and returned by the Government will be included in its export file to the Contractor. The Contractor shall use QCS to track and transmit all submittals. ENG Form 4025, submittal transmittal form, and the submittal register update, ENG Form 4288, shall be produced using QCS. RMS will be used to update, store and exchange submittal

registers and transmittals, but will not be used for storage of actual submittals.

6.5 Schedule

The Contractor shall develop a construction schedule consisting of pay activities, in accordance with Contract Clause "Schedules for Construction Contracts", or Section 01320A, PROJECT SCHEDULE, as applicable. This schedule shall be input and maintained in the QCS database either manually or by using the Standard Data Exchange Format (SDEF) (see Section 01320A PROJECT SCHEDULE). The contractor shall be responsible for ensuring the SDEF is in the format required to upload the data to QCS; otherwise, the contractor will be required to enter the data manually. The updated schedule data shall be included with each pay request submitted by the Contractor.

6.6 Import/Export of Data

QCS includes the ability to export Contractor data to the Government and to import Government-provided data.

7. IMPLEMENTATION

Contractor use of QCS as described in the preceding paragraphs is mandatory. The Contractor shall ensure that sufficient resources are available to maintain its QCS database, and to provide the Government with regular database updates. QCS shall be an integral part of the Contractor's management of quality control.

8. DATA SUBMISSION VIA COMPUTER DISKETTE OR CD-ROM

The Government-preferred method for Contractor's submission of updates, payment requests, correspondence and other data is by E-mail with file attachment(s). For locations where this is not feasible, the Contracting Officer may permit use of computer diskettes or CD-ROM for data transfer. Data on the disks or CDs shall be exported using the QCS built-in export function. If used, diskettes and CD-ROMs will be submitted in accordance with the following:

8.1 File Medium

The Contractor shall submit required data on 3-1/2 inch double-sided high-density diskettes formatted to hold 1.44 MB of data, capable of running under Microsoft Windows 95 or newer. Alternatively, CD-ROMs may be used. They shall conform to industry standards used in the United States. All data shall be provided in English.

8.2 Disk or CD-ROM Labels

The Contractor shall affix a permanent exterior label to each diskette and CD-ROM submitted. The label shall indicate in English, the QCS file name, full contract number, contract name, project location, data date, name and telephone number of person responsible for the data.

8.3 File Names

The Government will provide the file names to be used by the Contractor with the QCS software.

9. WEEKLY SUBMISSION OF EXPORT FILES

The contractor shall, at a minimum, generate and submit weekly export file to the Gov't.

10. MONTHLY COORDINATION MEETING

The Contractor shall update the QCS database each workday. At least monthly, the Contractor shall generate and submit an export file to the Government with schedule update and progress payment request. As required in Contract Clause "Payments", at least one week prior to submittal, the Contractor shall meet with the Government representative to review the planned progress payment data submission for errors and omissions. The Contractor shall make all required corrections prior to Government acceptance of the export file and progress payment request. Payment requests accompanied by incomplete or incorrect data submittals will be returned. The Government will not process progress payments until an acceptable QCS export file is received.

11. NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the requirements of this specification. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, shall be deemed
sufficient for the purpose of notification. The QCS module shall be completed to the satisfaction of the Contracting Officer prior to any contract payment (except for Bonds, and Insurance, as approved by the Contracting Officer).

-- End of Section -

SECTION 01320A

PROJECT SCHEDULE; NETWORK ANALYSIS SYSTEM

(NYD Rev. 2/03)

PART 1 GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01300 SUBMITTAL PROCEDURES: SD 07 Schedules Initial Project Schedule; GA. Preliminary Project Schedule; GA. Periodic Schedule Updates; GA. Four copies of the schedules showing codes, values, categories, numbers, items, etc., as required. SD-08 Statements Qualifications; FIO. Documentation showing qualifications of personnel preparing schedule reports. SD 09 Reports Narrative Report; FIO. Schedule Reports; FIO.

Four copies of the reports showing numbers, descriptions, dates, float, starts, finishes, durations, sequences, etc., as required.

1.2 QUALIFICATIONS

The Contractor shall designate an authorized representative who shall be responsible for the preparation of all required project schedule reports. This person shall have previously created and reviewed computerized schedules. Qualifications of this individual shall be submitted to the Contracting Officer for review with the Preliminary Project Schedule submission.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 GENERAL

Pursuant to the Contract Clause, SCHEDULE FOR CONSTRUCTION CONTRACTS a Project Schedule as described below shall be prepared. The Contractor shall be responsible for scheduling of all procurement and construction activities as well as design activities if applicable to the project. The scheduling of construction shall be the responsibility of the Contractor. Contractor management personnel shall actively participate in its development. Subcontractors and suppliers working on the project should also contribute in developing and maintaining an accurate Project Schedule. The approved Project Schedule shall be used to measure the progress of the work, to aid in evaluating time extensions, and to provide the basis of all progress payments.

3.2 BASIS FOR PAYMENT

The schedule shall be the basis for measuring Contractor progress. Lack of an approved schedule or scheduling personnel shall result in an inability of the Contracting Officer to evaluate Contractor progress for the purposes of payment. Failure of the Contractor to provide all information, as specified below, shall result in the disapproval of the entire Project Schedule submission and the inability of the Contracting Officer to evaluate Contractor progress for payment purposes. In the case where Project Schedule revisions have been directed by the Contracting Officer and those revisions have not been included in the Project Schedule, then the Contracting Officer may hold retainage up to the maximum allowed by contract, each payment period, until revisions to the Project Schedule have been made.

3.3 PROJECT SCHEDULE

The computer software system utilized by the Contractor to produce the Project Schedule shall be capable of providing all requirements of this specification. Failure of the Contractor to meet the requirements of this specification shall result in the disapproval of the schedule. Manual methods used to produce any required information shall require approval by the Contracting Officer.

3.3.1 Use of the Critical Path Method

The Critical Path Method (CPM) of network calculation shall be used to generate the Project Schedule. The Contractor shall provide the Project Schedule in either the Precedence Diagram Method (PDM) or the Arrow Diagram Method (ADM).

3.3.2 Level of Detail Required

With the exception of the initial and preliminary schedule submission, the Project Schedule shall include an appropriate level of detail. Failure to develop or update the Project Schedule or provide data to the Contracting Officer at the appropriate level of detail, as specified by the Contracting Officer, shall result in the disapproval of the schedule. The Contracting Officer will use, but is not limited to, the following conditions to determine the appropriate level of detail to be used in the Project Schedule.

3.3.2.1 Activity Durations

Contractor submissions shall be required to follow the direction of the Contracting Officer regarding reasonable activity durations. Reasonable durations are those that allow the progress of activities to be accurately determined between payment periods. A rule of thumb, that the Contractor should use, is that less than 2 percent of all non-procurement activities' Original Durations shall be greater than 20 days.

3.3.2.2 Design and Permit Activities

Design and Permit Activities-The Contractor shall integrate design and

permitting activities, including necessary conferences and follow-up actions and design package submission dates into the schedule if these items are applicable to the project.

3.3.2.3 Procurement Activities

Tasks related to the procurement of long lead materials or equipment shall be included as separate activities in the project schedule. Long lead materials and equipment are those materials that have a procurement cycle of over 90 days. Examples of procurement process activities include, but are not limited to: submittals, approvals, procurement, fabrication, delivery, installation, start-up, and testing.

3.3.2.4 Government Activities

Government and other agencies activities that could impact progress shall be shown. These activities include, but are not limited to: approvals, inspections, utility tie-in, Government Furnished Equipment (GFE) and notice to proceed for phasing requirements.

3.3.2.5 Workers Per Day

All activities shall have an estimate of the average number of workers per day that are expected to be used during the execution of the activity to produce the expected completion date. If no workers are required for an activity, in the case of activities related to procurement, for example, then the activity shall be identified as using zero workers per day. The workers per day information for each activity shall be identified by the Workers Per Day Code.

3.3.2.6 Responsibility

All activities shall be identified in the project schedule by the party responsible to perform the work. Responsibility includes, but is not limited to, the subcontracting firm, contractor work force, or government agency performing a given task. Activities shall not belong to more than one responsible party. The responsible party for each activity shall be identified by the Responsibility Code.

3.3.2.7 Work Areas

All activities shall be identified in the project schedule by the work area in which the activity occurs. Activities shall not be allowed to cover more than one work area. The work area of each activity shall be identified by the Work Area Code.

3.3.2.8 Modification or Claim Number

Any activity that is added or changed by contract modification or used to justify claimed time shall be identified by a mod or claim code that changed the activity. Activities shall not belong to more than one modification or claim item. The modification or claim number of each activity shall be identified by the Mod or Claim Number.

3.3.2.9 Bid Item

All activities shall be identified in the project schedule by the Bid Item to which the activity belongs. An activity shall not contain work in more than one bid item. the bid item for each appropriate activity shall be identified by the Bid Item Code.

3.3.2.10 Phase of Work

All activities shall be identified in the project schedule by the phases of work in which the activity occurs. Activities shall not be allowed to contain work in more than one phase of work. The project phase of each activity shall be by the unique Phase of Work Code.

3.3.2.11 Category of Work

Category of Work All Activities shall be identified in the project schedule according to the category of work which best describes the activity. Category of work refers, but is not limited to, the procurement
chain of activities including such items as submittals, approvals, procurement, fabrication, delivery, installation, start-up, and testing. The category of work for each activity shall be identified by the Category of Work Code.

3.3.2.12 Feature of Work

All activities shall be identified in the project schedule according to the feature of work to which the activity belongs. Feature of work refers, but is not limited to a work breakdown structure for the project. The feature of work for each activity shall be identified by the Feature of Work Code.

3.3.2.13 Critical Activities.

In addition to other activities as required to complete the project, the Progress schedule shall include the following as separate line activities:

a. Submission and approval of mechanical/electrical layout drawings.
b. Submission and approval of O & M Manuals.
c. Submission and approval of as-built drawings.
d. Submission and approval of 1354 data and installed equipment lists.
e. Submission and approval of HVAC Testing and Balancing plan.
f. HVAC Testing and Balancing and submission and approval of report.
g. Submission and approval of HVAC Commissioning plan.
h. HVAC Commissioning.
i. Other Systems testing as required.
j. Warranty Action Preparation
k. Pre-final inspection.
l. Correction of punchlist for pre-final inspection.
m. Final inspection.

3.3.2.14 HVAC Testing, Balancing and Commissioning.

If this contract contains requirements for Heating, Ventilation and Air Conditioning Testing and Balancing and Commissioning, these activities must

be allocated sufficient time and personnel resources by the Contractor

so that they can be accomplished within time allowed for project completion. These activities are necessary to assure detection of any deficiencies in the HVAC Systems and avoid warranty callbacks. Included for guidance at the end of this section is a flow chart (Figures 1 and 2) showing major activities and their chronological relationship to each other and to the Notice to Proceed and Contract Completion points. They are for guidance only - the Contractor shall refer to applicable specification sections for actual requirements for these activities.

3.3.3 Scheduled Project Completion

The schedule interval shall extend from notice-to-proceed to the contract completion date.

3.3.3.1 Project Start Date

The schedule shall start no earlier than the date that the Notice to Proceed (NTP) was acknowledged. The Contractor shall include as the first activity in the project schedule an activity called "Start Project". The "Start Project" activity shall have: a "ES" constraint, a constraint date equal to the date that the NTP was acknowledged, and a zero day duration.

3.3.3.2 Constraint of Last Activity

Completion of the last activity in the schedule shall be constrained by the contract completion date. Calculation on project updates shall be such that if the early finish of the last activity falls after the contract completion date, then the float calculation shall reflect a negative float on the critical path. The Contractor shall include as the last activity in the project schedule an activity call "End Project". The "End Project" activity shall have: a "LF" constraint, a constraint date equal to the completion date for the project, and a zero day duration.

3.3.3.3 Early Project Completion

In the event the project schedule shows completion, the project prior to the contract completion date, the Contractor shall identify those activities that have been accelerated and/or those activities that are scheduled in parallel to support the Contractor's "early" completion. Contractor shall specifically address each of the activities noted at every project schedule update period to assist the Contracting Officer to evaluate the Contractor's ability to actually complete prior to the contract period.

3.3.4 Interim Completion Dates

Contractually specified interim completion dates shall also be constrained to show negative float if the early finish date of the last activity in that phase falls after the interim completion date.

3.3.4.1 Start Phase

The Contractor shall include as the first activity for a project phase an activity called "Start Phase X" where "X" refers to the phase of work. The "Start Phase X" activity shall have: a "ES" constraint, a constraint date equal to the date that the NTP was acknowledged, and a zero day duration.

3.3.4.2 End Phase

The Contractor shall include as the last activity in a project phase an activity called "End Phase X" where "X" refers to the phase of work. The "End Phase X" activity shall have: a "LF" constraint, a constraint date equal to the completion date for the project, and a zero day duration.

3.3.4.3 Phase X

The Contractor shall include a hammock type activity for each project phase called "Phase X" where "X:" refers to the phase of work. The "Phase X" activity shall be logically tied to the earliest and latest activities in the phase.

3.3.5 Default Progress Data Disallowed

Actual Start and Finish dates shall not be automatically updated by default mechanisms that may be included in CPM scheduling software systems. Actual Start and Finish dates on the CPM schedule shall match those dates provided from Contractor Quality Control Reports. Failure of the Contractor to document the Actual Start and Finish dates on the Daily Quality Control report for every in progress or completed activity and insure that the data contained on the Daily Quality Control reports is the sole basis for schedule updating shall result in the disapproval of the Contractor's schedule and the inability of the Contracting Officer to evaluate Contractor progress for payment purposes.

3.3.6 Out-of-Sequence Progress

Activities that have posted progress without predecessors being completed (Out-of-Sequence Progress) shall be allowed only by the case-by-case approval of the Contracting Officer. The Contracting Officer may direct that changes in schedule logic be made to correct any or all out-of-sequence work.

3.3.7 Extended Non-Work Periods

Designation of Holidays to account for non-work periods of over 5 days shall not be allowed. Non-work periods of over 5 days shall be identified by addition of activities that represent the delays. Modifications to the logic of the project schedule shall be made to link those activities that may have been impacted by the delays to the newly added delay activities.

3.3.8 Negative Lags

Lag durations contained in the project schedule shall not have a negative value.Lag durations contained in the project schedule shall not have a negative value.

3.4 PROJECT SCHEDULE SUBMISSIONS

The Contractor shall provide the submissions as described below. The data disk, reports, and network diagrams required for each submission are contained in paragraph SUBMISSION REQUIREMENTS.

3.4.1 Preliminary Project Schedule Submission

The Preliminary Project Schedule, defining the Contractor's planned operations for the first 60 calendar days shall be submitted for approval within 10 calendar days after Notice to Proceed is acknowledged. The approved preliminary schedule shall be used for payment purposes not to exceed 60 calendar days after Notice to Proceed.

3.4.2 Initial Project Schedule Submission

The Initial Project Schedule shall be submitted for approval within 40 calendar days after Notice to Proceed. The schedule shall provide a reasonable sequence of activities which represent work through the entire project and shall be at a reasonable level of detail.

3.4.3 Periodic Schedule Updates

Based on the result of progress meetings, specified in "Periodic Progress Meetings," the Contractor shall submit periodic schedule updates. These submissions shall enable the Contracting Officer or to assess Contractor's progress. If the Contractor fails or refuses to furnish the information and project schedule data, which in the judgment of the Contracting Officer or authorized representative, is necessary for verifying the contractor's progress, the Contractor shall be deemed not to have provided an estimate upon which progress payment may be made.

3.4.4 Standard Activity Coding Dictionary

The Contractor shall submit, with the Initial Project Schedule, a coding scheme that shall be used throughout the project for all activity codes contained in the schedule. The coding scheme submitted shall list the values for each activity code category and translate those values into project specific designations. For example, a Responsibility Code Value, "ELE", may be identified as "Electrical Subcontractor." Activity code values shall represent the same information throughout the duration of the contract. Once approved with the Initial Project Schedule submission, changes to the activity coding scheme must be approved by the Contracting Officer's Representative.

3.5 SUBMISSION REQUIREMENTS

The following items shall be submitted by the Contractor for the initial submission, and every periodic project schedule update throughout the life of the project:

3.5.1 Data Disks

Two data disks containing the project schedule shall be provided. Data on the disks shall be in the format specified in Appendix A, " Standard Data Exchange Format".

3.5.1.1 File Medium

Required data shall be submitted on 3.5 disks, formatted to hold 1.44 MB of data, under the MS-DOS Version 5.0 operating system.

3.5.1.2 Disk Label

A permanent exterior label shall be affixed to each disk submitted. The label shall indicate the type of schedule (Initial, Update, or Change), full contract number, project name, project location, data date, name and telephone number or person responsible for the schedule, and the MS-DOS version used to format the disk.

3.5.1.3 File Name

Each file submitted shall have a name related to either the schedule data date, project name, or contract number. The Contractor shall develop a naming convention that will insure that the names of the files submitted are unique. the Contractor shall submit the file naming convention to the Contracting Officer for approval.

3.5.2 Narrative Report

A Narrative Report shall be provided with each update of the project schedule. This report shall be provided as the basis of the Contractor's progress payment request. The Narrative Report shall include: a description of activities along the 4 most critical paths, a description of current and anticipated problem areas or delaying factors and their impact, and an explanation of corrective actions taken.

3.5.3 Approved Changes Verification

Only project schedule changes that have been previously approved by the Contracting Officer shall be included in the schedule submission. The Narrative Report shall specifically reference, on an activity by activity basis, all changes made since the previous period and relate each change to documented, approved schedule changes.

3.5.4 Schedule Reports

The format for each activity for the schedule reports listed below shall contain: Activity Numbers, Activity Description, Original Duration, Remaining Duration, Early Start Date, Early Finish Date, Late Start Date, Late Finish Date, Total Float. Actual Start and Actual Finish Dates shall be printed for those activities in-progress or completed.

3.5.4.1 Activity Report

A list of all activities sorted according to activity number or "I-NODE" AND "J-NODE" and then sorted according to Early Start Date. For

completed activities the Actual Start Date shall be used as the secondary sort.

3.5.4.2 Logic Report

A list of Preceding and Succeeding activities for every activity in ascending order by activity number and then sorted according to Early Start Date. For completed activities the Actual Start Date shall be used as the secondary sort.

3.5.4.3 Total Float Report

A list of all activities sorted in ascending order of total float. Activities which have the same amount of total float shall be listed in ascending order of Early Start Dates.

3.5.4.4 Earnings Report

A compilation of the Contractor's Total Earnings on the project from the Notice to Proceed until the most recent Monthly Progress Meeting. This report shall reflect the Earnings of specific activities based on the agreements made in the field and approved between the Contractor and Contracting Officer at the most recent Monthly Progress Meeting. Provided that the Contractor has provided a complete schedule update, this report shall serve as the basis of determining Contractor Payment. Activities shall be grouped by bid item and sorted by activity numbers. This report shall: sum all activities in a bid item and provide a bid item percent; complete and sum all bid items to provide a total project percent complete. The printed report shall contain, for each activity: Activity Number or "I-node" and "J--node", Activity Description, Original Budgeted Amount, Total Quantity, Quantity to Date, Percent Complete (based on cost), Earnings to Date.

3.5.4.5 Labor Loading.

For each activity shown on the logic report list the total amount of work required for the activity in man-hours, the number of workers assigned to the activity, the expected production rate for a worker, and the length of time (in work days) required to render the expected completion date for the activity. Completion dates on this report must agree with those on the logic report.

3.5.5 Network Diagram

The network diagram shall be required on the initial schedule submission and on bi-monthly (60 days) schedule update submissions. In addition to other submission requirements, a single mylar reproduceable 20 inch by 30 inch size shall be submitted. The diagram shall also The network diagram shall depict and display the order and interdependence of activities and the sequence in which the work is to be accomplished. The Contracting Officer will use, but is not limited to, the following conditions to review compliance with this paragraph:

3.5.5.1 Continuous Flow

Diagrams shall show a continuous flow from left to right with no arrows from right to left. The activity or event number, description, duration, and estimated earned value shall be shown on the diagram.

3.5.5.2 Project Milestone Dates

Dates shall be shown on the diagram for start of project, any contract required interim completion dates, and contract completion dates.

3.5.5.3 Critical Path

The critical path shall be clearly shown.

3.5.5.4 Banding

Activities shall be grouped to assist in the understanding of the activity sequence. Typically, this flow will group activities by category of work, work area and/or responsibility.

3.5.5.5 S-Curves

Earnings curves showing projected early and late earnings and earnings to date.

3.6 PERIODIC PROGRESS MEETINGS

Progress meetings to discuss payment shall include a monthly on-site meeting or other regular intervals mutually agreed to at the preconstruction conference. During this meeting the Contractor will describe, on an activity by activity basis, all proposed revisions and adjustments to the project schedule required to reflect the current status of the project. The Contracting Officer will approve activity progress, proposed revisions, and adjustments as appropriate.

3.6.1 Meeting Attendance

The Contractor's Project Manager and Scheduler shall attend the regular progress meeting.

3.6.2 Update Submission Following Progress Meeting

A complete update of the project schedule containing all approved progress, revisions, and adjustments, based on the regular progress meeting, shall be submitted not later than 4 working days after the monthly progress meeting.

3.6.3 Progress Meeting Contents

Update information, including Actual Start Dates, Actual Finish Dates, Remaining Durations, and Cost to Date shall be subject to the approval of the Contracting Officer. The following minimum set of items which the Contractor shall address, on an activity by activity basis, during each progress meeting.

3.6.3.1 Start and Finish Dates

The Actual Start and Actual Finish dates for each activity currently in-progress or completed activities.

3.6.3.2 Time Completion

The estimated Remaining Duration for each activity in-progress. Time-based progress calculations must be based on Remaining Duration for each activity.

3.6.3.3 Cost Completion

The earnings for each activity started. Payment shall be based on earnings for each in-progress or completed activity. Payment for individual activities shall not be made for work that contains quality defects. A portion of the overall project amount may be retained based on delays of activities.

3.6.3.4 Logic Changes

All logic changes pertaining to Notice to Proceed on change orders, change orders to be incorporated into the schedule, contractor proposed changes in work sequence, corrections to schedule logic for out-of-sequence progress, [lag durations,] and other changes that have been made pursuant to contract provisions shall be specifically identified and discussed.

3.6.3.5 Other Changes

Other changes required due to delays in completion of any activity or group of activities are those delays beyond the Contractors control such as strikes and unusual weather. Also included are delays encountered due to submittals, Government Activities, deliveries or work stoppage which makes re-planning the work necessary, and when the schedule does not represent the actual prosecution and progress of the work.

3.7 REQUESTS FOR TIME EXTENSIONS

In the event the Contractor requests an extension of the contract completion date, he shall furnish such justification, project schedule data and supporting evidence as the Contracting Officer may deem necessary for a determination as to whether or not the Contractor is entitled to an extension of time under the provisions of the contract. Submission of proof of delay, based on revised activity logic, duration, and costs (updated to the specific date that the delay occurred) is obligatory to any approvals.

3.7.1 Justification of Delay

The project schedule must clearly display that the Contractor has used, in full, all the float time available for the work involved with this request. The Contracting Officer's determination as to the number of allowable days of contract extension, shall be based upon the

project schedule updates in effect for the time period in question and other factual information. Actual delays that are found to be caused by the Contractor's own actions, which result in the extension of the schedule, shall not be a cause for a time extension to the contract completion date.

3.7.2 Submission Requirements

The Contractor shall submit a justification for each request for a change in the contract completion date of under two weeks based upon the most recent schedule update at the time of the Notice to Proceed or constructive direction issued for the change. Such a request shall be in accordance with the requirements of other appropriate Contract Clauses and shall include, as a minimum:

a. A list of affected activities, with their associated project schedule activity number.

b. A brief explanation of the causes of the change.
c. An analysis of the overall impact of the changes proposed.
d. A sub-network of the affected area.

Activities impacted in each justification for change shall be identified by a unique activity code contained in the required data file.

3.7.3 Additional Submission Requirements

For any request for time extension for over 2 weeks, the Contracting Officer may request an interim update with revised activities for a specific change request. The Contractor shall provide this disk within 4 days of the Contracting Officer's request.

3.8 DIRECTED CHANGES

If Notice to Proceed (NTP) is issued for changes prior to settlement of price and/or time, the Contractor shall submit proposed schedule revisions to the Contracting Officer within 2 weeks of the NTP being issued. The proposed revisions to the schedule will be approved by the Contracting Officer prior to inclusion of those changes within the project schedule. If the Contractor fails to submit the proposed revisions, the Contracting Officer may furnish the Contractor suggested revisions to the project schedule. The Contractor shall include these revisions in the project schedule until the Contractor submits revisions, and final changes and impacts have been negotiated. If the Contractor has any objections to the revisions furnished by the Contracting Officer, then the Contractor shall advise the Contracting Officer within 2 weeks of receipt of the revisions. Regardless of the objections, the Contractor will continue to update their schedule with the Contracting Officer's revisions until a mutual agreement in the revisions may be made. If the Contractor fails to submit alternative revisions within 2 weeks of receipt of the Contracting Officer's proposed revisions, the Contractor will be deemed to have concurred with the Contracting Officer's proposed revisions. The proposed revisions will then be the basis for an equitable adjustment for performance of the work.

3.9 OWNERSHIP OF FLOAT

Float available in the schedule, at any time, shall not be considered for the exclusive use of either the Government or the Contractor.

-- End of Section -

SECTION 01420

SAFETY
nyd 7/01

1.0 **SAFETY**:

The contractor shall comply with all applicable Federal, State, and local safety and occupational health laws and regulations. Applicable provisions of the Corps of Engineers manual entitled Safety and Health Requirements Manual EM 385-1-1, dated 3 September 1996 will be applied to all work under this contract.

1.1 **U.S. ARMY CORPS OF ENGINEERS SAFETY AND HEALTH REQUIREMENTS MANUAL, EM 385-1-1**:

This paragraph applies to contracts and purchase orders that require the Contractor to comply with EM 385-1-1 (e.g. contracts that include the Accident Prevention clause at FAR 52.236-13 and/or other safety provisions). EM 385-1-1 and its changes are available at http://www.hq.usace.army.mil (at the HQ homepage, select Safety and Occupational Health and then select Changes to EM). The Contractor shall be responsible for complying with the current edition and all changes posted on the web as set in this solicitation.

1.2 In the Contractor's development and implementation of his site specific Site Safety and Health Plan (SSHP), the Contractor shall collect and obtain the necessary field sampling data to the extent that it shall satisfy him (The Contractor) in implementing and executing the safety measures that is required of him to complete his work.

2.0 **ACCIDENT PREVENTION PROGRAM**:

Within fifteen (15) calendar days after receipt of Notice to Proceed, and at least ten (10) calendar days prior to the Pre-construction Safety Conference, four (4) copies of the Accident Prevention Plan shall be submitted for review and acceptance by the Contracting Officer or the Contracting Officers Representative (COR). The accident prevention program shall be prepared in the format outlined in Appendix A of EM 385-1-1, "Minimum Basic Requirements for Accident Prevention Plan".

3.0 **HAZARD ANALYSIS**:

Prior to beginning each major phase of work, an Activity Hazard Analysis shall be prepared by the Contractor performing that work, and submitted for review and acceptance. The format shall be in accordance with EM 385-1-1, figure 1-1. A major phase of work is defined as an operation involving a type of work presenting hazards not experienced in previous operations or where a new contractor or work crew is to perform. (See Contractor Quality Control specification for further guidance regarding coordination of "Activities" and "Principal Steps" indicated in the Activity Hazard Analysis with Contractor Quality Control activities). The analysis shall define the activities to be performed and identify the sequence of work, the specific hazards

anticipated, and the control measures to be implemented to eliminate or reduce each hazard to an acceptable level. Work shall not proceed on that phase until the activity hazard analysis has been accepted and a preparatory meeting has been conducted by the Contractor to discuss its contents with everyone engaged in the activities, including the government on-site representative(s). The activity hazard analyses shall be continuously reviewed and when appropriate modified to address changing site conditions or operations, with the concurrence of the site safety representative, the site superintendent, and the Contracting Officer. Activity hazard analyses shall be attached to and become part of the accident prevention plan. It may also be developed prior to each phase of work undertaken in the contract. (Sample copies of the ACTIVITY HAZARD ANALYSIS form are provided in the Safety and Health Requirements Manual EM 385-1-1).

3.1 Hazard analysis shall be used to identify and evaluate all substances, agents, or environments that present hazards and recommend control measures. Engineering and administrative controls shall be used to control hazards; in cases where engineering or administrative controls are not feasible, personal protective equipment may be used.

3.2 Information contained in MSDS (Material Safety Data Sheets) shall be incorporated in the hazard analysis for the activities in which hazardous or toxic materials will be used, or generated (e.g. fiberglass, crystalline silica, metal dust or fume, etc.).

4.0 **SITE SAFETY OFFICER**:

The contractor shall identify an individual directly employed by the contractor as Site Safety Officer responsible to the Contractor to implement and continually enforce the Accident Prevention Plan. The site safety officer shall not be the same individual as the Quality Control System Manager if the CQC System Manager is required to have no duties other than Quality Control. The site safety officer shall have the authority to suspend operational activities if the health and safety of personnel are endangered, and to suspend an individual from operational activities for infractions of the Accident Prevention Plan.

4.1. Qualifications: The name, qualifications (training and experience) of the designated Site Safety Officer shall be included in the Accident Prevention Plan. The Site safety officer shall have the following qualifications:

a. A minimum of 5 years construction experience with at least 2 years experience in implementing safety programs at construction work sites for projects of comparable scope and complexity.
b. Documented experience in construction techniques and construction safety procedures.
c. Working knowledge of Federal and state occupational health and safety regulations.
d. Specific training in excavation safety, fall protection, and confined space.
e. CPR/First Aid certification (current)
f. Familiarity with and ability to use and implement the Corps of Engineers Safety Manual EM 385-1-1.

4.2. Other Requirements: Other sections of the contract documents may also require separate specially qualified individuals in such areas as chemical data acquisition, sampling and analysis, medical monitoring, industrial hygiene, quality control, etc.

5.0 **SITE INSPECTIONS**:

The site safety officer shall perform daily inspections of the job sites and the work in progress to ensure compliance with EM 385-1-1 and to determine the effectiveness of the accident prevention plan. Daily inspection logs shall be used to document inspections noting safety and health deficiencies, deficiencies in the effectiveness of the accident prevention plan, and corrective actions including timetable and esponsibilities. The daily inspection logs will be attached to and submitted with the Daily Quality Control Reports or may be incorporated in the daily CQC report. Each entry shall include date, work area checked, employees present in work area, protective equipment and work equipment in use, special safety and health issues and notes, and signature of the preparer.

6.0 **HIGHLIGHTED PROVISIONS**:

In addition to those items contained in EM 385-1-1, Appendix A, include the following items in the accident prevention plan:

6.1 Hard Hat Area. A statement that the jobsite is classified a "hard hat" area from start to finish.

6.2 Sanitation and Medical Requirements. Estimate the greatest number of employees, supervisors, etc., to be working at peak construction period, including subcontractor personnel. Include sanitation requirements and medical facilities identified for the job site. If a medical facility or physician is not accessible within five minutes of an injury to a group of two or more employees for the treatment of injuries, identify at least two or more employees on each shift who are qualified to administer first aid and CPR.

6.3 Equipment Inspection. The type of inspection program on cranes, trucks, and other types of construction equipment the Contractor plans to implement. Who will be responsible for the inspection and how the Contractor will control equipment of sub-contractors and equipment bought to the site by rental companies. Types of records to be kept.

6.3.1 Copies of records of all equipment inspections will be kept at the job site for review by the designated authority.

6.4 Crane & Derrick Operators: Written proof of qualification for all crane and derrick operators in accordance with EM 385-1-1, 16.C.04. Qualification shall be by written (or oral) examination and practical operating examination unless the operator is licensed by a state or city licensing agency for the particular type of crane or derrick. Proof of qualification shall be provided by the qualifying source.

6.5 Critical Lifts: are defined as non-routine crane lifts requiring detailed planning and additional or unusual safety precautions. Critical lifts include lifts made when the load weight is 75% of the rated capacity of the crane; lifts which require the load will be

lifted, swung, or placed out of the operator's view; lifts made with more than one crane; lifts involving non-routine or technically difficult rigging arrangement; hoisting personnel with a crane or derrick; or any lift which the lift operator believes should be considered critical.

6.6 Critical Lift Plan: Before making a critical lift, a critical lift plan shall be prepared by the crane operator, lift supervisor, and rigger. The New York District Safety Office Critical Lift Plan shall be completed by the contractor, signed by an officer of the company, and submitted to the Contracting Officer's Representative (COR) for acceptance prior to the lift.

6.7 Haul Road Plan: For every access and haul road, a plan shall be submitted to the Contracting Officer's Representative (COR). The plan shall address the following:

a. equipment usage, traffic density, and hours of operation;
b. road layout and widths, horizontal and vertical curve data, and sight distances;
c. sign and signal person requirements, road markings, and traffic control devices;
d. drainage controls;
e. points of contact between vehicles and the public; and safety controls at these points of contact; and
f. maintenance requirements, including roadway hardness and smoothness and dust control.

7.0 **ACCIDENT REPORTS**:

The contractor shall immediately report all accidents by telephone to the COR.

7.1 The Contractor will provide an initial written report of the accident to the COR within 24 hours. The Contractor shall complete and submit ENG Form 3394 for all accidents involving lost work time, medical treatment, and/or property damage in excess of $2000.00 within 48 hours of the accident. The report shall accurately represent the circumstances of the accident, cause of the accident, extent of medical treatment, extent of injuries and steps to prevent occurrence of similar accidents. The hazard analysis covering the work activity being undertaken during the accident shall be attached to the report.

7.2 Daily records of all first aid treatment not otherwise reportable shall be maintained at the job site and furnished to the designated authority upon request. Records shall also be maintained of all exposure and accident experience incidental to the work (OSHA Form 200 or equivalent as prescribed by 29 CFR 1904).

8.0 **MONTHLY EXPOSURE REPORTS**:

The Contractor shall submit to the COR no later than the 1st day of each month, a compilation of manhours worked each month by the prime contractor and each subcontractor. In addition ,the contractor shall report the number of accidents, severity, class of accidents, and lost time work days for each month.

9.0 **CLEAN-UP**:

The Contractor's Accident Prevention Plan shall identify the individual's responsible for cleanup and shall establish a regular housekeeping procedure and schedule. If the COR determines that cleanup is not being performed satisfactorily, the Contractor shall establish a work crew to perform the continuous cleanup required by the contract clause titled: CLEANING UP: The number of individuals appointed to the cleanup work crew shall be increased as required in order to render adequate cleanup.

10.0 **FOCUS AREAS**:

To supplement and emphasize the requirements of EM 385-1-1, the following is provided and shall be met as applicable.

10.1 Electrical Work: Electrical work shall not be performed on or near energized lines or equipment unless specified in the plans and specifications and approved by the COR. Plan and layout of proposed temporary power to the construction site shall be submitted and approved by the COR before work will be permitted.

10.1.1 Upon request by the Contractor, arrangements will be made for de-energizing lines and equipment so that work may be performed. All outages shall be requested through the COR a minimum of 14 days, unless otherwise specified, prior to the beginning of the specified outages. Dates and duration will be specified.

10.2 If approved by the COR and the ARDEC HV Line Foreman, the following work may be performed, in accordance with all local rules and regulations, with the lines energized using certified hot line equipment on lines above 600 volts, when the following conditions have been met:

a. work below the conductors no closer than the clearance required in EM 385-1-1 from the energized conductors.
b. setting and connection of new pre-trimmed poles in energized lines which do not replace an existing pole.
c. setting and removing transformers or other equipment on poles.
d. installation or removal of hot line connectors, jumpers, for temporary isolation, etc., which are accomplished with hot line equipment from an insulated bucket truck.

10.3 Energized Line Work Plan: The Contractor shall submit a plan, in writing, describing his/her method of operation and the equipment to be used on energized lines. Proper certification from an approved source of the safe condition of all tools and equipment will be provided with the plan. The work will be planned and scheduled so that proper supervision is maintained. Emergency procedures, including communication, for disconnecting power in the event of an accident will be outlined in the plan. The Contractor will review his/her plan with the COR prior to being granted permission to perform the work.

10.4. No work on lines greater than 600 volts will be performed from the pole or without the use of an insulated bucket truck.

10.5 Energized Lines: No work will be done on overbuilt lines while underbuilt lines are energized, except for temporary isolation and switching.

10.6 Electrical Tools and Cords: Hand held electrical tools shall be used only on circuits protected by ground fault circuit interrupters for protection of personnel. All general use extension cords shall be hard usage or extra hard usage as specified in Table 11-1 of EM 385-1-1. Damaged or repaired cords shall not be permitted.

10.7 Temporary Power: Temporary electrical distribution systems and devices shall be checked and found acceptable for polarity, ground continuity, and ground resistance before initial use and after modification. GFI outlets shall be installed and tested with a GFI circuit tester (tripping device) prior to use. Portable and vehicle mounted generators shall be inspected for compliance with EM 385-1-1 and NFPA 70. All electrical equipment located outdoors or in wet locations shall be enclosed in weatherproof enclosures in accordance with EM 385-1-1. Records of all tests and inspections will be kept by the contractor and made available on site for review by the designated authority. Submit sketch of proposed temporary power for acceptance.

10.8 Rollover Protective Structures (ROPS): Seat belts and ROPS shall be installed on all construction equipment as required by paragraph 16.B.12 of EM 385-1-1. The operating authority will furnish proof from the manufacturer or licensed engineer that ROPS meets the applicable SAE standards cited in EM 385-1-1, pg. 257.

10.9 Radiation Permits or Authorizations: Contractors contemplating the use of a licensed or DOD regulated radiological device or radioactive material on a DOD installation will secure appropriate permit or authorization from the Department of Army or Department of the Air Force, as applicable. A 45-day lead-time should be programmed for obtaining the necessary authorization or permit. When requested, the COR will assist the Contractor in obtaining the required permit or authorization.

10.9.1 The Contractor shall develop and implement a radiation safety program to comply with EM 385-1-1, Section 06.E. Provisions for leak tests, authorized personnel, transport certificates, etc. will be addressed in the radiation safety program.

10.10 Elevating Work Platforms: All elevating work platforms shall be designed, constructed, maintained, used, and operated in accordance with ANSI A92.3, ANSI A92.6, ANSI A92.5 and EM 385-1-1, Sections 22.J and 16.A.

10.10.1 Only personnel trained in the use of elevating work platforms shall be authorized to use them. A list of authorized users will be maintained by the contractor at the job site. The list will be updated to remain current and made available for review on site by the designated authority. Personnel safety belts must be worn.

10.11 Fall Protection: Fall protection in the form of standard guardrails, nets, or personal fall arrest systems will be provided for all work conducted over 6 feet in height The contractor will submit

his/her proposed method of fall protection to the COR as part of the Job Hazard Analysis for acceptance. If the contractor deems that conventional fall protection as described above is not feasible, or creates a greater hazard, the Contractor will prepare a written fall protection plan in accordance with OSHA 29 CFR 1926.502(k). The plan will demonstrate the reasons that conventional fall protection is unfeasible or constitutes a greater hazard and will provide alternative safety measures for review and acceptance by the COR.

10.12 Excavations:

All open excavations made in the earth's surface four (4) foot or greater will be under the supervision of a competent person trained in, and knowledgeable about, soils analysis, the use of protective systems, and the requirements of OSHA 29 CFR 1926, Subpart P and EM 385-1-1, Section 25. The competent person shall be designated in writing by the Contractor and a resume of their training and experience submitted to the COR for acceptance.

10.12.1 Excavations hazards and methods for their control will be specified in the job hazard analysis.

10.12.2 Sloping and benching: The design of sloping and benching shall be selected from and in accordance with written tabulated data, such as charts and tables. At least one copy of the tabulated data will be maintained at the job site.

10.12.3 Support Systems: shall be in accordance with one of the systems outlined in a through c below:

a. Designs drawn from manufacturer's specifications and in accordance with all specifications, limitations, and recommendations issued or made by the manufacturer. A copy of the manufacture's specifications, recommendations, and limitations will be in written form and maintained at the job site.
b. Designs selected from and in accordance with tabulated data (such as tables and charts). At least one copy of the design shall be maintained at the job site during excavation.
c. Designed by a registered engineer. At least one copy of the design shall be maintained at the job site during excavation.

10.12.4 Excavations Greater than 20 Feet in Height: Sloping and benching or support systems shall be designed by a registered professional engineer. Designs shall be in writing and at least one copy of the design shall be maintained at the job site during excavation. The contractor will ensure that the registered professional engineer is working within a discipline applicable to the excavation work; i.e. it would be inappropriate for an electrical engineer to approve shoring designed for an excavation.

10.13 Confined Space: The Contractor shall develop detailed written standard operating procedures for confined spaces in accordance with 29 CFR 1910.146 and EM 385-1-1, and as further described in this paragraph:

a. The contractor shall supply certificate of calibration for all testing and monitoring equipment. The certificate of calibration shall

include: type of equipment, model number, date of calibration, firm conducting calibration, and signature of individual certifying calibration.
b. The procedures shall include methods of inspection of personal protective equipment prior to use.
c. The procedures shall include work practices and other engineering controls to reduce airborne hazards and other potential hazards

(i.e. engulfment, hazardous energy, etc.) to a minimum.

10.14 Control of Hazardous Energy: Before any servicing or maintenance on a system where the unexpected energizing, start-up, or release of kinetic or stored could occur and cause injury or damage, the system shall be isolated in accordance with EM 385-1-1, Section 12 "Control of Hazardous Energy (Lockout/tagout)".

10.14.1 Hazardous Energy Control Plan: Contractor's planning the use of hazardous energy control procedures shall submit their hazardous energy control plan to the Contracting Officer Representative (COR) for acceptance. Implementation of hazardous energy control procedures shall not be initiated until the hazardous energy control plan has been accepted by the COR.

11.0 **LANGUAGE**: For each group that has employees that do not speak English, the Contractor will provide a bilingual foreman that is fluent in the language of the workers. The contractor will implement the requirements of EM 385-1-1, 01.B through these foremen.

12.0 **CONTRACTOR SAFETY MEETINGS AND DOCUMENTATION**: Contractor shall conduct and document safety meetings among its personnel as required by EM 385-1-1 and as indicated herein. Monthly meetings shall be held among all supervisors, and weekly meetings shall be conducted by supervisors or foreman for all workers. The agenda of the meeting shall include specific safety items pertinent to work being performed. Documentation shall include a summary of items discussed as well as other items required by the EM 385-1-1. Documentation shall be submitted to the Government monthly.

13.0 **COORDINATION WITH OTHER SPECIFICATION SECTIONS**: The requirements of this section are meant to supplement requirements of other sections. In cases of discrepancies the most stringent requirements shall apply . Other safety-related requirements can be found in the following specification section:

a. Specification Section 00800, Special Contract Requirements

14.0 **CONTRACTOR PERFORMANCE APPRAISAL**: The occurrence of accidents and near misses due to negligence are strong indications that there has been insufficient emphasis on effective implementation and/or commitment to the accident prevention program. Should it become obvious that only lip service is being given to this program, an interim unsatisfactory performance appraisal rating will be issued. If safety continues to be unsatisfactory or marginal, the unsatisfactory rating will become final. The contractor should be aware that this appraisal will be stored in a national computer database which can be accessed by a multitude of agencies or municipalities desiring information on

prospective contractors. An unsatisfactory rating in this database may affect the contractor's ability to obtain future Government work.

-- End of Section -

SECTION 01451

CONTRACTOR QUALITY CONTROL DESIGN-BUILD CONSTRUCTION
NYD REV. 6/2001

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 3740 (1996) Evaluation of Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction

ASTM E 329 (1995b) Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction

1.2 PAYMENT

No separate payment will be made for providing and maintaining an effective Quality Control program, and all costs associated therewith shall be included in the applicable unit prices or lump-sum prices contained in the Bidding Schedule.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 GENERAL

The Contractor is responsible for quality control and shall establish and maintain an effective quality control system in compliance with the Contract Clause titled "Inspection of Construction." The quality control system shall consist of plans, procedures, and organization necessary to produce an end product which complies with the contract requirements. The system shall cover all design and construction operations, both onsite and offsite, and shall be keyed to the proposed design and construction sequence. Other sections of the contract documents may also require separate specially-qualified individuals. The CQC organization will coordinate the activities of these individuals. The project Superintendent will be held responsible for the quality of work on the job and is subject to removal by the Contracting Officer for non-compliance with quality requirements specified in the contract. The project superintendent in this context shall mean the on-site individual with the responsibility for the overall management of the project including logistics and production.

3.2 QUALITY CONTROL PLAN

3.2.1 General

The Contractor shall furnish for review by the Government, not later than 10 days after receipt of notice to proceed, the Contractor Quality Control (CQC) Plan proposed to implement the requirements of the Contract Clause titled "Inspection of Construction." The plan shall identify personnel, procedures, control, instructions, test, records, and forms to be used. The Government will consider an interim plan to cover design operations for the first 60 days. The complete CQC plan must then be submitted no later than 60 days after Notice to Proceed. Design and Construction will be permitted to begin only after acceptance of the CQC Plan or interim plan.

3.2.2 Design Quality Control (DQC)

The Contractor shall provide and maintain an effective quality control program which will assure that all design services and products required for construction of this design-build contract are performed and provided in a manner that meets professional architectural and engineering quality standards and the requirements of the contract. The Contractor shall submit include elements and details of the DQC program in the CQC Plan. As a minimum, all design documents shall be technically reviewed by competent, independent reviewers identified in the DQC Plan. The same element that produced the product shall not perform the independent technical review (ITR). The Contractor shall correct errors and deficiencies in the design documents prior to submitting them to the Government. Design Schedule: The procedure for design schedule shall be included in the DQC portion of the CQC Plan. The Contractor shall include the design schedule in the master project schedule, showing the sequence of events involved in carrying out the project tasks within the specific contract period. This should be at a detailed level of scheduling sufficient to identify all major tasks including those that control the flow of work. The schedule shall include review and correction periods associated with each item. This should be a forward planning as well as a project monitoring tool. The schedule must reflect calendar days and not dates for each activity. If the schedule is changed, the Contractor shall submit a revised schedule reflecting the change within seven calendar days. Design schedule shall be coordinated with specification section "Project Schedule". The Contractor shall include in the DQC portion of the CQC Plan the discipline-specific checklists to be used during the design and quality control of each design submittal. These completed checklists shall also be submitted at each design phase as part of the project documentation. Sample checklists can be found in Corps of Engineers Engineering Regulations ER 1110-1-12, available on the internet. DQC shall be implemented by an assigned person with the Contractor's organization who has the responsibility of being present during the times work is in progress shall be cognizant of and assure that all documents on the project have been coordinated and that appropriate submittals of design products are current. This individual shall be a person who has verifiable engineering or architectural design experience and is a registered professional engineer or architect. Contractor shall indicate the name qualifications and responsibility and notify the Contracting Officer, in writing, of the name of the individual and the name of an alternate person assigned to the position.

3.2.3 Content of the CQC Plan

The CQC plan shall include, as a minimum, the following to cover all design and construction operations, both onsite and offsite, including work by subcontractors, designers of record, consultants, architect/engineer's (A/E's), fabricators, suppliers, and purchasing agents:

a. Details of the DQC system indicated above.

b. A description of the quality control organization, including a chart showing lines of authority and acknowledgment that the CQC staff shall implement the three phase control system for all aspects of the work specified. The staff shall include a CQC System Manager who shall report to the project manager or someone higher in the Contractor's organization. Project manager in this context shall mean the individual with responsibility for the overall management of the project including quality and production.

c. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function. Clear indication that CQC System Manager will have no duties other than Quality Control.

d. A copy of the letter to the CQC System Manager signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the CQC System Manager, including authority to stop work which is not in compliance with the contract. The CQC System Manager shall issue letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities. Copies of these letters will also be furnished to the Government.

e. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, designers of record, consultants, A/E's, off-site fabricators, suppliers, and purchasing agents. These procedures shall be in accordance with Section 01330 - SUBMITTAL PROCEDURES.

f. Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test. (Laboratory facilities will be approved by the Contracting Officer.) The Contractor shall incorporate all tests required by the contract (including systems commissioning and operating tests) to derive the above list of testing information which shall be presented in matrix form as part of the CQC Plan. This matrix shall be suitable for use by the Contractor and the Government as a checklist to control testing to be done on the contract. Coordinate any additional test submission or plan requirements for mechanical and electrical systems with appropriate specialized specification sections if applicable.

g. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation. Provide matrix of Preparatory and Initial inspections including specification reference paragraph, name of the Definable Feature of Work, and spaces for date performed, results and names of attendees.

h. Procedures for tracking construction deficiencies from identification through acceptable corrective action. These procedures will establish
verification that identified deficiencies have been corrected.

i. Reporting procedures, including proposed reporting formats. The Contractor shall utilize a Government-furnished software program titled "QCS" (Quality Control System). See specification section QUALITY CONTROL SYSTEM for additional details. Sample forms from QCS will be submitted with CQC Plan.
j. A list of the definable features of work. A definable feature of work is a task which is separate and distinct from other tasks and has separate control requirements. It could be identified by different trades or disciplines, or it could be work by the same trade in a different environment. Although each section of the specifications may generally be considered as a definable feature of work, there is frequently more than one definable feature under a particular section. This list will cover all features of work on the project, and will be agreed upon during the coordination meeting.
k. A brief explanation of the duties of the CQC organization with respect to safety. Note that separate Accident Prevention Plan and Hazards Analysis is required for submission and acceptance.
l. Contractor's plan for training all CQC personnel in the CQC System.

3.2.4 Acceptance of Plan

Acceptance of the Contractor's plan is required prior to the start of design and/or construction. Acceptance is conditional and will be predicated on satisfactory performance during the design and construction phases. The Government reserves the right to require the Contractor to make changes in his CQC plan and operations including removal of personnel, as necessary, to obtain the quality specified.

3.2.5 Notification of Change

After acceptance of the CQC plan, the Contractor shall notify the Contracting Officer in writing a minimum of seven calendar days prior to any proposed change. Proposed changes are subject to acceptance by the Contracting Officer.

3.3 COORDINATION MEETING

After the Pre-design Conference, before start of design and/or construction, and prior to acceptance by the Government of the Quality Control Plan, the Contractor shall meet with the Contracting Officer or Authorized Representative and discuss the Contractor's quality control system. The CQC Plan shall be submitted for review a minimum of 14 calendar days prior to the Coordination Meeting. The initial plan submitted must be found acceptable by the Government before the Coordination Meeting can be held. During the meeting, a mutual understanding of the system details shall be developed, including the forms for recording the CQC operations, design activities, control activities, testing, administration of the system for both onsite and offsite work, and the interrelationship of Contractor's Management and control with the Government's Quality Assurance. Minutes of the meeting shall be prepared by the Government and signed by both the Contractor and the Contracting Officer. The minutes shall become a part of the contract file. There may be occasions when subsequent conferences will be called by either party to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures which may require corrective action by the Contractor.

3.4 QUALITY CONTROL ORGANIZATION

3.4.1 General

The requirements for the CQC organization are a CQC System Manager, Designer of Record and sufficient number of additional qualified personnel to ensure contract compliance. The Contractor shall provide a CQC organization, which shall be at the site at all times during progress of the work and which shall have complete authority to take any action necessary to ensure compliance with the contract. All CQC staff members shall be subject to acceptance by the Contracting Officer.

3.4.2 CQC System Manager

The Contractor shall identify as CQC System Manager an individual within his organization at the site of the work who shall be responsible for overall management of CQC and have the authority to act in all CQC matters for the Contractor. The CQC System Manager shall be a graduate engineer, graduate architect, or a graduate of construction management, or shall hold a state Professional Engineer's license, with a minimum of 2 years construction experience on construction similar to this contract, one year of which as a Quality Control Representative. The CQC Manager may also be a construction person with a minimum of 4 years in related work, one year of which as a QC Representative. This CQC System Manager shall be on the site at all times during construction and will be employed by the prime Contractor. An alternate for the CQC System Manager will be identified in the plan to serve in the event of the System Manager's absence. The requirements for the alternate will be the same as for the designated CQC System Manager. The CQC System Manager shall be assigned no duties other than Quality Control.

3.4.3 Organizational Expertise

The CQC organization, which includes the CQC System Manager and additional qualified personnel, must as a minimum possess general corporate technical knowledge of all aspects of the project, and must successfully execute the CQC System on all aspects of the project. Individuals possessing experience in specialized areas shall be added to the organization as required during periods when such specialty areas are being executed. Examples of such specialized areas would include HVAC, electrical distribution and substations, roofing, telecommunication systems, fire protection and alarm systems, computer installations, specialized welding, specialized finishes, precast concrete installation, modular housing, specialized geotech work, dredging, sand placement and surveying, chemical data acquisition, hazardous material removal and disposal, medical monitoring, etc., depending on the nature of the particular project. The Contractor must demonstrate that such additional qualified personnel have received sufficient training and indoctrination into the CQC system, and that these personnel properly execute the requirements of the CQC System within their areas of expertise.

3.4.4 Additional Requirement

In addition to the above experience and education requirements the CQC System Manager shall have completed within the last five years the course entitled "Construction Quality Management for Contractors". This course is given by Government personnel and is of two-day duration. The Government will provide one instruction manual for the course.

3.4.5 Organizational Changes

The Contractor shall maintain the CQC Organization at full strength at all times. When it is necessary to make changes to the organization, the Contractor shall revise the CQC Plan to reflect the changes and submit the changes to the Contracting Officer for acceptance.

3.5 SUBMITTALS

For purposes of this contract, the term submittals refers to both design submittals and shop-drawing type submittals. Submittals shall be made as specified in Section 01330 SUBMITTAL PROCEDURES. The CQC organization shall be responsible for certifying that all submittals are in compliance with the contract requirements and are submitted in accordance with the date on the submittal register. CQC personnel shall also make physical checks of materials and equipment before installation to insure compliance with approved shop drawings.

3.6 CONTROL

Contractor Quality Control is the means by which the Contractor ensures that the construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. At least three phases of control shall be conducted by the CQC System Manager for each definable feature of work as follows:

3.6.1 Preparatory Phase

This phase shall be performed prior to beginning work on each definable feature of work after all required plans/documents/materials are approved/accepted, and after copies are at the worksite, and shall include:
a. A review of each paragraph of applicable specifications.
b. A review of the contract drawings.
c. A check to assure that all materials and/or equipment have been tested, submitted, and approved.
d. Review of provisions that have been made to provide required control inspection and testing.
e. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the contract.
f. A physical examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.
g. A review of the appropriate activity hazard analysis to assure safety requirements are met per EM 385-1-1, "Safety and Health Requirements Manual".
h. Discussion of procedures for controlling quality of the work

including repetitive deficiencies. Document construction tolerances and workmanship standards for that feature of work.
i. A check to ensure that the portion of the plan for the work to be performed has been accepted by the Contracting Officer.
j. Discussion of the initial control phase.
k. The Government shall be notified at least 48 hours in advance of beginning the preparatory control phase meeting. This phase shall include a meeting conducted by the CQC System Manager and attended by the superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. The results of the preparatory phase actions shall be documented by separate minutes prepared by the CQC System Manager and attached to the daily CQC report. The Contractor shall clearly indicate its intent and plan for communication of the results of the preparatory phase to applicable workers, to include materials, construction methods, workmanship standards, safety considerations and procedures, and preparatory phase meeting minutes.

3.6.2 Initial Phase

This phase shall be accomplished at the beginning of a definable feature of work (DFW) when the accomplishment of a representative sample of the work is impending. The following shall be accomplished:

a. A check of the portion of work done to ensure that it is in full compliance with contract requirements. Review minutes of the preparatory meeting.
b. Verify adequacy of controls to ensure full contract compliance. Verify required control inspection and testing.

c. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with required sample panels as appropriate.
d. Resolve all differences.
e. Check safety to include compliance with and upgrading of the safety plan and activity hazard analysis. Review the activity analysis with each worker.
f. The Government shall be notified at least 48 hours in advance of beginning the initial phase meeting. This phase shall include a meeting conducted by the CQC System Manager and attended by the superintendent, other CQC personnel (as applicable), the foreman responsible for the definable feature and the work crew(s) for the appropriate DFW. Separate minutes of this phase shall be prepared by the CQC System Manager and attached to the daily CQC report. Exact location (i.e. CQC Report number) of initial phase shall be indicated for future reference and comparison with follow-up phases.

3.6.3 Follow-up Phase

Daily checks shall be performed to assure control activities, including control testing, are providing continued compliance with contract requirements, until completion of the particular feature of work. The checks shall be made a matter of record in the CQC documentation. Final follow-up checks shall be conducted and all deficiencies corrected prior to the start of additional features of work which may be affected by the deficient work. The Contractor

shall not build upon or conceal non-conforming work.

3.6.4 Additional Preparatory and Initial Phases

Additional preparatory and initial phases shall be conducted on the same definable features of work if the quality of on-going work is unacceptable, if there are changes in the applicable CQC staff, onsite production supervision or work crew, if work on a definable feature is resumed after a substantial period of inactivity, or if other problems develop.

3.6.5 Definable Feature of Work: Definition and Discussion

A Definable Feature of Work (DFW) is a portion of work consisting of materials, equipment, supplies and procedures which are closely related to each other, have the same control and will be accomplished by the same work crew to completion. A DFW must be sufficiently small so that control of the work (i.e. communication of requirements to workers, inspection of materials and workmanship and correction of deficiencies) will be easily accomplished. Some examples for various types of projects are:

* Rough-in of electrical boxes and wiring methods
* Lighting fixtures, receptacles, and accessories
* Panelboards, circuit breakers and motors
* Communication system
* Fire alarm system
* Lightning protection and grounding
* Water supply piping, fittings and supports
* DWV piping, fittings and supports for plumbing
* Concrete reinforcement and formwork
* Concrete mixing, placement, curing and finishing
* Testing Procedure for contaminated soil, materials and storage tank contents
* Storage Tank disassembly and removal
* Setting up of decontamination area, exclusion zones and standard safety procedures for asbestos removal
* Asbestos removal and disposal procedures
* Chemical Data Acquisition
* Preparation, removal and disposal of contaminated material
* Dredging and placement.

3.7 TESTS

3.7.1 Testing Procedure The Contractor shall perform specified or required tests to verify that control measures are adequate to provide a product which conforms to contract requirements. Upon request, the Contractor shall furnish to the Government duplicate samples of test specimens for possible testing by the Government. Testing includes operation and/or acceptance tests when specified. The Contractor shall procure the services of a laboratory which has been assurance inspected by the Corps of Engineers within the last two years. The Contractor shall perform the following activities and record and provide the following data:

a. Verify that testing procedures comply with contract requirements.

b. Verify that facilities and testing equipment are available and comply with testing standards.

c. Check test instrument calibration data against certified standards.
d. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.
e. Results of all tests taken, both passing and failing tests, will be recorded on the CQC report for the date taken. Specification paragraph reference, location where tests were taken, and the sequential control number identifying the test will be given. If approved by the Contracting Officer, actual test reports may be submitted later with a reference to the test number and date taken. An information copy of tests performed by an off site or commercial test facility will be provided directly to the Contracting Officer. Failure to submit timely test reports as stated may result in nonpayment for related work performed and disapproval of the test facility for this contract. The Contractor shall maintain a test log of all tests performed, by type, date, and specification section.

3.7.2 Testing Laboratories

3.7.2.1 Capability Check

The Government reserves the right to check laboratory equipment and calibration in the proposed laboratory for compliance with the standards set forth in the contract specifications and to check the laboratory technician's testing procedures and techniques. Laboratories utilized for testing soils, concrete, asphalt, aggregate and steel shall meet criteria detailed in ASTM D 3740 and ASTM E 329. The Government requires a Corps of Engineers capability check of the laboratory which the contractor proposes to perform tests on soils, concrete, asphalt, aggregate and steel. If the laboratory proposed has not had the required Corps of Engineers capability check within the last two years, it will be performed by the Corps of Engineers at a cost of $7200 to the contractor. This cost will be paid by the Contractor via check directly to the Corps of Engineers Laboratory performing the inspection and report.

3.7.2.2 Capability Recheck

If the selected laboratory fails the capability check, the Contractor will be assessed a charge of $7200 to reimburse the Government for each succeeding recheck of the laboratory or the checking of a subsequently selected laboratory.

3.7.3 On-Site Laboratory

The Government reserves the right to utilize the Contractor's control testing laboratory and equipment to make assurance tests and to check the
Contractor's testing procedures, techniques, and test results at no additional cost to the Government.

3.7.4 Furnishing or Transportation of Samples for Testing

Costs incidental to the transportation of samples or materials will be borne by the Contractor. Samples of materials for test verification and acceptance testing by the Government shall be delivered to the Corps of Engineers Division Laboratory, as designated by the Government Representative. Coordination for each specific test, exact delivery location and dates will be made through the Area Office.

3.8 COMPLETION INSPECTION

3.8.1 Punch-Out Inspection

Near the completion of all work or any increment thereof established by a completion time stated in the Special Clause entitled "Commencement, Prosecution, and Completion of Work," or stated elsewhere in the specifications, the CQC System Manager shall conduct an inspection of the work and develop a "punch list" of items which do not conform to the approved drawings and specifications. Such a list of deficiencies shall be included in the CQC documentation, as required by paragraph DOCUMENTATION below, and shall include the estimated date by which the deficiencies will be corrected. The CQC System Manager or staff shall make a second inspection to ascertain that all deficiencies have been corrected. Once this is accomplished the Contractor shall notify the Government that the facility is ready for the Government's "Pre-final" inspection.

3.8.2 Pre-Final Inspection

The Government will perform this inspection to verify that the facility is complete and ready to be occupied. A Government "Pre-Final Punch List" may be developed as a result of this inspection. The Contractor's CQC System Manager shall ensure that all items on this list have been corrected before notifying the Government so that a Final inspection with the customer can be scheduled. Any items noted on the Pre-Final inspection shall be corrected in a timely manner. These inspections and any deficiency corrections required by this paragraph shall be accomplished within the time slated for completion of the entire work or an particular increment thereof if the project is divided into increments by separate completion dates.

3.8.3 Final Acceptance Inspection

The Contractor's Quality Control Inspection personnel, plus the superintendent or other primary management person, and the Contracting Officer's Representative shall be in attendance at this inspection. Additional Government personnel including, but not limited to, those from Base/Post Civil Facility Engineer user groups, and major commands may also be in attendance. The final acceptance inspection will be formally scheduled by the Contracting Officer based upon results of the Pre-Final inspection. Notice shall be given to the Contracting Officer at least 14

days prior to the final acceptance inspection and shall include the Contractor's assurance that all specific items previously identified to the Contractor as being unacceptable, along with all remaining work performed under the contract, will be complete and acceptable by the date scheduled for the final acceptance inspection. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the Contracting Officer to bill the Contractor for the Government's additional inspection cost in accordance with the contract clause titled "Inspection of Construction".

3.8.4 Post Completion Feedback Meeting and Preparation of Written Minutes

At the completion of this project, the CQC Systems Manager will host a meeting to review the project and to discuss lessons learned during the construction of the project. This meeting should be scheduled for 4 hours on-site and should be attended by the Project Manager and representatives of the major subcontractors, including mechanical and electrical. The Contracting Officer will invite members of the design team to participate in this meeting.

3.9 DOCUMENTATION

The Contractor shall maintain current records providing factual evidence that required quality control activities and/or tests have been performed. These records shall include the work of subcontractors and suppliers and shall be on an acceptable form that includes, as a minimum, the following information:

a. Contractor/subcontractor and their area of responsibility.
b. Operating plant/equipment with hours worked, idle, or down for repair.
c. Work performed each day, giving location, description, and by whom. When Network Analysis (NAS) is used, identify each phase of work performed each day by NAS activity number.
d. Test and/or control activities performed with results and references to specifications/drawings requirements. The control phase should be identified (Preparatory, Initial, Follow-up). List deficiencies noted along with corrective action.
e. Quantity of materials received at the site with statement as to acceptability, storage, and reference to specifications/drawings requirements.
f. Submittals reviewed, with contract reference, by whom, and action taken.
g. Offsite surveillance activities, including actions taken.
h. Job safety evaluations stating what was checked, results, and instructions or corrective actions.
i. Instructions given/received and conflicts in plans and/or specifications.
j. Contractor's verification statement.

These records shall indicate a description of trades working on the project; the number of Personnel working; weather conditions encountered; and any delays encountered. "N/A" shall be entered into any field for which no entry is intended. These records shall cover both conforming and deficient features and shall include a statement

that equipment and materials incorporated in the work and workmanship comply with the con tract. The original and one copy of these records in report form shall be furnished to the Government daily within 16 hours after the date covered by the report, except that reports need not be submitted for days on which no work is performed. As a minimum, one report shall be prepared and submitted for every 7 days of no work and on the last day of a no work period. All calendar days shall be accounted for throughout the life of the contract. The first report following a day of no work shall be for that day only. Reports shall be signed and dated by the CQC System Manager. The report from the CQC System Manager shall include copies of test reports and copies of reports prepared by all subordinate quality control personnel. All documentation is expected to be literate, legible and complete.

3.9.1 Correspondence

The Contractor shall establish and implement a serialized numbering system for letters sent to the Government. The numbering system shall identify the contract number and shall progress sequentially starting with the number one (1) and continuing thereafter without break in numbering. All letters sent to the Government shall include a subject heading which identifies the Contract Clause Number, Special Clause Number, or Technical Provision Number, and the particular subject item addressed by the letter.

3.10 SAMPLE FORMS

(Note: If the Quality Control System (QCS) is required to be used by the contractor for the QC System as indicated elsewhere in this contract, Contractor will generate all reports in the QCS System, and attached forms will serve as guidance only. Otherwise forms contained herein will be used by the by CQC Staff for CQC System reporting).

a. The 2-page form at the end of the section will be used for the basic CQC Report. CQC personnel shall attach continuation sheets as required for any entries which cannot fit on the basic form. Preparatory and Initial Inspections, when performed, shall be indicated on the basic CQC report and minutes for each inspection shall be attached. Minutes will consist of a list of specific requirements for materials, procedures or equipment to be employed and shall also include any understandings reached or items of special importance discussed.
b. In addition, outstanding deficiencies shall be listed on the form "List of Outstanding Deficiencies" at the end of this section and shall be attached to each CQC report. As deficiencies are corrected, they are to be acknowledged on the basic CQC report and shall be deleted from the list.
c. Form at the end of this section entitled "CQC Test Report List" shall be used by the Contractor to track testing to be done as the project progresses, and also to summarize the Contractor's Quality Control testing to be reported on the CQC Plan.
d. Form "Record of Preparatory and Initial Inspections" at the end of this section shall be used by the Contractor to track Preparatory and Initial inspections as the project progresses and also to summarize these required inspections as part of the CQC Plan.
e. Additional reporting forms pertaining to specialized activities may

be included herein or elsewhere in the contract, and shall be used for reporting as indicated.

3.11 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the worksite, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor. Deficiencies cited and verbal instruction instructions given to the Contractor by the Government Representative shall be entered into that day's CQC report. (FORMS FOLLOW)

-- End of Section -

SECTION 01452
TESTING FOR MECHANICAL AND ELECTRICAL SYSTEMS

1. Applicability

This section applies to all mechanical and electrical systems and all systems using electromagnetically driven equipment, pneumatic or electronic systems; high and low voltage electrical distribution systems (except branch panels) and to any system which incorporates this section into other parts of the specification by reference. For purposes of this section a "system" is an entity comprised of a series of closely related interdependent components and which is capable of independent performance of a useful function. System components shall include all software and programming as applicable for the system. Some typical examples include:

a. Independently functioning HVAC Systems.
b. Fire Alarm Systems.
c. Public Address Systems.
d. Lightning protection and grounding systems.
e. Sprinkler Systems including alarms.
f. Telephone Systems including line protectors, splices cables, switching equipment, outlets and instruments.
g. Intrusion Detection System.
h. High Voltage Equipment including cable, splices, switchgear, relays, circuit breakers, fuses, transformers, instrumentation, etc.
i. Low Voltage Switchboard including incoming and outgoing feeders, circuit protection and all accessories.

2. Test Plan

Not later than sixty days after Notice to Proceed, in accordance with Section "Submittals" and other paragraphs of the technical provisions, the Contractor shall submit a list for approval consisting of all systems for which test plans are required. This list will be reviewed by the Government and any systems found to be missing will be required to be added by the Contractor, and appropriate test plans submitted. No work will be permitted on any of the above systems until this list is submitted.

The Contractor shall develop test plans and schedule operational testing for the systems in the approved list. The testing shall be in accordance with the requirements in the appropriate technical provisions and shall include as a minimum the requirements below. All testing required by applicable codes, standards, utility companies, manufacturers, suppliers, etc. shall be incorporated into the Contractor's test plans. Test plans shall list all equipment required to perform the tests, and any Government support required. It shall be in sufficient detail to permit a step by step approach to the test and to demonstrate that the systems operate as intended by the contract documents. It shall describe as a minimum:

1. What system is being tested including a listing of all components to be tested.
2. What individual or organization will perform testing, who will certify the tests, and qualifications of test personnel.

3. A step by step narrative of the testing procedure to be used to demonstrate contract compliance including all governing standards, such as "sequence of controls", "ASTM Standard XXX"; or IEEE Standard XXX", etc.
4. What testing equipment will be utilized.
5. What operator interaction is required.
6. What results are to be expected.
7. Seasonal limitations, if any, including date(s) of proposed testing.
8. A complete schematic diagram (electrical, pneumatic) showing all components, and block diagram.
9. A checklist shall be developed to be used during the operational test.

Test plans shall be submitted for approval for all systems contained on the list submitted per para. 2a above. It is also desirable to submit all test plans as soon as possible so that the progress of the project and corresponding payments will proceed on schedule.

3. Testing Process

Outlined below are a number of events relating to the status of the test plan and testing. The corresponding percentages indicate the maximum percentage of the value of the system which will be permitted to be installed after the successful completion of the corresponding event indicated, for all systems to which this section applies. Events must be completed sequentially. Any work performed in excess of the permitted percentages will be at the Contractor's own risk and will not be paid until the event corresponding to the percentage of system value permitted to be installed is successfully completed:
EVENT MAX. % of SYSTEM VALUE PERMITTED TO BE INSTALLED
1. Contractor has submitted list 50 of systems that require test plans to be approved, and system work is ongoing but no test plan submitted.
2. Test Plan Submitted 65
3. *Test Plan Approved 80
4. Successful completion of tests **100 including submission of required documents, reports (i.e. balancing reports for all HVAC Systems), Operation and Maintenance Manuals spare parts, and spare parts data.

* The Government will process the submittal in accordance with the time frames indicated in the specification section "Submittals". If the test plan is disapproved the Government has an additional 30 days to review the resubmittal from the date it receives the resubmittal.

** If a system involves both heating and cooling modes and one mode has been successfully tested this percentage shall be reduced to 90% until the testing is completed.

The Contractor may proceed with events as indicated in the above table for each system separately.

4. Operational tests

Operational tests including performance tests shall be conducted for an entire system, not component parts only. Tests may be conducted only after an entire system has been completely installed. Contractor shall provide a minimum of 14 days notice to the Contracting Officer of

scheduled tests. This notice must include the Contractor's assurance that all installed work previously identified to the Contractor as being unacceptable along with all remaining work associated with the respective system will be complete and acceptable by the date scheduled for the operational test. Failure of the Contractor to have all contract work acceptably complete for this test will be cause for the Contracting Officer to bill the Contractor for the Government's additional inspection costs.

5. Tests certification

For each system the Contractor shall obtain the services of an experienced professional who shall certify that the operational test was conducted in accordance with the approved test plan and the results of this test meet all the contract requirements. These individuals must have a minimum of eight years experience in the testing of the particular system being tested and shall also meet qualifications (if any) set forth in other technical sections of the contract specifications.

6. System value

When considering the value of a system for payment purposes the following components shall be counted as part of a "system": All electro-magnetically driven equipment; pneumatic or electric control system; gauges, dampers, valves, actuators, controllers, pipes, test sensing elements, logic/processors, CPU's, ducts, insulation, wiring, conduit, switchgear, and all other mechanical or electrical components, devices or equipment which are essential to the proper function of the system such as pumps, motors, air-handling units, chillers, cooling towers, etc. Software programs and any refrigerants are also considered "parts" of a system.

7. Conflicting requirements

The requirements contained in this section supplement other testing requirements contained in the contract documents. If a conflict exists between the requirements of this section and other parts of the contract documents, the requirements of this section shall take precedence.

-- End of Section -

SECTION 01453

CONTRACTOR WARRANTY MANAGEMENT (NYD 4/99)

1. References:

a. Clause "Warranty of Construction", (FAR 52.246-0021)
b. Clause "Inspection of Construction" (FAR 52.246-12)
c. Special Requirement paragraph entitled "Record Drawings"
d. Specification Section entitled "Contractor Quality Control"

2. General: In order to insure that the Government systematically receives all warranties of construction, equipment and systems to which it is entitled, the contractor shall execute all actions as required by above references and as contained herein.
3. Post-Completion Inspections: For purposes of management of construction warranties, the Government conducts four and nine month warranty inspections with using agencies. The Contractor is encouraged to attend these inspections in order to better manage any warranty items for which it may be responsible.
4. Tagging of Extended Warranty Items: The Contractor shall install tags to identify items protected by extended warranty, i.e. longer than the one year general warranty of construction. The tags shall be minimum 3 inches by 5 inches in size, machine-printed in minimum 14-point type, and shall be weatherproof. Tags shall be attached to equipment if accessible or to accessible control panel, etc. As a minimum, tags shall indicate the following information:

"Extended Warranty Item:" Name of Item Name of System with which associated, number designation within system, or other identifier Model Number Serial Number Start and end Dates of Warranty Contract number Contract Name Contractor Name Point of Contact name, organization and telephone number.

5. Posting of Instructions: In addition to any posting of operating procedures as may be required elsewhere in this contract, any equipment or system for which proper operation or maintenance is critical in order to preserve warranties, prevent damage, or for reasons of safety shall have proper operating procedures posted near the equipment or near the operating point. Instructions shall be protected by 1/16 inch thick plastic sheet. As a minimum such equipment or system shall include:

Electrical Substations Transformers Electrical Generators Major HVAC System components including chillers, air-handlers, fans, etc. HVAC Control Panel
Boilers
Air Compressors

6. Warranty Meeting. At least 14 days prior to the 80% completion point of this contract (or deliverable phase thereof), the contractor will notify the Government representative for the purpose of scheduling a meeting to clarify understandings of responsibilities with respect to

warranties to which the Government is entitled. The Government and contractor shall attend the warranty meeting, as well as any subcontractors, or suppliers involved in the warranty process. The Warranty Plan (below) shall have already been submitted and approved by the Government before the warranty meeting can take place, and shall be the basis of the meeting's agenda.

7. Warranty Plan. At least 30 days before the planned warranty meeting, the contractor shall submit a warranty plan for Government approval per section "Submittals". The Warranty Plan shall include all required actions and documents to assure that the Government receives all warranties to which it is entitled. The plan shall be in narrative form and contain sufficient detail to render it suitable for use by future maintenance and repair personnel, whether tradesmen, or of engineering background, not necessarily familiar with this contract. The tern "status" as indicated below shall include due date and whether item has been submitted or was accomplished. As a minimum the plan shall indicate:

a. Roles and responsibilities of all personnel associated with the warranty process, including points of contact and telephone numbers within the organizations of the contractor's, subcontractors or suppliers involved.

b. Listing and status of O&M manuals and As-built drawings, and expected delivery dates.

c. Listing and status of all training to be provided to Government personnel, whether specified by contract or required by manufacturers.

d. Listing and status of delivery of all Certificates of Warranty for extended warranty items, to include roofs, HVAC balancing, pumps, motors, transformers, and for all commissioned systems such as fire protection and alarm systems, sprinkler systems, lightning protection systems, etc.

e. A list for each warranted equipment, item, feature of construction or system indicating:

- Name of item Model and serial numbers
- Location where installed
- Names of manufacturers or, suppliers and phone numbers
- Names addresses and telephone numbers of sources of spare parts
- Warranties and terms of warranty. (This shall include one-year overall warranty of constructions as required by ref. 1.a. Clearly indicates which items have extended warranties)
- Cross-reference to warranty certificates as applicable
- Starting point and duration of warranty period
- Summary of maintenance procedures required to continue the warranty in forces
- Cross-reference to specific pertinent Operation and Maintenance manuals Organization, names and phone numbers of persons to call for warranty service
- Typical response time and repair time expected for various warranted

equipment

f. The contractor's plans for attendance at the Four and Nine month post-construction warranty inspections conducted by the Government.

g. Procedure and status of tagging of all equipment covered by extended warranties.

h. Copies of instructions to be posted near selected pieces of equipment where operation is critical for warranty and/or safety reasons

-End of Section-

Explosion Research & Development Loading Facility (ERDLF)
Picatinny Arsenal, New Jersey

ATTACHMENTS

Attachment A	Room-by-room Requirements (Architectural, Mechanical, Electrical, Communications)
Attachment B	Picatinny Arsenal Installation Design Guide
Attachment C	Site Safety Plan, Picatinny ARDEC
Attachment D	Environmental Assessment dated July 2002
Attachment E	Substantial Dividing Walls (SDW)
Attachment F	Not Used
Attachment G	Not Used
Attachment H	Not Used
Attachment I	Not Used
Attachment J	Contaminated Waste Water (pink water) Profile
Attachment K	Not Used
Attachment L	Supplemental Test Pit Program
Attachment M	Standing Operating Procedure For Soil Management Procedures during Construction Activities Picatinny Arsenal, July 2003
Attachment N	Room Layout - Proposed Facilities
Attachment O	ACSIM Installation Design Guide
Attachment P	Not Used
Attachment Q	Civil Drawings
Attachment R	Communication Systems References
Attachment S	Picatinny Water Analysis Report dated 13 June 2003
Attachment T	Not Used
Attachment U	Not Used
Attachment V	Summarized Analytical Data from Nov 2003 Picatinny Phase II RI Report, Volume 2 - Area H Sites

Attachment W	Not Used
Attachment X	Forklift Data
Attachment Y	Construction Sign
Attachment Z	Not Used

End

ATTACHMENT A

ARCHITECTURAL ROOM BY ROOM REQUIREMENTS

ADMINISTRATION

ROOM	SPACE	ROOM SIZE		AREA	DOORS			CEILING HEIGHT		EQUIPMENT	FLOOR			INTERIOR WALL FINISHES			CEILING	EXTERIOR WALLS					(TYP) BAYS	HAZARDOUS	CONDUCTIVE/SPARK RESISTANT CONCRETE FLOORING
NUMBER	NAME	WIDTH	LENGTH	[sqft]	TYPE	W	H	TO FINISH CEILING		REQUIRMENTS	SLOPE	DRAINAGE	FINISH	CLASS A	ACCOUSTIC WALLS	CERAMIC TILE		TRANSLUCENT	CMU	REINFORCED CONCRETE	WINDOWS	EIFS		MATERIAL	
From Milling area to Bldg. 225 (+/-)	ENCLOSED WALKWAY WITH WEATHER PANELS	5' clear	472' (+/-)	2,360	As required			10' - clear					Concrete					yes							
100	LOBBY	Space allotment	Space allotment	100				9' - clear						yes	yes		UFGS 09510		yes			yes			
101	OPEN PLAN FOR OFFICES	Space allotment	Space allotment	560	D	6'-0"	7'-0"	9' - clear					Carpet	yes	yes		UFGS 09510		yes		As required	yes			
102	BREAK ROOM	Space allotment	Space allotment	172	A	3'-0"	7'-0"	9' - clear					Carpet	yes	yes		UFGS 09510		yes		As required	yes			
103	CONFERENCE ROOM	Space allotment	Space allotment	240	A	3'-0"	7'-0"	9' - clear					Carpet	yes	yes		UFGS 09510		yes		As required	yes			
104	MEN'S RESTROOMS	Space allotment	Space allotment	224	A	3'-0"	7'-0"	9' - clear		UFGS 10800, TOILET ACCESSORIES	yes	Floor drain	Ceramic Tiles	yes	UFGS 10153 Type 1 Partitions	yes	UFGS 09510		yes			yes			
105	WOMEN'S RESTROOMS	Space allotment	Space allotment	224	A	3'-0"	7'-0"	9' - clear		UFGS 10800, TOILET ACCESSORIES	yes	Floor drain	Ceramic Tiles	yes	UFGS 10153 Type 1 Partitions	yes	UFGS 09510		yes			yes			
106	JANITOR'S CLOSET	Space allotment	Space allotment	30	A	3'-0"	7'-0"	9' - clear		WALL SERVICE SINK	yes	Floor drain	Ceramic Tiles	yes		yes	UFGS 09510		yes			yes			
								TO STRUCTURE	TO EQUIPMENT																
107	ELECTRICAL	Space allotment	Space allotment	140	D	6'-0"	7'-0"	12' - clear	10' - clear					yes	yes		UFGS 09250		yes			yes			
108	COMMUNICATIONS	Space allotment	Space allotment	140	D	6'-0"	7'-0"	12' - clear	10' - clear					yes	yes		UFGS 09250		yes			yes			

PROCESSING

								TO STRUCTURE	TO EQUIPMENT																
From Milling area to end of Magazine (+/-)	ENCLOSED WALKWAY	8' - clear	598' (+/-)	4,784	As Required			10' - clear			yes		Concrete				UFGS 09250	yes				yes			
	LOADING DOCK (Covered)	Space allotment	Space allotment	400						See Civil, 2.8 Paragraph	yes		Concrete												
200	WASHING & DRYING	Space allotment	Space allotment	110	A	3'-0"	7'-0"	12' - clear	10' - clear	See Arch. 01010 4.4.2.8 LAUNDRY	yes	Floor drain	Ceramic Tiles	yes	yes	yes	UFGS 09250		yes			yes			
201	MECHANICAL ROOM	Space allotment	Space allotment	546	D	6'-0"	7'-0"	12' - clear	10' - clear	`	yes			yes	yes		UFGS 09250		yes			yes			
202	FIRE SPRINKLER	Space allotment	Space allotment	140	D	6'-0"	7'-0"	12' - clear	10' - clear					yes	yes		UFGS 09250		yes			yes			
203	ELECTRICAL	Space allotment	Space allotment	140	D	6'-0"	7'-0"	12' - clear	10' - clear					yes	yes		UFGS 09250		yes			yes			
204	COMMUNICATIONS	Space allotment	Space allotment	140	D	6'-0"	7'-0"	12' - clear	10' - clear					yes	yes		UFGS 09250		yes			yes			
205	NOT USED																								
206	MELT/POUR	24'- clear	24'-clear	576	E	6'-0"	8'-0"	12' - clear	10' - clear	2xKettles, 1xOven, Crane 1/2ton, wall mount	yes	yes: Trench	UFGS 09965N	yes						yes	As required	yes	(TYP) Utilities	350 lbs	See UFGS 09965N
207	DRYING OVEN	16'- clear	24'-clear	384	E	6'-0"	8'-0"	12' - clear	10' - clear	1x Drying Oven W/D/H 84"/64"/68"	yes	yes: Trench	UFGS 09965N	yes						yes	As required	yes	(TYP) Utilities	200 lbs	See UFGS 09965N
208	HOLSTEN STILLS	16'- clear	24'-clear	384	E	6'-0"	8'-0"	12' - clear	10' - clear	2x Holston Stell W/D/H 96"/57"/96"	yes	yes: Trench	UFGS 09965N	yes						yes	As required	yes	(TYP) Utilities	130 lbs	See UFGS 09965N
209	CURING OVEN	16'- clear	24'-clear	384	E	6'-0"	8'-0"	12' - clear	10' - clear		yes	yes: Trench	UFGS 09965N	yes						yes	As required	yes	(TYP) Utilities	200 lbs	See UFGS 09965N
210	BP MIXER	24'- clear	24'-clear	576	E	6'-0"	8'-0"	12' - clear	10' - clear	1x Mixer, Crane 1ton wall mount	yes	yes: Trench	UFGS 09965N	yes						yes	As required	yes	(TYP) Utilities	130 lbs	See UFGS 09965N
211	ROTARY PRESS	20'- clear	24'-clear	480	E	6'-0"	8'-0"	12' - clear	10' - clear		yes	yes: Trench	UFGS 09965N	yes						yes	As required	yes	(TYP) Utilities	200 lbs	See UFGS 09965N
212	X-RAY ROOM	24'- clear	24'-clear	576	E	6'-0"	8'-0"	12' - clear	10' - clear		yes	yes: Trench	UFGS 09965N	yes						yes	As required	yes	(TYP) Utilities	200 lbs	See UFGS 09965N
213	TENNEY OVEN	16'- clear	24'-clear	384	E	6'-0"	8'-0"	12' - clear	10' - clear	1x Oven W/D/H 50"/69"/90"	yes	yes: Trench	UFGS 09965N	yes						yes	As required	yes	(TYP) Utilities	200 lbs	See UFGS 09965N
214	ASSEMBLY	20'- clear	24'-clear	480	E	6'-0"	8'-0"	12' - clear	10' - clear		yes	yes: Trench	UFGS 09965N	yes						yes	As required	yes	(TYP) Utilities	200 lbs	See UFGS 09965N
215	GRUENBERG OVEN ROOM 1	16'- clear	24'-clear	384	E	6'-0"	8'-0"	12' - clear	10' - clear	2x Gruenberg Oven W/D/H 75"/75"/80"	yes	yes: Trench	UFGS 09965N	yes						yes	As required	yes	(TYP) Utilities	200 lbs	See UFGS 09965N
215A	UTILITY ROOM	Space allotment	Space allotment	140	D	6'-0"	7'-0"	12' - clear	10' - clear					yes	yes		UFGS 09250		yes			yes			
216	INSPECTION	20'- clear	24'-clear	480	E	6'-0"	8'-0"	12' - clear	10' - clear		yes	yes: Trench	UFGS 09965N	yes						yes	As required	yes	(TYP) Utilities	200 lbs	See UFGS 09965N
217	GRUENBERG OVEN ROOM 2	16'- clear	24'-clear	384	E	6'-0"	8'-0"	12' - clear	10' - clear	2x Gruenberg Oven W/D/H 75"/75"/80"	yes	yes: Trench	UFGS 09965N	yes						yes	As required	yes	(TYP) Utilities	200 lbs	See UFGS 09965N
218	SHOP ROOM	20'- clear	29'- clear	580	E	6'-0"	8'-0"	12' - clear	10' - clear		yes	yes: Trench	UFGS 09965N	yes						yes	As required	yes	(TYP) Utilities	200 lbs	See UFGS 09965N
219	CONDITIONING OVEN	16'- clear	24'- clear	384	E	6'-0"	8'-0"	12' - clear	10' - clear	1x Curing Oven W/D/H 69"/65"/77"	yes	yes: Trench	UFGS 09965N	yes						yes	As required	yes	(TYP) Utilities	100 lbs	See UFGS 09965N
219A	UTILITY ROOM	Space allotment	Space allotment	140	D	6'-0"	7'-0"	12' - clear	10' - clear					yes	yes		UFGS 09250		yes			yes			
220	CONTROL ROOM For Room 211	Space allotment	Space allotment	100	A	3'-0"	7'-0"	12' - clear	10' - clear				UFGS 09660	yes						yes	As required	yes			See (UFGS 09660 CONDUCTIVE VINYL FLOORING Aug. 2002)
221	CONTROL RM For Room 210	Space allotment	Space allotment	100	A	3'-0"	7'-0"	12' - clear	10' - clear				UFGS 09660	yes						yes	As required	yes			See (UFGS 09660 CONDUCTIVE VINYL FLOORING Aug. 2002)
222	CONTAMINATED WASTE WATER TANK	20'- clear	26'- clear	520	E	6'-0"	8'-0"	12' - clear	10' - clear											yes					

MACHINING

	INTERIOR WALKWAY	5' - clear	412' (+/-)	2,060	As Required			12' - clear	10' - clear		yes		UFGS 09965N	yes							As required	yes			See UFGS 09965N
300	CONTROL ROOM	Space allotment	Space allotment	100	A	3'-0"	7'-0"	12' - clear	10' - clear	Computer Control Equipment			UFGS 09660	yes						yes	As required	yes			See (UFGS 09660 CONDUCTIVE VINYL FLOORING Aug. 2002)
301	MACHINING ROOM 1	16'- clear	28'- clear	448	E	6'-0"	8'-0"	12' - clear	10' - clear	CNC Lathe W/D 8'/12'	yes	yes: Trench	UFGS 09965N	yes						yes	As required	yes	(TYP) Utilities	50 lbs.	See UFGS 09965N
302	MACHINING ROOM 2	20'- clear	24' - clear	480				12' - clear	10' - clear	Drill Press W/D 4'-10"/5'	yes	yes: Trench	UFGS 09965N	yes						yes	As required	yes	(TYP) Utilities	50 lbs.	See UFGS 09965N
303 to 313	NOT USED																								
314	CONTROL ROOM	Space allotment	Space allotment	100	A	3'-0"	7'-0"	12' - clear	10' - clear	Computer Control Equipment			UFGS 09660	yes						yes	As required	yes			See (UFGS 09660 CONDUCTIVE VINYL FLOORING Aug. 2002)

MAGAZINE

	ENCLOSED WALKWAY				As Required			10' - clear			yes			yes				yes							
400	STORAGE	14' - clear	14' - clear	196				10' - clear			yes			yes						yes				400lbs.	See UFGS 09965N
401	STORAGE	14' - clear	14' - clear	196				10' - clear			yes			yes						yes				400lbs.	See UFGS 09965N
402	STORAGE	14' - clear	14' - clear	196				10' - clear			yes			yes						yes				400lbs.	See UFGS 09965N
403	STORAGE	14' - clear	14' - clear	196				10' - clear			yes			yes						yes				400lbs.	See UFGS 09965N
		TOTAL SQ FEET		**21,858**																					

UFGS Specification 07240, Exterior Insulation and Finish System
UFGS Specification 09250, Gypsum Board
UFGS Specification 09510, Suspended Acoustical Ceilings
UFGS Specification 09660, Conductive Vinyl Flooring
UFGN Specification 09965N, Metallic Type Conductive/Spark Resistance Concrete Floor Finish (Aug. 2001)
UFGS Specification 08800, Glazing
UFGS Specification 08510, Steel Windows or 08520, Aluminum Windows
UFGS Specification 10153, Toilete Partitions
UFGS Specification 10800, Toilete Accessories
(CMU) Wall construction, DA Pamphlet 385-64 and AMC-R 385-100
See Civil Specs. 2.8 Parking, Delivery Truck Access and Loading Dock Area

"E" type door to swing 180 degree to outside

ELECTRICAL AND COMMUNICATIONS ROOM BY ROOM REQUIREMENTS CHARTS

CHART #1	**ELECTRICAL ROOM BY ROOM REQUIREMENTS**
(SHEET 2 OF 5)	(POWER, LIGHTING, AND NEC HAZARD)
CHART #2	**ELECTRICAL ROOM BY ROOM REQUIREMENTS**
(SHEET 4 OF 5)	(CONDUCTIVE FLOORING, GROUND BARS, HAZARD WARNING, EMPTY CONDUITS, BACK-UP POWER)
CHART #3	**COMMUNICATION ROOM BY ROOM REQUIREMENTS**
(SHEET 5 OF 5)	(PHONE, REMOTE CAMERA, PUBLIC ADDRESS)

GENERAL NOTE: Contractor shall supply power for all equipment installed in the building, including associated control circuits power, even if not indicated on the following charts. Upon award of contract, Contractor shall field verify electrical requirements of all Government Furnished Equipment (GFE) noted elsewhere in this RFP document with the User via the Contracting Officer prior to the first design submittal.

ELECTRICAL ROOM BY ROOM REQUIREMENTS (CHART #1)

(SEE EQUIPMENT, POWER, LIGHTING, AND NEC NOTES FOLLOWING CHART)		POWER		LIGHTING			NEC Hazard
		EQUIPMENT	120V RECPS	Fixture Type	Design FC	Control	
	ADMINISTRATION						
ROOM #	**SPACE**						
100	LOBBY		P1	L1	20	L7	NEC-1
101	OPEN PLAN FOR OFFICES		P1	L2	50	L7	NEC-1
102	BREAK ROOM		P1	L1	30	L7	NEC-1
103	CONFERENCE ROOM		P1	L2	50	L7	NEC-1
104	MEN'S RESTROOMS		P3	L8	20	L10	NEC-1
105	WOMEN'S RESTROOMS		P3	L8	20	L10	NEC-1
106	JANITORS CLOSET			L4	20	L7	NEC-1
107	ELECTRICAL		P1	L4	20	L7	NEC-1
108	COMMUNICATIONS		P5	L1	30	L7	NEC-1
	PROCESSING						
	ENCLOSED WALKWAY		P1	L3	20	L7	NEC-1
200	WASHING & DRYING	E20,E21	P1	L1	50	L7	NEC-1
201	MECHANICAL ROOM		P1	L4	20	L7	NEC-1
202	FIRE SPRINKLER		P1	L4	20	L7	NEC-1
203	ELECTRICAL		P1	L4	20	L7	NEC-1
204	COMMUNICATIONS		P5	L1	30	L7	NEC-1
205	NOT USED						
206	MELT POUR	E1, E2	P2,P6	L5, L6	50	L9	NEC-2
207	DRYING OVEN	E4	P2,P6	L5	50	L9	NEC-2
208	FORMULATION STILLS	E5, E6	P2,P6	L5	50	L9	NEC-2
209	DRYING OVEN	E7	P2,P6	L5	50	L9	NEC-2
210	BP MIXER	E8	P2,P6	L5	50	L9	NEC-2
211	ROTARY PRESS	E10	P2,P6	L5	50	L9	NEC-2
212	X-RAY	E11	P2,P6	L5	50	L9	NEC-2
213	TEHNEY OVEN	E12	P2,P6	L5	50	L9	NEC-2
214	ASSEMBLY		P2,P6	L5	50	L9	NEC-2
215	GRUENBERG OVEN ROOM 1	E13, E14	P2,P6	L5	50	L9	NEC-2
215A	UTILITY ROOM	E23,E24	P1	L4	20	L7	NEC-1
216	INSPECTION		P2,P6	L5	50	L9	NEC-2
217	GRUENBERG OVEN ROOM 2	E15, E16	P2,P6	L5	50	L9	NEC-2
218	SHOP ROOM		P2,P6	L5	50	L9	NEC-2
219	CONDITIONING OVEN	E17	P2,P6	L5	50	L9	NEC-2
219A	UTILITY ROOM	E22	P1	L4	20	L7	NEC-1
220	CONTROL ROOM FOR RM 211		P4		50	L7	NEC-1
221	CONTROL ROOM FOR RM 210		P4		50	L7	NEC-1
222	CONTAMINATED WASTEWATER TANK			L5	20	L9	NEC-2
	MACHINING						
	ENCLOSED WALKWAY		P1	L3	20	L7	NEC-1
300	CONTROL ROOM		P4		50	L7	NEC-1
301	MACHINE ROOM 1	E18	P2	L5	50	L9	NEC-2
302	MACHINE ROOM 2	E19	P2	L5	50	L9	NEC-2
303-313	NOT USED						
314	CONTROL ROOM		P4		50	L7	NEC-1
	MAGAZINE						
	ENCLOSED WALKWAY			L3	20	L7	NEC-1
400	STORAGE			L5	20	L9	NEC-2
401	STORAGE			L5	20	L9	NEC-2
402	STORAGE			L5	20	L9	NEC-2
403	STORAGE			L5	20	L9	NEC-2

(SEE EQUIPMENT, POWER, LIGHTING, AND NEC NOTES FOLLOWING CHART) E = EQUIPMENT NOTE, P = POWER NOTE, L = LIGHTING NOTE, NEC = NEC HAZARD NOTE

	EQUIPMENT NOTES
E1	Provide power for Oven and associated controls per manufacturer's recomendations.
E2	Provide power for the Two Kettles and associated controls per manufacturer's recomendations.
E4	Provide power for Drying Oven.
E5	Provide power for Holston Still, and Vent Hood, and associated controls per manufacturer's recomendations.
E6	Provide power for Holston Still, and Vent Hood, and associated controls per manufacturer's recomendations.
E7	Provide power for Drying Oven.
E8	Provide power for BP Mixer.
E10	Provide power for Oven.
E11	Provide power for XRAY Machine.
E12	Provide power for Tenney Oven and associated controls per manufacturer's recomendations. (230V, 3-phase,
E13	Provide power for Gruenberg Ovenand associated controls per manufacturer's recomendations. (208V, 3-phase,
E14	Provide power for Gruenberg Oven and associated controls per manufacturer's recomendations. (208V, 3-phase,
E15	Provide power for Gruenberg Oven and associated controls per manufacturer's recomendations. (208V, 3-phase,
E16	Provide power for Gruenberg Oven and associated controls per manufacturer's recomendations. (208V, 3-phase,
E17	Provide power Conditioning Oven.
E18	Provide power for CNC Lathe (230v, 7-1/2HP).
E19	Provide power for Drill Press.
E20	Provide power for Washing Machine.
E21	Provide power for Clothes Dryer.
E22	Provide power for external oil heater serving curing oven in room 219.
E23	Provide power for external cooling unit serving one Gruenberg Oven in room 215.
E24	Provide power for external air compressor serving ovens. (30 HP, 480V, 3PH w/ on board dryer @ 120V, 20A)
	POWER NOTES
P1	Provide 120v convenience receptacles. Receptacles shall be installed so that no point measured horizontally along the floor line in any wall space is more than 6 feet from a receptacle outlet.
P2	Provide a minimum of (4) explosionproof 120v GFCI receptacles on 1 circuit. Location of receptacles shall be coordinated with the Contracting Officer Representative.
P3	Provide a minimum of (3) 120v GFCI receptacles. Location of receptacles shall be coordinated with the Contracting Officer Representative.
P4	Provide a minimum of ten (10) 120v receptacles on 3 circuits. Location of receptacles shall be coordinated with the contracting officer's representative.
P5	Provide (2) 120v, single-phase 20 amp circuits serving 2 quad type receptacles for the telephone backboard. Provide a (3) 120v receptacles on one circuit on the other three walls. (One receptacle per wall.)
P6	Provide a minimum of (2) explosionproof 120v receptacles above workbench on 1 circuit. Location of receptacles shall be coordinated with the Contracting Officer Representative.
	LIGHTING NOTES
L1	Provide recessed mounted fluorescent fixtures with prismatic lens.
L2	Provide recessed mounted fluorescent fixtures with parabolic lens.
L3	Provide pendant mounted compact fluorescent industrial dome weatherproof fixtures.
L4	Provide pendant mounted industrial fluorescent fixtures.
L5	Provide pendant mounted explosion proof industrial fluorescent fixtures.
L6	Provide supplementary pendant mounted explosion proof industrial directional fixtures aimed at kettles.
L7	Lighting to be controlled by one wall switch at each door.
L8	Provide surface mounted fluorescent fixtures. (Gasketed for moisture protection.)
L9	Lighting to be controlled by one explosionproof rated wall switch at each door.
L10	Lighting in the restrooms shall be controlled by motion sensors.
	NEC HAZARD NOTES
NEC-1	Room is a non-hazardous area.
NEC-2	All equipment installed in this room shall be rated for Class 1 and Class 2, Division 1 Area and meet the requirements of DA PAM 385-64 Ammunition and Explosives Safety Standards.

ELECTRICAL ROOM BY ROOM REQUIREMENTS (CHART #2)

(SEE MISCELLANEOUS NOTES FOLLOWING CHART)		MISCELLANEOUS					
		Conductive Flooring	Ground Bars	Hazard Warning	Empty Conduits	BACK-UP POWER	
	ADMINISTRATION						
ROOM #	**SPACE**						
100	LOBBY						
101	OPEN PLAN FOR OFFICES						
102	BREAK ROOM						
103	CONFERENCE ROOM						
104	MEN'S RESTROOMS						
105	WOMEN'S RESTROOMS						
106	JANITORS CLOSET						
107	ELECTRICAL						
108	COMMUNICATIONS						
	PROCESSING						
	ENCLOSED WALKWAY						
200	WASHING & DRYING						
201	MECHANICAL ROOM						
202	FIRE SPRINKLER						
203	ELECTRICAL						
204	COMMUNICATIONS						
205	NOT USED						
206	MELT POUR	M1	M2	M3			
207	DRYING OVEN	M1	M2	M3		M5	
208	FORMULATION STILLS	M1	M2	M3			
209	DRYING OVEN	M1	M2	M3		M5	
210	BP MIXER	M1	M2	M3	M4		
211	ROTARY PRESS	M1	M2	M3	M4		
212	X-RAY	M1	M2	M3			
213	TEHNEY OVEN	M1	M2	M3		M5	
214	ASSEMBLY	M1	M2	M3			
215	GRUENBERG OVEN ROOM 1	M1	M2	M3		M5	
215A	UTILITY ROOM						
216	INSPECTION	M1	M2	M3			
217	GRUENBERG OVEN ROOM 2	M1	M2	M3		M5	
218	SHOP ROOM						
219	CONDITIONING OVEN	M1	M2	M3		M5	
219A	UTILITY ROOM						
220	CONTROL ROOM			M3			
221	CONTROL ROOM			M3			
222	CONTAMINATED WASTEWATER TANK						
	MACHINING						
	ENCLOSED WALKWAY						
300	CONTROL ROOM			M3			
301	MACHINE ROOM 1				M4		
302	MACHINE ROOM 2				M4		
303-313	NOT USED						
314	CONTROL ROOM			M3			
	MAGAZINE						
	ENCLOSED WALKWAY						
400	STORAGE						
401	STORAGE						
402	STORAGE						
403	STORAGE						

MISCELLANEOUS NOTES

M1	PROVIDE CONDUCTIVE FLOORING.
M2	PROVIDE GROUND BARS.
M3	PROVIDE CONTROL SWITCH FOR HAZARD WARNING LIGHT SYSTEM.
M4	PROVIDE TWO (2) 2" CONDUITS WITH PULL WIRES FROM THIS ROOM TO ASSOCIATED CONTROL ROOM. CONDUIT END POINTS SHALL BE COORDINATED WITH THE CONTRACTING OFFICER'S
M5	PROVIDE BACK-UP POWER VIA GENERATOR FOR PROCESSING EQUIPMENT AND LIGHTS IN THIS ROOM.

COMMUNICATIONS ROOM BY ROOM REQUIREMENTS (CHART #3)

(SEE COMMUNICATIONS NOTES FOLLOWING CHART)		COMMUNICATIONS					
		PHONE	Remote Camera	PUBLIC ADDRESS			
	ADMINISTRATION						
ROOM #	**SPACE**						
100	LOBBY						
101	OPEN PLAN FOR OFFICES	C1,C5		C8			
102	BREAK ROOM	C1		C8			
103	CONFERENCE ROOM	C3		C8			
104	MEN'S RESTROOMS			C8			
105	WOMEN'S RESTROOMS			C8			
106	JANITORS CLOSET						
107	ELECTRICAL			C8			
108	COMMUNICATIONS			C8			
	PROCESSING						
	ENCLOSED WALKWAY	C6		C8			
200	WASHING & DRYING			C8			
201	MECHANICAL ROOM			C8			
202	FIRE SPRINKLER			C8			
203	ELECTRICAL			C8			
204	COMMUNICATIONS			C8			
205	NOT USED						
206	MELT POUR	C2		C8			
207	DRYING OVEN			C8			
208	FORMULATION STILLS			C8			
209	DRYING OVEN (FUTURE USE)			C8			
210	BP MIXER		C4	C8			
211	INERT CASTING		C4	C8			
212	X-RAY FUTURE USE			C8			
213	TEHNEY OVEN			C8			
214	ASSEMBLY			C8			
215	GRUENBERG OVEN ROOM 1			C8			
216	INSPECTION			C8			
217	GRUENBERG OVEN ROOM 2			C8			
218	SHOP ROOM			C8			
219	CONDITIONING OVEN			C8			
220	CONTROL ROOM	C1		C8			
221	CONTROL ROOM	C1		C8			
222	CONTAMINATED WASTEWATER TANK						
	MACHINING						
	ENCLOSED WALKWAY	C6		C8			
300	CONTROL ROOM	C1		C8			
301	MACHINE ROOM 1		C4	C8			
302	MACHINE ROOM 2		C4	C8			
303-313	NOT USED						
314	CONTROL ROOM	C1		C8			
	MAGAZINE						
	ENCLOSED WALKWAY	C6,C7		C8			
400	STORAGE			C8			
401	STORAGE			C8			
402	STORAGE			C8			
403	STORAGE			C8			

	COMMUNICATION NOTES
C1	PROVIDE DUAL DATA RJ-45 OUTLETS CATEGORY 6 ON EACH WALL OF ROOM.
C2	PROVIDE WALL-MOUNTED EXPLOSION PROOF PHONE OUTLET ON BLOW OUT WALL ON THE LEFT SIDE OF THE DOORS AT ENTRANCE TO ROOM.
C3	PROVIDE DUAL DATA RJ-45 OUTLETS CATEGORY 6 ON EACH WALL OF CONFERENCE ROOM.
C4	PROVIDE TWO-STRAND MULTI-MODE FIBER OPTIC CABLE FOR CAMERA LOCATION 18 INCHES BELOW CEILING IN THIS ROOM, AND TERMINATE IN ASSOCIATED CONTROL ROOM.
C5	PROVIDE DUAL DATA RJ-45 OUTLETS CATEGORY 6 FOR EACH WORSTATION IN SYSTEMS FURNITURE.
C6	PROVIDE WALL-MOUNTED PHONES PER PART 8 OF SOW.
C7	PROVIDE WALL-MOUNTED PHONE OUTSIDE MAGAZINE PER PART 8 OF SOW.
C8	PROVIDE PUBLIC ADDRESS SPEAKER COVERAGE IN THIS SPACE PER PART 8 OF SOW.

MECHANICAL ROOM BY ROOM REQUIREMENTS

PROCESSING

ROOM #	SPACE	EQUIPMENT	HOIST (Note 1)	DRAIN TO SANITARY	DRAIN TO CONTAMINATED WASTE SYSTEM	EYEWASH / SHOWER (Note 9)	PROCESS WATER	COMPRESSED AIR (120 PSI)	STEAM CLEANING STATION	PROCESS STEAM TAPS (15 PSI)	VACUUM	HEAT EXCHANGER (STEAM TO HOT WATER)	SPRINKLER CLASSIFICATION	DELUGE SPRINKLER	MISC
	ENCLOSED WALKWAY WITH WEATHER PANELS														
	LOADING DOCK														
200	WASHING & DRYING			spare 4" San. connection	Floor Drain, Washer Drain, Washer 2nd Containment Drain, Janitors Sink Drain				1				Ordinary Haz 1		Note 7
201	MECHANICAL ROOM			Floor Drains			1	1					Ordinary Haz 2		
202	FIRE SPRINKLER			Floor Drains				1					Light Hazard		
203	ELECTRICAL			Floor Drains									Light Hazard		
204	COMMUNICATIONS			Floor Drains									Light Hazard		
205	NOT USED														
206	MELT/POUR	General for room	1/2 Ton		Trench Drain	1	1	2	2				Extra Hazard 2		
		Conditioning Oven (GFE - Note 8)						2		1@15psi		500,000 btu/hr, 220F water supply		Yes	Note 10
		Heating Kettle (GFE)						2		3@15psi 3@10psi	1	150,000 btu/hr, 220F water supply		Yes	Note 10
		Heating Kettle (GFE)						2		3@15psi 3@10psi	1	150,000 btu/hr, 220F water supply		Yes	Note 10
207	DRYING OVEN	General for room			Trench Drain	1	1	2	1	1@15psi	2		Extra Hazard 2		
		Drying Oven #1 (GFE)										150,000 btu/hr, 150F water supply		Yes	Note 10
208	HOLSTEN STILLS	General for room			Trench Drain	1	1	2	1		2		Extra Hazard 2		
		Hostein Still (GFE)						1		1@10psi		150,000 btu/hr, 212F water supply		Yes	Note 3, Note 10
		2nd Still (future)						1		1@10psi		150,000 btu/hr, 212F water supply		Yes	Note 4, Note 10
209	CURING OVEN	General for room			Trench Drain	1	1	2	1	1@15psi	2		Extra Hazard 2		
		Oven (GFE)										150,000 btu/hr, 150F water supply		Yes	Note 10
210	BP MIXER	General for room	1 Ton		Trench Drain	1	1	2	1	1@15psi	2		Extra Hazard 2		
		APV Vertical Mixer (GFE)										150,000 btu/hr, 200F water supply		Yes	Note 10
211	ROTARY PRESS	General for room			Trench Drain	1	1	2	1	1@15psi	2	150,000 btu/hr, 220F water supply	Extra Hazard 2		
212	X-RAY	General for room			Trench Drain	1	1	2	1	1@15psi	2		Extra Hazard 2		
213	TENNEY OVEN	General for room			Trench Drain	1	1	1	1	1@15psi	2		Extra Hazard 2		
		Tenney Oven (GFE)						1@20-60psi , Note 11						Yes	Note 2, Note 10
214	ASSEMBLY	General for room			Trench Drain	1	1	2	1	1@15psi	2		Extra Hazard 2		
215	GRUENBERG OVEN ROOM 1	General for room			Trench Drain	1	1	1	1	1@15psi	2		Extra Hazard 2		
		Gruenberg Oven (GFE)						1@50-100 psi, Note 11						Yes	Note 6, Note 10
		Gruenberg Oven (GFE)						1@50-100 psi, Note 11						Yes	Note 10
215A	UTILITY	General for room											Light Hazard		Note 6
216	INSPECTION	General for room			Trench Drain	1	1	2	1	1@15psi	2		Extra Hazard 2		
217	GRUENBERG OVEN ROOM 2	General for room			Trench Drain	1	1	1	1	1@15psi	2		Extra Hazard 2		
		Gruenberg Oven (GFE)						1@50-100 psi, Note 11						Yes	Note 10
		Gruenberg Oven (GFE)						1@50-100 psi, Note 11						Yes	Note 10
218	SHOP ROOM	General for room		Floor Drains			1	2	1				Extra Hazard 2		
219	CONDITIONING OVEN	General for room			Trench Drain	1	1	2	1	1@15psi	2		Extra Hazard 2		
		Curing Oven (GFE)												Yes	Note 5
219A	UTILITY	General for room											Ordinary Haz 2		Note 5
220	CONTROL ROOM (for Room 211)							2					Light Hazard		
221	CONTROL ROOM (for Room 210)							2					Light Hazard		
222	CONTAMINATED WASTE WATER TANK						1	1	1				Extra Hazard 2		

MECHANICAL ROOM BY ROOM REQUIREMENTS

ADMINISTRATION

ROOM #	SPACE			DRAIN TO SANITARY	Domestic Hot Water	Domestic Cold Water						SPRINKLER CLASSIFICATION		MISC
	ENCLOSED WALKWAY WITH WEATHER PANELS													
100	LOBBY											Light Hazard		
101	OPEN PLAN FOR OFFICES											Light Hazard		
102	BREAK ROOM			Sink	Sink	Sink						Light Hazard		
103	CONFERENCE ROOM											Light Hazard		
104	MEN'S RESTROOM			Floor Drains, Sinks, Toilets, Shower	Sinks , Shower	Sinks, Toilets, Shower						Light Hazard		
105	WOMEN'S RESTROOM			Floor Drains, Sinks, Toilets, Shower, Water Fountain	Sinks , Shower	Sinks, Toilets, Shower, Water Fountain (outside restrooms)						Light Hazard		
106	JANITORS CLOSET			Floor Drain, Janitors Sink	Janitors Sink	Janitors Sink						Light Hazard		
107	ELECTRICAL											Light Hazard		
108	COMMUNICATIONS											Light Hazard		

MACHINING

ROOM #	SPACE	EQUIPMENT	HOIST (Note 1)	DRAIN TO SANITARY	DRAIN TO CONTAMINATED WASTE SYSTEM	EYEWASH / SHOWER (Note 9)	PROCESS WATER	COMPRESSED AIR (120 PSI)	STEAM CLEANING STATION	PROCESS STEAM TAPS (15 PSI)	VACUUM	HEAT EXCHANGER (STEAM TO HOT WATER)	SPRINKLER CLASSIFICATION	DELUGE SPRINKLER	MISC
	INTERIOR WALKWAY			Floor Drains									Extra Hazard 2		
300	CONTROL ROOM							2					Light Hazard		
301	MACHINING ROOM 1	CNC Lathe	1/4 TON		Trench Drain	1	1	2	1		2		Extra Hazard 2	Yes	
302	MACHINING ROOM 2	Drill Press	1/4 TON		Trench Drain	1	1	2	1		2		Extra Hazard 2	Yes	
303-313	NOT USED														
314	CONTROL ROOM							2					Light Hazard		

MAGAZINE

ROOM #	SPACE	EQUIPMENT	HOIST	DRAIN TO SANITARY	DRAIN TO CONTAMINATED WASTE SYSTEM	EYEWASH / SHOWER (Note 9)	PROCESS WATER	COMPRESSED AIR (120 PSI)	STEAM CLEANING STATION	PROCESS STEAM TAPS (15 PSI)	VACUUM	HEAT EXCHANGER (STEAM TO HOT WATER)	SPRINKLER CLASSIFICATION	DELUGE SPRINKLER	MISC
	ENCLOSED WALKWAY														
400	STORAGE														
401	STORAGE														
402	STORAGE														
403	STORAGE														

NOTES	
Note 1	Area of coverage in rooms shall be in accordance with the Architectual room sketches
Note 2	Provide two 4 inch exhaust vents to the outside for the Tenney Oven
Note 3	Provide exhaust penetration for fume hood (2345cfm). Contractor to verify required penetrationn size/configuration from existing equipment
Note 4	Provide same penetration configuration as per Note 3, but cap penetration for future equipment installation
Note 5	The curing oven in Room 219 has an external oil heater that will be located in Room 219A. Provide penetrations for the oil heating lines between the rooms (2 lines up to 4 inch diameter).
Note 6	One Gruenberg Oven in Room 215 has an external cooling unit that will be located in Room 215A. Provide penetrations for the refrigerant lines between rooms (2 lines up to 2 inch diameter)
Note 7	Domestic hot and cold water shall be provided to the clothes washer and janitors sink
Note 8	GFE = Government Furnished Equipment
Note 9	All Emergency eyewash showers shall drain to the Contaminated Waste Collection System
Note 10	The process services supporting this government furnished equipment shall be co-located on a wall near the equipment. The layout and configuration of the connections shall be submitted for approval.
Note 11	Compressed air for these supply points shall be provided from the dedicated Oven Compressed Air System

ATTACHMENT B

PICATINNY ARSENAL INSTALLATION DESIGN GUIDE

INSTALLATION DESIGN GUIDE

Picatinny Arsenal

NEW JERSEY

STV/LYON ASSOCIATES

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2 December 1994
2284-8863-10

Department of the Army
New York District, Corps of Engineers
Jacob K. Javits Federal Building
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New York, New York 10278-0090

Attention: Mr. Zia Mian, PE, Project Manager
CENAN-EN-MJ

Reference: Final Submittal of Installation Design Guide
Picatinny Arsenal, New Jersey
Contract No. DACA 51-91-D-0029, D.O. #10

Gentlemen:

We are pleased to forward to you, herewith, the final Installation Design Guide for Picatinny Arsenal. This submittal incorporates comments received from the installation.

Also, in accordance with the scope of services, additional copies of this final IDG have been forwarded directly to Picatinny Arsenal.

It was a pleasure working with the New York District, Corps of Engineers and Picatinny Arsenal on this project. We hope to provide you with our services again in the future.

Very truly yours,

STV/LYON ASSOCIATES

Gary Anderson

Gary D. Anderson, AIA, AICP
Senior Associate

GDA/NA/sem
Enclosure As Noted

cc: Mr. Vinod Kapoor, Picatinny Arsenal, NJ

Picatinny Arsenal INSTALLATION DESIGN GUIDE

PAGE

Executive Summary

Introduction E.S.1
Visual Zones and Thematic Areas E.S.2
Design Guidelines E.S.5

I. Background

I.1 Introduction

I.1-1 Goals and Objectives I.1.1
I.1-2 The IDG User I.1.3
I.1-3 Organization and Format I.1.3

I.2 Installation History

I.2-1 Mission I.2.1
I.2-2 History I.2.1
I.2-3 Historic Sites and Structures I.2.3

I.3 Context and Analysis

I.3-1 Design Process I.3.1
I.3-2 Regional Setting I.3.2
I.3-3 Environmental Setting I.3.3
I.3-4 Development Patterns I.3.6

I.4 Design Principles

I.4-1 Design Goals I.4.1
I.4-2 Conceptual Framework I.4.3

II. Visual Zones and Thematic Areas

II.1 Visual Zone I: THE GREEN

II.1-1 Location and Character II.1.1
II.1-2 Thematic Areas II.1.2
II.1-3 Man-made Green II.1.2
II.1-4 Natural Green II.1.4

II.2 Visual Zone II: DOWNTOWN

II.2-1 Location and Character II.2.1
II.2-2 Thematic Areas II.2.2
II.2-3 Urban Core II.2.3
II.2-4 Transition / Park II.2.9

PAGE

II.3 Visual Zone III: PM ROW

II.3-1 Location and Character *II.3.1*
II.3-2 Thematic Areas *II.3.1*
II.3-3 Linear Campus *II.3.2*
II.3-4 Rural Area *II.3.7*

II.4 Visual Zone IV: NAVY HILL

II.4-1 Location and Character *II.4.1*
II.4-2 Thematic Areas *II.4.1*
II.4-3 Community *II.4.3*
II.4-4 Residential *II.4.7*
II.4-5 Campus/Educational *II.4.9*
II.4-6 Urban Warehouse District *II.4.12*
II.4-7 Industrial Variety *II.4.15*

II.5 Visual Zone V: THE TRACTS

II.5-1 Location and Character *II.5.1*
II.5-2 Thematic Areas *II.5.2*
II.5-3 Industrial/Campus *II.5.2*
II.5-4 Rural Area *II.5.4*

II.6 Visual Zone VI: THE HIGHLANDS

II.6-1 Location and Character *II.6.1*
II.6-2 Thematic Areas *II.6.1*
II.6-3 Village Area *II.6.2*

III. Design Guidelines

III.1 Buildings

III.1-1 Building Types *III.1.1*
III.1-2 Site Plan Types *III.1.14*
III.1-3 Plan Types *III.1.18*
III.1-4 Massing Types *III.1.19*
III.1-5 Roof Types *III.1.21*
III.1-6 Elevation Types *III.1.22*
III.1-7 Fenestration *III.1.24*

III.2 Open Space/Landscape

III.2-1 Public Open Space *III.2.1*
III.2-2 Road System *III.2.3*
III.2-3 Parking *III.2.11*
III.2-4 Planting *III.2.14*
III.2-5 Signage *III.2.29*
III.2-6 Lighting and Utilities *III.2.32*
III.2-7 Site Furnishings *III.2.36*

ATT 13-4

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U.S. Army Corps of Engineers
New York District

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Executive Summary

AM13-6

Executive Summary

INTRODUCTION

Purpose

The purpose of this Installation Design Guide (IDG) is to provide design guidance for improving the quality of the visual and perceptual environment of Picatinny Arsenal. These guidelines for future development and improvements to the existing facilities at the installation are intended to be used by outside design professionals and the Picatinny Arsenal Installation Planning Board, as well as installation planning and design personnel. The IDG provides design guidance for informed decision making, both for the siting and design of new facilities and for upgrading and improving existing facilities.

The appropriate implementation of the IDG will result in the conservation and enhancement of the positive visual qualities that characterize Picatinny Arsenal. The preservation and enhancement of three major visual and cultural assets of Picatinny Arsenal have shaped the development of the guidelines. These are: the outstanding natural features – landform, drainage patterns, and vegetation; the environmentally responsive development patterns; and the distinctive character of the traditional architecture.

Process

The Installation Design Guide applies accepted design concepts and principles to the existing visual environment at Picatinny Arsenal. The first step in the process is the documentation and analysis of existing conditions at the installation, including the historical and regional context; the natural characteristics of the land; and the built elements, including roads, buildings and other structures, and site elements. The individual physical and visual elements and the existing patterns of development which make up the visual character of Picatinny were identified and categorized. Existing and proposed patterns of land use and circulation networks were also evaluated.

Building 112

Distinctive visual environments, designated as "Visual Zones" and "Thematic Areas", were identified and classified based on the unique characteristics of Picatinny Arsenal which were revealed during the analysis of existing conditions. These visual environment classifications provide the framework for the general recommendations and for application of the design guidelines. The IDG includes recommendations to guide future development

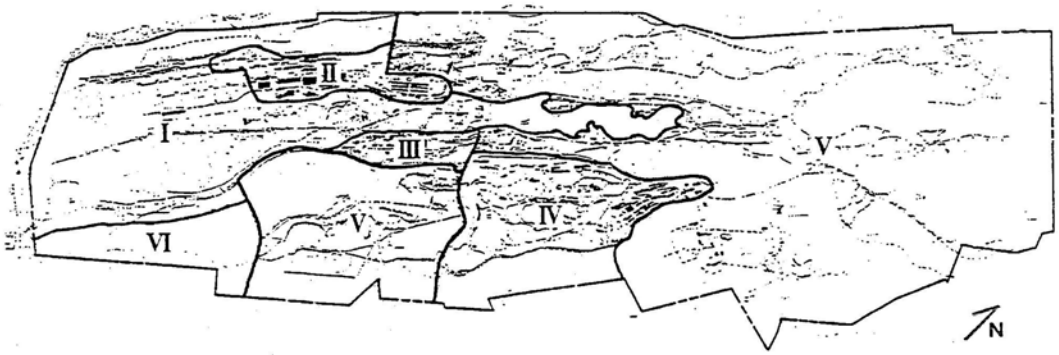
A#13-7

and addresses aesthetic treatment within each of the visual zones and thematic areas. Design guidelines were developed to provide a specific palette for treatment of each individual element that significantly impacts the visual environment.

VISUAL ZONES AND THEMATIC AREAS

The six visual zones are areas that share significant common visual characteristics, such as architectural elements, building types, site plan types, landscape treatments, and natural features, which contribute to a distinctive visual image. Each visual zone may encompass several different functional land uses.

Further visual environment subdivisions, called thematic areas, were identified within each of the visual zones. The thematic areas are defined by special site or architectural details that may be related to land use or natural context, and that serve to distinguish them from other parts of the same visual zone.



Legend

I. The Green
II. Downtown
III. PM Row
IV. Navy Hill
V. The Tracts
VI. The Highlands

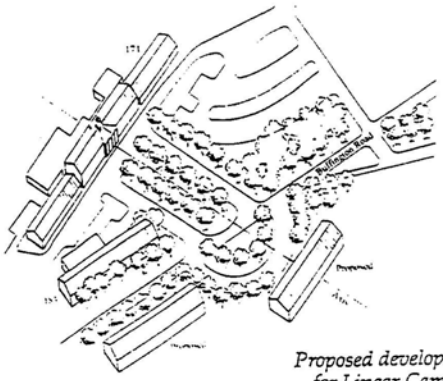
AM13-8

The six visual zones and their respective thematic areas are outlined below:

Visual Zones	*Thematic Areas*
I. The Green	Man-Made Green Natural Green
II. Downtown	Urban Core Transition/Park
III. PM Row	Linear Campus Rural Area
IV. Navy Hill	Community Residential Educational/Campus Urban Warehouse District Industrial Variety
V. The Tracts	Industrial/Campus Rural Area
VI. The Highlands	Village Area

Visual assets and liabilities are identified and described for each of the thematic areas and visual zones. General guidelines are presented that will promote architectural compatibility, provide appropriate design treatments, and correct spatial deficiencies for various visual elements, such as streets, parking areas, and open space, within each visual zone. Design considerations for the siting of future facilities within each zone or thematic area are also outlined.

Recommendations for reinforcing positive visual elements and for mitigating negative conditions are provided for each thematic area. The recommendations are based on development concepts for each urbanized area which provide a vision of the desired image that can be achieved through the incremental implementation of the design guidelines. Examples of specific recommendations for strengthening and enhancing positive visual elements include: reinforce the edge of the "Natural Green" thematic area through siting of future development; maintain the rural character of the "Industrial Variety" thematic area; reinforce the campus character of the PM Row visual zone through landscape and future devopment; extend and embellish the installation pedestrian system.



Proposed development for Linear Campus - PM Row

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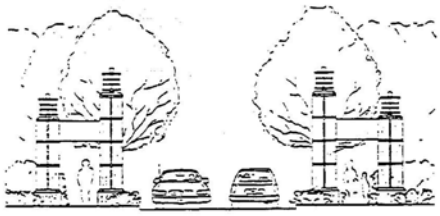
Examples of recommendations for mitigating negative elements are: introduce a planting strip to buffer the parking lot along Buffington Road; create a sense of arrival with landscape features

Buffington Road (proposed)



Example of Entrance to Residential Area

View of the Community Area

Proposed boulevard treatment

at the entrance to the residential area; relocate the NCO Club across the water reservoir near building 3201; introduce trees and sidewalks along boulevards in the Downtown Visual Zone; avoid the proliferation of portable buildings by clustering them in the 3700 Area.

DESIGN GUIDELINES

The Design Guidelines are the heart of the IDG. The guidelines provide detailed directions and standards for an array of design decisions. They are organized according to the two major categories of elements that comprise the visual environment: Buildings and Open Space/ Landscape. The topics covered in each category are outlined below:

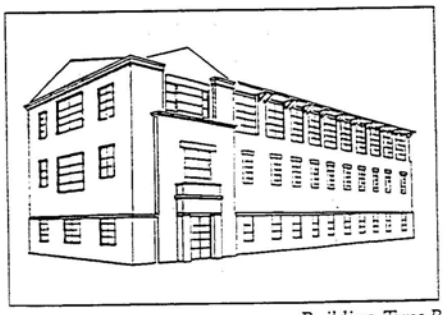
Buildings	*Open Space/Landscape*
Building Types	Public Open space
Site Plan Types	Road System
Plan Types	Parking
Massing Types	Planting
Roof Types	Signage
Elevation Types	Lighting and Utilities
Fenestration Types	Site Furnishings

Buildings

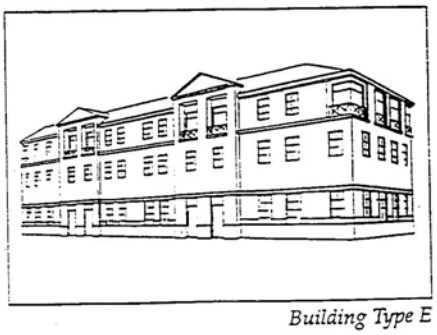
Buildings are a dominant feature of the visual environment. The size of a building, its material of construction, exterior finishes, arrangement on the land, and relationship to other buildings, open space and roads play a major role in defining the character or "essence" of a place. For this reason, considerable thought and attention should be given to the siting and architectural character of every building that is constructed or modified. Building design and siting decisions can be developed and evaluated using the following guidelines:

BUILDING TYPES

Guidelines for architectural treatment are based on the analysis of existing structures and their uses. The guidelines are intended to provide general direction for informed decisions in a variety of situations rather than architectural design solutions for specific buildings. Ten representative building types have been classified and described in the IDG. Each of the building types represents an acceptable palette of architectural vocabulary that should be used



Building Type B



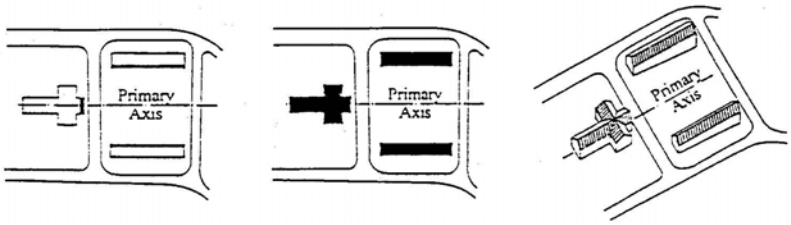
Building Type E

AT13-11

in designated areas, both for new design and when any modification to the exterior of existing buildings is implemented. Two matrices specify where each building type and architectural element may be appropriately used throughout each visual zone.

SITE PLAN TYPES

Analysis of existing development patterns at Picatinny Arsenal revealed five typical site plan types. This section of the IDG provides guidance as to the appropriate arrangement and spacing of various buildings within each visual zone. The appropriate consideration of this design element will assure that future development, including infill construction, will fit harmoniously within the existing development patterns.



Formal/Axial Site Plan Type

PLAN TYPES

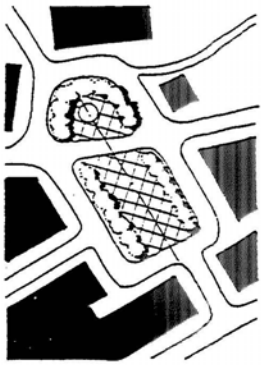
Two plan types, Linear and Central, are presented to guide the spatial organization and geometry of building plans. This design element is used to assure that each building relates appropriately to its context, to adjacent buildings, and as a definer of open space.

MASSING TYPES, ROOF TYPES, ELEVATION TYPES, FENESTRATION TYPES

Various architectural elements existing at Picatinny Arsenal have been classified, described and illustrated with recommendations for their appropriate use within each visual zone and thematic area.

Open Space/Landscape

All other elements of the exterior visual environment other than buildings and their arrangement on the land are included in the Open Space/Landscape section of the design guidelines. In general, the Open Space/Landscape guidelines are more generic in terms of the individual visual zones. Specific considerations or applications of the design guideline for a particular visual zone or thematic area — or for a specific element — are included as appropriate. Descriptions of existing conditions and design objectives are presented for each of the individual elements of the Open Space/Landscape guidelines, as summarized below:



Proposed public square in Navy Hill Visual Zone

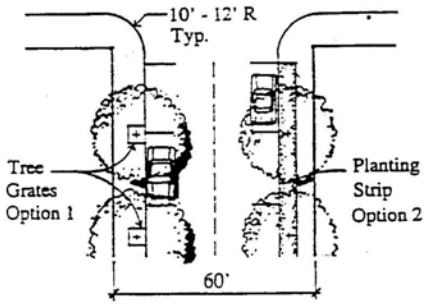
ATT13-12

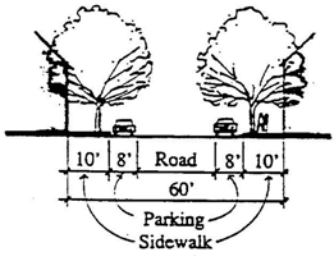
PUBLIC OPEN SPACE

Design guidelines have been provided for six public open space types: Park, Plaza, Square, Courtyard, Ceremonial Gathering Space, and Residential Rear Yard.

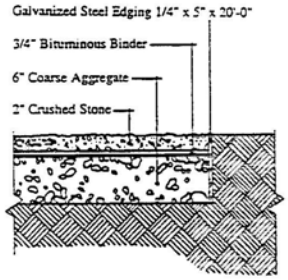
ROAD SYSTEM

The roads at Picatinny Arsenal have been classified into three hierarchical categories – Primary, Secondary and Tertiary – and three categories based on visual character – Rural, Suburban, and Urban. Matrices relate the road types to specific design treatments within each of the visual zones. Typical sections with edge treatments for each road type and recommendations for intersections are features of this section.





Main street/street



Alternate paving material

PARKING

Guidelines for parking areas include recommendations for paving materials, use of planting strips and islands to define and buffer parking lots, layout alternatives, and parking access. Standards and dimensions for parking facilities and landscape materials are specified.

PLANTING

General design recommendations for the use of plantings for various functional and aesthetic purposes are outlined. A plant palette is provided that describes the distinguishing features, functional uses, and cultural requirements for the trees, shrubs, and groundcovers recommended for Picatinny Arsenal. Installation and maintenance specifications for plant materials are also included.

SIGNAGE

Seven types of signs have been identified for use at Picatinny Arsenal. Recommendations for standardizing systems of signs and their locations is summarized in this section.

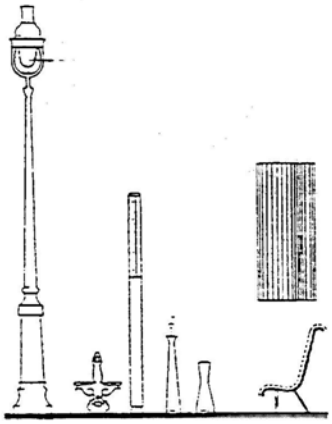
A#13-13

LIGHTING AND UTILITIES

This section includes general guidelines for types of lighting, the selection of outdoor lighting fixtures and poles, and recommendations for reducing the visual impacts of utility structures.

SITE FURNISHINGS

General design considerations regarding site furnishings are given along with detailed design criteria to guide the selection of benches, fences and walls, picnic area furnishings, and retaining walls.



In conclusion, an excellent quality visual environment can be achieved and maintained at Picatinny Arsenal through the application of basic design principles and the design guidelines within the existing framework, as characterized by the visual zones and thematic areas.

ATI3-1 4

I. Background ANALYSIS AND DESIGN PRINCIPLES

I.1 INTRODUCTION

I.1-1 GOALS AND OBJECTIVES

The Picatinny Arsenal Installation Design Guide (IDG) provides guidance for improving the quality of the visual environment of the installation. It provides design guidelines for future development and for ongoing maintenance practices at the installation. The scope of the IDG focuses on the general idea and principle of design, which is the order or arrangement of the components and details of something in accordance with a plan. The something in the IDG is the visual environment made up of the natural and man-made elements we see with our eyes as the installation. The IDG addresses five key environmental factors which provide installation-wide visual unity. The five factors are as follows:

- natural assets,
- relationships of built and natural environments,
- organizing elements, including circulation and open space,
- architectural character, and
- hierarchy in site elements.

The unique environmental quality of Picatinny Arsenal is characteristic of the federally designated Highlands region, within which the Arsenal lies. Narrow mountain ridges and long valleys with dense vegetation typically describe the Highlands region. These attributes have been characteristic of this region since before it was settled by early American pioneers. Congress supports an extensive study into maintaining and preserving the qualities of this unique environment. Picatinny Arsenal lies within one of the long valleys in the region and, even today, exhibits many natural qualities characteristic of the Highlands region.

The image of Picatinny Arsenal is clearly established by existing design features and by the Arsenal's unique natural environment. There are two key groupings of elements titled site and building which typically determine the physical character of an installation.

AH13-15

Site Elements

- Facades
- Street Width
- Street Furniture
- Lights
- Trees / Landscape
- Sidewalks
- Fences
- Street Signage

Building Elements

- Footprint (plan type)
- Massing
- Roofs
- Elevation & Structural Expression
- Fenestration (openings)

The Installation Design Guide professes quality design through careful thought and an understanding of the visual character of Picatinny Arsenal and what it can become. As a planning tool, the IDG is also used to improve the visual environment of Picatinny Arsenal in support of its functional aspects. There are four government documents along with the contract Scope of Services that provide the regulation, instruction and technical guidance that define the IDG for Picatinny Arsenal.

Regulation: AR 210-20: *Master Planning for Army Installations* (30 July 1993)

Instruction: *Master Planning Instructions* (9 July 1993)

Technical: DA Pamphlet 600-45: *Army Communities of Excellence, Guidelines for Community Excellence* (August 1991)

TM 5-803-5: *Installation Design* (1 March 1981)

Army Regulation (AR) 210-20 establishes the policies for and responsibilities to real property master planning at the installation level. The Installation Design Guide is an essential element of the long-range component of master planning. The IDG ensures that all real property maintenance improvements, renovation projects, and new construction for the installation complies with a cohesive set of exterior design guidelines.

The Army Communities of Excellence program charges the installation and installation command to pursue facilities excellence, an excellence plan for the community, excellence awareness and education, and facilities guidelines. The Installation Design Guide gives form to these principles.

The IDG promotes continuity in character and a positive image for the installation. The IDG recognizes the natural and man-made qualities that support this image. It is this positive image that gives a clear and logical impression of Picatinny Arsenal to visitors, employees, and area residents.

DA#13-16

I.1-2 THE IDG USER

The Installation Design Guide is a decision making tool and a working document. It addresses the implementation of long-range development goals and environmental conservation, and the improvement of functional relationships through land use planning. All capital improvement projects for major construction, minor construction and repair, and operations and maintenance are subject to the design guidelines of the IDG. Because of this, installation leaders and design professionals along with planning and design consultants will use the IDG as a framework for the visual standards of Picatinny Arsenal.

The IDG serves several types of users including: (1) installation leadership that is responsible for the comprehensive development of the Arsenal in response to mission demands, (2) Arsenal personnel who require design and construction guidance to ensure proper implementation of their projects, (3) design professionals who will reference the IDG for planning and design of capital improvement projects, and (4) engineering personnel at Picatinny Arsenal who must design and implement the exterior elements of real property operations and maintenance.

The following persons and organizations are specified as primary users of the Picatinny Arsenal Installation Design Guide:

- Installation Commander,
- Installation Planning Board,
- Safety, Surety and Environmental Office,
- Installation Support Activity, and
- Architectural, engineering and design consultants.

I.1-3 ORGANIZATION AND FORMAT

The IDG is organized into an Executive Summary and three primary chapters – I. Background, II. Visual Zones, and III. Design Guidelines. Each chapter is divided into sections and, as complexity warrants, subsections.

Chapter I: Background

Chapter I contains four sections with their respective subsections:

I.1 Introduction
I.2 Installation History
I.3 Context and Analysis
I.4 Design Principles

The first section primarily acquaints the reader with the IDG and its organization. The second and third sections include an overview of baseline planning considerations, the methodology and an

initial analysis of the installation. Section four describes the design principles and concepts addressing site plan and building form, open space and landscapes, visual zones, and thematic areas.

Chapter II: Visual Zones

Chapter II: Visual Zones provides a complete analysis of the six visual zones identified as the conceptual framework of the IDG in Section I.4: Design Principles. Thematic Areas are identified in each visual zone with an outline of their characteristics, assets, liabilities, and recommendations.

Chapter III: Design Guidelines

The third chapter on Design Guidelines contains specific design elements which create the kit-of-parts that is used to implement the principles of the IDG. The chapter consists of two sections. The first section presents specific guidelines for building elements. The second section addresses open space/landscape elements. These sections illustrate the components that make up the physical and visual character of Picatiny Arsenal.

Format

The evolutionary process of design and master planning provides flexibility that can respond to future needs and program changes. This IDG can be expanded or revised to conform with changing goals and conditions of the installation. The three-ring bound format and the use of sections and subsections will help simplify future expansions and revisions. In addition, the numbering system used for chapters, sections, subsections, and individual pages will also support future expansions or revisions of the IDG as well as ease the reader through references and cross-references.

The numbering structure for the narrative and pages of the IDG is represented as follows:

```
Chapter ──┐
          I. 2 - 1
Section ──┘   └── Subsection
```

The pagination closely follows the narrative numbering structure. Each page number reflects the chapter and section found on that page. Pagination is represented on the bottom of each page in the following format:

```
Chapter ──┐
          I. 1 . 4
Section ──┘   └── Page Number
```


A#13-18

I.2 INSTALLATION HISTORY

I.2-1 MISSION

The mission of the US Army Armament Research, Development and Engineering Center (ARDEC) located at Picatinny Arsenal is to maintain a strong technology base by conducting research and development as well as life cycle engineering for armament, munitions and systems for assigned materiel. The Center is to conduct development and product improvement, support production and fielding, and provide life cycle engineering support of armament systems including attendant fire control, conventional and nuclear munitions, and common tool and equipment items. This is accomplished in order to facilitate the transition of essential technologies to the development and production process in support of tri-service U.S. military and allied forces in order to provide armament systems of maximum effectiveness.

I.2-2 HISTORY

The Role of Mining in the Settlement of the Region

Picatinny Arsenal in northern New Jersey, as well as the surrounding areas in New Jersey and New York, are sources of valuable natural resources. These resources of iron, timber and water facilitated the early development of the region in the iron mining industry. This region was a valuable source of supply for the military during the Revolutionary War. Numerous forges, mines and furnaces can be found throughout this region. The Mount Hope vicinity, which adjoins Picatinny Arsenal, was the site of numerous shafts and a location of mining as early as 1740.

Revolutionary Beginnings

The site of Picatinny Arsenal has been associated with the production of munitions as far back as 1778 when John Jacob Faesch operated a forge on what was once known as the Middle Forge Tract. Cannon shot, bar iron, and other iron implements used in the Revolutionary War were produced at this forge by this master iron worker.

The military installation was first established as the Dover Powder Depot in September of 1880. This name was changed to Picatinny Powder Depot four days after the depot was established. The installation was not known as Picatinny Arsenal until the first powder factory was constructed in 1907.

Picatinny Arsenal's role in research and development first began when a school was started to educate officers in weaponry sciences in 1911. Laboratories were established to conduct tests on artillery ammunition. During early military conflicts Picatinny Arsenal was

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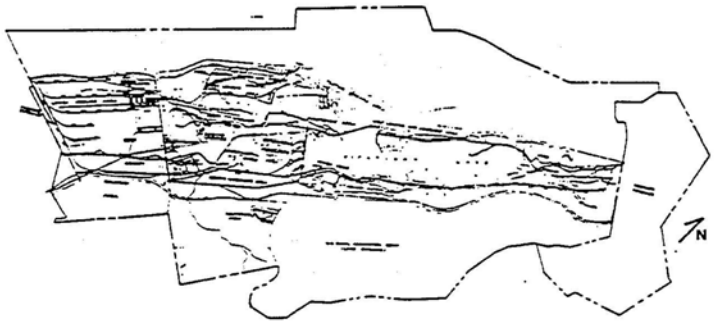
the only facility in the country which was capable of mass producing the ammunition and ordnance needed by the armed forces. Picatinny Arsenal has also made significant contributions in new ammunition and weaponry. By 1977, all except pilot-plant production of ammunition and weapons had ceased, and the focus of the installation was placed on research and development. Today, Picatinny Arsenal is the largest Army installation devoted solely to research and development.

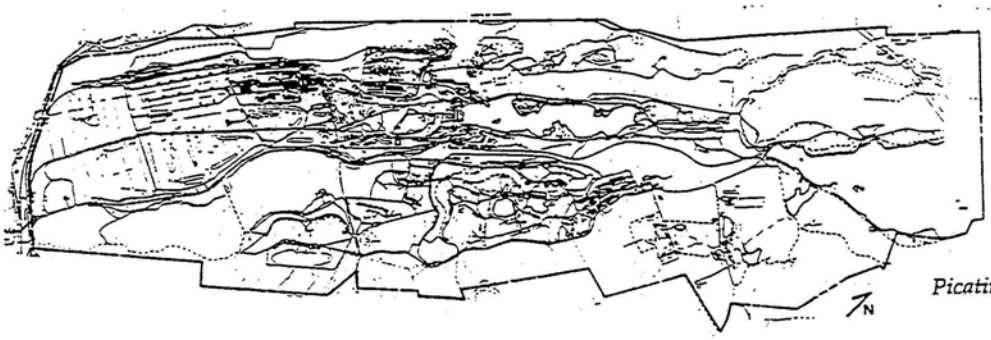
Arsenal Expansion

The Army purchased Wiggins and Doland Tracts along with the Middle Forge Tract in 1880. This area was the site of the forge used during the Revolutionary War. Over the years, additional land purchases were made from various individuals. A strip of land which connected the powder depot to Spicertown was purchased to provide a shorter and more economical means of access between these two points. The Army transferred land near Lake Denmark to the Navy in 1891 for the purposes of ammunition storage.



Picatinny Arsenal as of 1931

On 10 July 1926, lightning struck on Navy Hill which resulted in a major disaster to Picatinny Arsenal. The lightning caused fires and explosions in adjacent powder magazines. Shells were tossed as much as a mile by the explosions. The Arsenal suffered considerable damage and the loss of 19 lives; however, shortly after this disaster Picatinny Arsenal was able to begin rebuilding new and improved facilities.



Picatinny Arsenal as of 1992

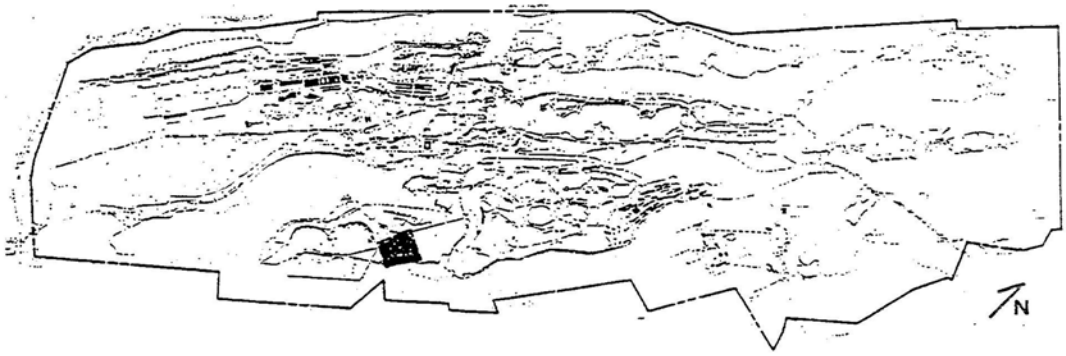
AH 13-20

Through the years, the Army made smaller purchases of land which provided protective areas at the boundaries of the Arsenal. In 1941, the Army purchased Spicertown which included the area between the present day Cannon Gate and the current main entrance near Route 15. In 1960, the Army regained control of the land that had been transferred to the Navy. All of these acquisitions are now encompassed in the present day boundaries of Picatinny Arsenal.

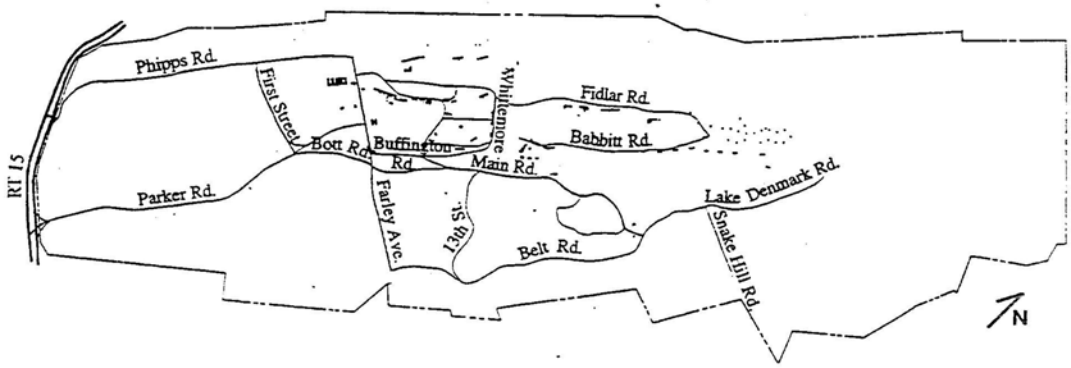
I.2-3 HISTORIC SITES AND STRUCTURES

The IDG supports the preservation of historic sites and structures at Picatinny Arsenal. An historic cemetery is identified by the IDG as an important archeological site. Development is not permitted on the grounds of this cemetery.

A number of historic buildings at Picatinny Arsenal were inventoried and assigned an historic significance in an *Historic Building Inventory* developed by the Army in 1983. The IDG proposes preservation and creative reuse for these structures when appropriate.



Historic sites



Historically significant structures

AH13-21

I.3 CONTEXT AND ANALYSIS

I.3-1 DESIGN PROCESS

The essential goal of the Installation Design Guide is to establish an overall concept with design guidelines that can support the improvement of the visual quality of Picatinny Arsenal. This effort is done in support of comprehensive master planning for the installation that includes long-range real property development and functional land use planning. To create the IDG for Picatinny Arsenal, five steps were followed in an overall *design process* that provides identification, analysis and establishment of the design guidelines for the installation.

Step 1 - Identification

The design process began by conducting a windshield survey of Picatinny Arsenal and interviewing key personnel. During this data gathering phase, historic information and current planning guidance on the development of Picatinny Arsenal was compiled and assessed.

Step 2 - Analysis and Visual Zones

The next step in this process was to categorize the information and identify common patterns of development while searching for clues and guidelines provided by the historic information. An environmental setting was established and site plan and building types defined. The conclusion of this analysis yielded a number of visual zones that convey a discernable image for the Arsenal.

Step 3 - Thematic Areas

A number of thematic areas were then identified for each visual zone. The thematic areas provide the essential components that identify the unique perceptual character of each visual zone. The number of thematic areas within each zone is directly dependent on the level of visual diversity and size of the zone.

Step 4 - Simplified Land Use

Each visual zone was further analyzed as problems and opportunities were identified. The visual zones of the conceptual framework of the IDG were overlaid on the installation's future land use plan. In support of functional development planning, the land use plan was modified to produce the Simplified Land Use Plan.

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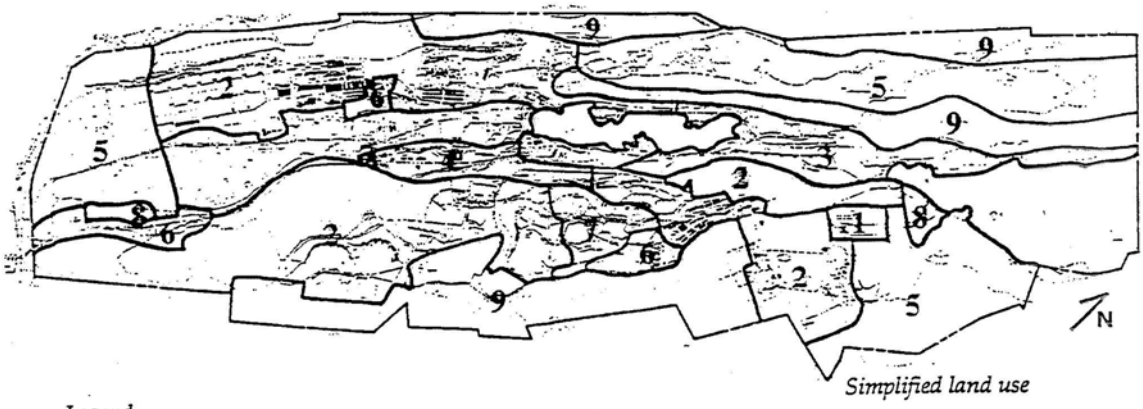


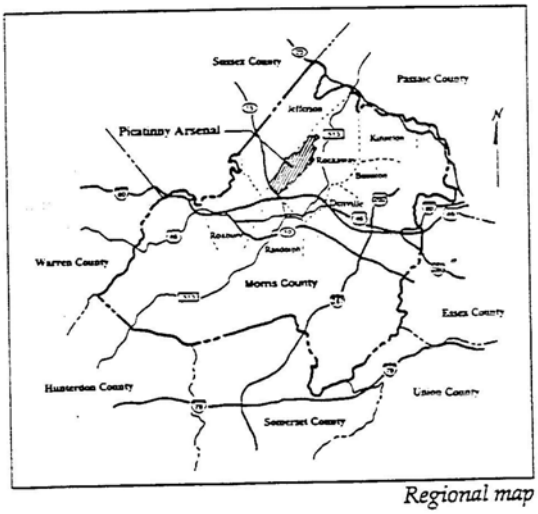
Simplified land use

Legend

1. Airfield
2. Industrial
3. Storage/Supply
4. Administration
5. Training/Range
6. Family Housing
7. Community Facility
8. Outdoor Recreation
9. Open Space

Step 5 - Design Guidelines

Finally, general recommendations are developed for each thematic area based on the characteristics and assets and liabilities of the area. The *recommendations* provide incremental guidance for the implementation of the general concept of the IDG. Specific design guide *requirements* were not incorporated in accordance with the current requirements of Picatinny Arsenal in order to maintain a flexible framework as a living document that can be modified and expanded in the future.

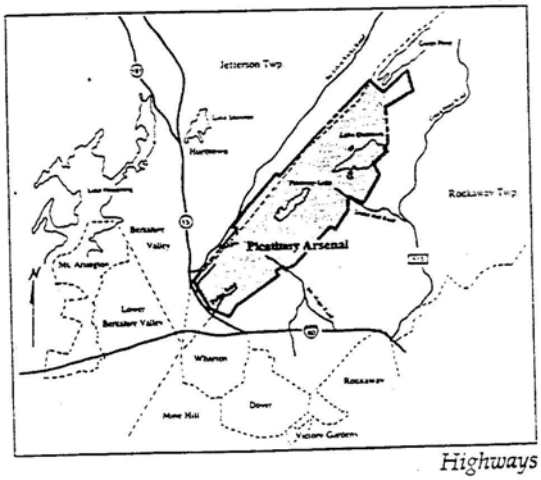


Regional map

I.3-2 REGIONAL SETTING

Picatinny Arsenal comprises approximately 6,500 acres in north central New Jersey and is situated in Rockaway and Jefferson townships in the county of Morris. The Arsenal is located approximately 30 miles northwest of Newark, New Jersey, and is about 40 miles west of the city of New York in New York State.

The installation can be accessed directly from one major highway and is in close proximity to two others. State Route 15 runs in a northwesterly to southeasterly direction and adjoins the southwest boundary of the Arsenal. Interstate 80 is located approximately one mile southeast of the main gate off Route 15, and US Route 46 is located approximately one and one-half miles more to the southeast.



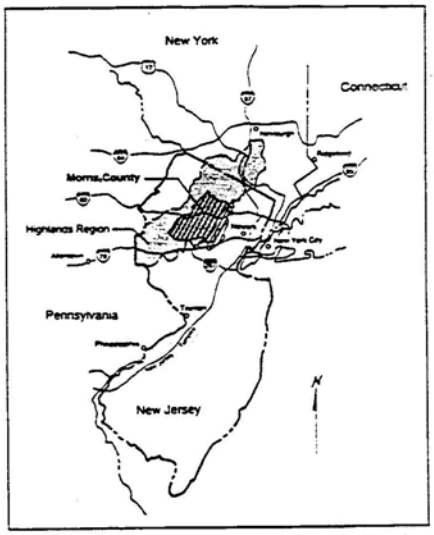
Highways

Surrounding communities include Wharton, which is located about three miles south of the installation, with a population of 7,000; Dover, which is located about four miles south of the installation, with a population of 17,000; Denville township, which is located about six miles southeast of the installation with a population of 18,000; and Rockaway borough, which is located about four miles southeast of the installation, with a population of 7,000.

I.3-3 ENVIRONMENTAL SETTING

New York-New Jersey Highlands Regional Study

Picatinny Arsenal is located within the boundaries of a unique region rich in natural resources. This region, known as the Highlands, stretches from Pennsylvania to the states of New Jersey and New York, and extends into Connecticut.



Highlands Region

The *Food, Agriculture, Conservation and Trade Act* passed by Congress in 1990 authorized the Secretary of Agriculture to appropriate funds for a study of the Highlands Region in the states of New York and New Jersey. This study was called the *New York-New Jersey Highlands Regional Study*. The goal of the study involved the identification of conservation strategies which would result in the long-term preservation of the Highlands region through regional management.

The *New York-New Jersey Highlands Regional Study* was published in 1992. The study team was composed of government agency individuals, a technical committee consisting of a range of organizations and disciplines, and general public participation.

Most of the water supply of northern New Jersey is supplied by watersheds located within the Highlands region. Additional natural features of the region include forested areas, wildlife habitat, and historical and cultural sites. Due to the region's significant water supply and wildlife habitat, the protection of this area was determined to be critical to the future well-being of the region. Continued suburban sprawl from surrounding metropolitan areas was determined to adversely impact these resources. Goals established in the *Highlands Regional Study* include the following:

1) Manage future growth,
2) Maintain an adequate supply of quality water,
3) Conserve contiguous forests,
4) Provide appropriate recreational opportunities, and
5) Promote economic prosperity that is compatible with all other Study goals.

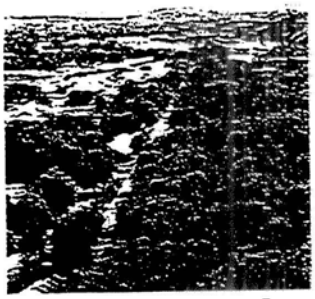
The report prepared for this study is presently being reviewed, and additional data is being collected. Further action is required to determine the most effective planning and management model for the region.

Soils

According to the *Soil Survey of Morris County, New Jersey* (prepared by the Soil Conservation Service, USDA, in cooperation with Rutgers University), there are approximately 14 soil series classifications with over 20 soil phases found at Picatinny Arsenal. The northwestern and southeastern uplands consist primarily of the Rockaway soil series with Rock Outcrop, Hibernia and Ridgebury soil series interspersed throughout. The valley or central portion of the installation consists of the Urban Land, Carlisle, Adrian, Preakness, Otisville and Pompton soil series. Small individual pockets of Whitman, Pits and the Man-made soil series exist in the southeastern half of the installation.

Vegetation

Approximately 75 percent of Picatinny Arsenal is forested. The most prevalent tree type is the Mixed Oak forest type and is located along the northwestern and southeastern ridges of the installation. Oaks and hickories are the dominant species of this forest type.

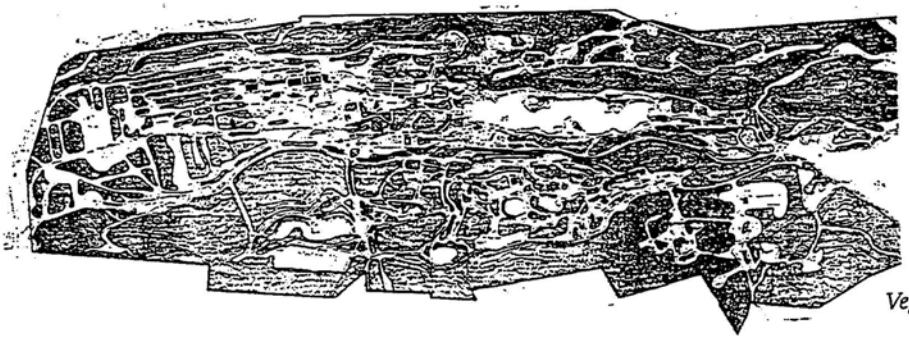


Tree Cover

The Red Maple forest type is found on moist soil sites located in the valley at the southwestern and northeastern ends of the installation. Red maple is the dominant species in this forest type.

The Northern Hardwood forest type consists of a wide variety of species. Sugar maple is the most common species in this forest type along with ash, beech, and birch as common components. This forest type is found in the valley and the southeastern ridge of the installation.

Other forest types which comprise small portions of the installation include the Hemlock forest type and the Aspen/Gray Birch forest type.

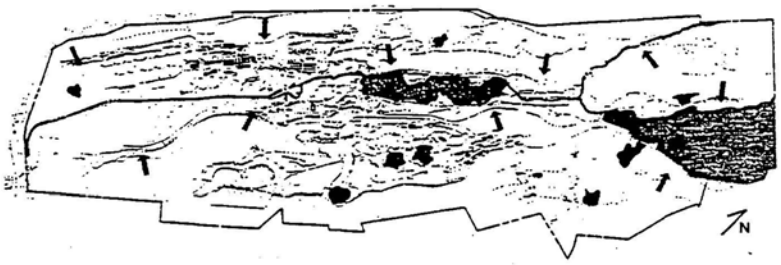


Vegetation

Surface Drainage

The drainage channels flowing through the installation are Green Pond Brook, Bear Swamp Brook and Burnt Meadow Brook. The principal drainage channel is Green Pond Brook and is located at the lower southwest end of the installation near Route 15. Picatinny Lake and Lake Denmark are two major bodies of water located in the valley of Picatinny Arsenal.

The wetlands at the installation are currently in the process of being mapped by the Waterways Experiment Station of the Army Corps of Engineers. The expected date of completion is June 1994. The largest identified wetland area encompasses an area north of Lake Denmark. Moist soil sites have also been identified to include Wetlands, Riparian Zones, Lentic and Lotic habitats, and Bottomlands. A portion of Bear Swamp has also been delineated thus far as a wetland.



Surface drainage

Topography

The topography of Picatinny Arsenal can be characterized by northeast tending ridges that are separated by long, wide valleys. The installation is bordered by a prominent ridge along the northwest perimeter and a series of ridges along the southeast perimeter. Slopes range from nearly level to 3% in the valley and 3% to 35% or greater along the slopes at the northwest and southeast perimeters.

Topography

Elevations within the installation range from approximately 1287' Mean Sea Level (MSL) to 685' MSL. Elevation extremes are found along a portion of the northwest ridge and low elevations are

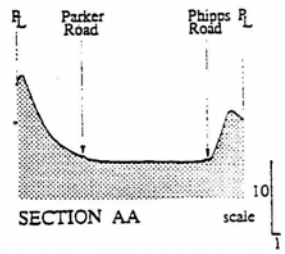
n 11/3 · 26

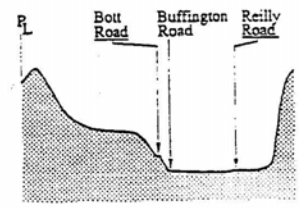
found on the southwest end of the central valley. These high and low points provide an elevation differential of approximately 602 feet. The highest point along the ridges at the southeast perimeter is approximately 1132.5′ MSL.

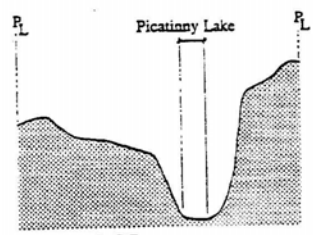
Climate

Picatinny Arsenal is located in a region of temperate climate characterized by warm summers and cold winters. Average daily temperatures vary from a mean of approximately 26 degrees Fahrenheit (F) in January to approximately 70 degrees F in July. The lowest temperatures ever recorded at Picatinny Arsenal occurred in 1949 and 1979. The thermometer registered 14 degrees below zero in each of these years. In 1953, the highest temperature of 105 degrees F was recorded. Other essential climatic statistics include the following:

Average Annual Rainfall	48 inches
Annual Snowfall	43 inches
Rainiest Month of the Year	August







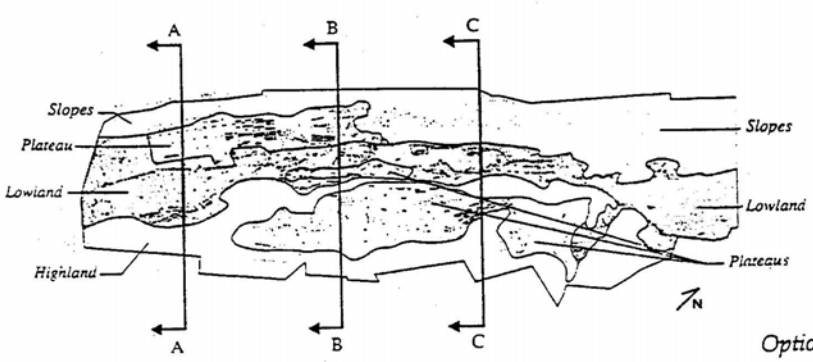
Cross sections

I.3-4 DEVELOPMENT PATTERNS

Growth and Nature

The natural setting of Picatinny Arsenal and the demands on the built environment from the mission of the installation have an influence on the resultant physical form of the installation.

When development was considered, the existing topography and soil conditions, as well as dense tree cover, limited the areas where buildings could be economically constructed. During the history and expansion of Picatinny Arsenal a number of development plateaus occurred. These plateaus provided optimal sites for development because they proved to be relatively flat with good soil conditions. This minimized excavation and reduced the need for extensive grade alterations.



Optional development sites (plateau)

The resulting physical pattern concentrated most of the Arsenal's buildings and facilities on these plateaus surrounded by essentially natural characteristics. Two of the plateaus occur on either side of the northwest and southeast ridges. The southeast plateau includes Navy Hill while the northwest plateau incorporates most of the 000-300 Area buildings. The third development plateau occurs on the installation's valley floor at the south edge of Picatinny Lake.

Thus, Picatinny Arsenal consists of a series of urban pockets embedded within existing dense tree cover and generally organized about a natural, central green spine.

Road Network

The vehicular circulation network on Picatinny Arsenal plays a major role in supporting the visual character of the installation. The roadways of the Arsenal fall within the public realm between buildings on either side of the street. This public realm includes the traffic lanes of the roadways as well as public use spaces in the form of either open green space or sidewalks and side-street parking. A classification of roadways, based on visual characteristics, has been established for the Arsenal using three categories: 1) primary, 2) secondary, and 3) tertiary. The diagram below identifies the primary and secondary roads. Tertiary roads are not shown due to their varying size and great number.

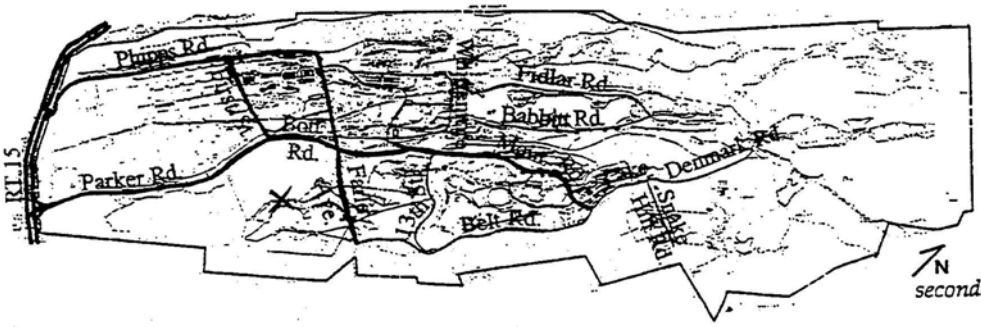
Tree wall

The hierarchy of the road classifications considers not only the technical roadway factors (capacity, volume and speed) but also the visual character of the roadways. This criteria was established based on the visual survey that was conducted during the field effort. Engineering traffic models were not used for the IDG.

The road layout has not changed significantly from what originally existed on Picatinny Arsenal. It has, however, been expanded in areas to its present form. The character of the streetscapes varies throughout the installation. The user experiences different characteristics depending on the location and classification of the roadway. A rural character is predominant, however, due to the presence of extensive and well-established wooded areas.

Legend

Primary
Secondary



Primary and secondary roadways

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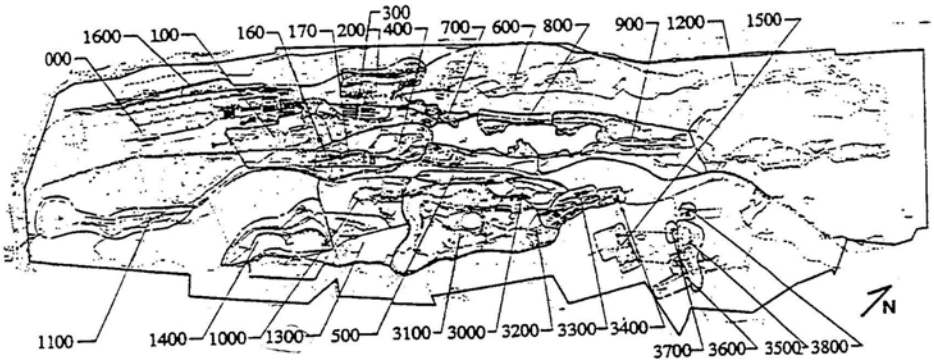
Roadways through tree areas have an established edge or tree wall. Tree walls can be defined as natural wooded edges, formal street tree plantings or scattered trees. The trees can either create a sense of enclosure or allow different degrees of views into surrounding areas.

The tree wall that defines the enclosure that begins at the main entrance to Picatinny Arsenal on Parker Road changes the character of the street as it cuts through most of the installation. The dense tree wall on both sides of the road changes as the road approaches Cannon Gate, where the tree wall switches from both sides to one side of Parker Road. The open side, at this point, permits direct views into the golf course. The character of the street enclosure also changes as the setback of the tree wall varies along the road.

Architecture

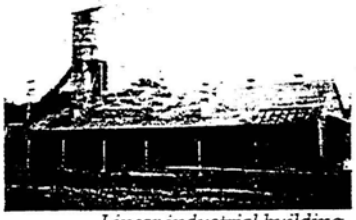
Buildings and facilities in general are organized into areas defined by a numbering system that identifies each building or facility. Related groups of buildings by number series – 100 Area, 200 Area, etc. – are organized throughout the installation. Each building number area, although ordered by a related series of numbers, includes various functions and reflects a variety of architectural styles and building treatments.



The majority of industrial structures on the Arsenal consist of a simple linear footprint and mass with a gabled roof. This linear plan type can be efficiently utilized in topographically difficult areas when positioned parallel to site contours. This, in effect, minimizes the cut and fill required for site preparation as well as additional excavation and earth retaining efforts. The great majority of industrial structures at Picatinny Arsenal have historically utilized this basic principle.

HA 12-29

Regional context, Dover, N.J.



Linear industrial building, Picatinny Arsenal

The gabled roof type found throughout Picatinny Arsenal has a practical purpose as well as a functional one in response to the climate. This roof type prevents snow build-up which would otherwise increase the live load on the structure. The gabled roof type and even hipped roofs are recommended for Picatinny Arsenal in response to climatic influences. Architectural examples in nearby Dover and Mount Hope were found to have similar roof treatments.

Repetitively aligned residential units, found in Dover, New Jersey, illustrate an architectural solution that utilizes compact building footprints and intersecting gabled roofs. The uniform building set-back creates a street wall. This development pattern exemplifies a potential solution for possible future expansion of the single-family residential areas on Picatinny Arsenal.

Regardless of architectural style, buildings at the installation have many common architectural elements such as massing, plan type, materials, fenestrations, and roof forms. These elements can support guidelines for future building development on the Arsenal.

AH 13-30

I.4 DESIGN PRINCIPLES

The *design principles* for the Picatinny Arsenal Installation Design Guide define the fundamental standards of site plan and building types on the installation and establish a conceptual framework for the improvement of the visual character of the Arsenal. The principles have evolved through the identification and analysis of the visual environment, and from the pursuit of the underlying character of that environment and the basic rules needed to improve it. They address the integration and coordination of site plans and building types found on the installation and give definition to the general characteristics of each site plan and building type.

The design principles for improving the visual environment at Picatinny Arsenal are a synthesis of design goals and a response to physical circumstances that are unique to this installation. The intent of these principles is to address existing assets and liabilities at a visual zone level, and establish a framework for future development recommendations and guidelines. The implementation of the principles and guidelines will augment the visual character of Picatinny Arsenal.

I.4-1 DESIGN GOALS

Site Plan

- Establish a cohesive development pattern by locating new facilities adjacent to facilities of related function and land use while creating a compatible presence between the new and existing facilities.
- Highlight the identity of the visual zones by conserving and respecting both the natural and built elements that make up the character of each zone.
- Create activity nodes and landmarks that are strategically positioned to enhance the perceptual structure of the post.
- Establish street hierarchy and develop related setbacks.
- Define open space through buildings and landscape.
- Organize and screen parking lots.
- Encourage shared parking lots in all future development schemes in order to reduce the amount of surface parking.
- Upgrade temporary parking lots and promote the use of pervious paving surfaces such as compacted sand or crushed stone.

A11 13-31

Building Form

- Achieve visual continuity through a greater consistency in the design and siting of buildings. The repeated use of similar architectural forms, materials and styles establishes a distinctive identity for each visual zone as well as for the Post.

  Uniform building setbacks from the roadway edge and a clear spatial relationship between buildings strengthen the visual continuity.
- Define buildings as either "Object Buildings" or "Edge-Defining Buildings" as appropriate, depending on their thematic area, and specific siting.
- Clarify building fronts through distinct forms, setbacks, and landscape.
- Preserve historic structures according to guidelines established by the Secretary of the Interior.
- Encourage the use of punched windows and clear glass in building designs.
- Encourage the use of materials that convey a sense of permanence such as masonry.

Open Space/Landscape

- Highlight the post's natural landscape character through the use of street trees and landscaping of open space areas, as well as the preservation of natural wooded areas.
- Provide screening and correct spatial deficiencies along major roadways through the use of street trees.
- Improve the public realm and open spaces around buildings through appropriate landscaping and public ammenities.
- Screen parking and service areas from roadways, buildings, and pedestrian areas.
- Maintain the existing wooded landscape character of the post.

AAI3-37

I.4-2 CONCEPTUAL FRAMEWORK

The primary objective of the IDG is to improve the quality of the visual environment at Picatinny Arsenal. As an implementation tool, the Installation Design Guide becomes a *conceptual framework* for the improvement of the visual character of the Arsenal. The conceptual framework is established with the creation of six *visual zones* and further supported by 13 *thematic areas.*

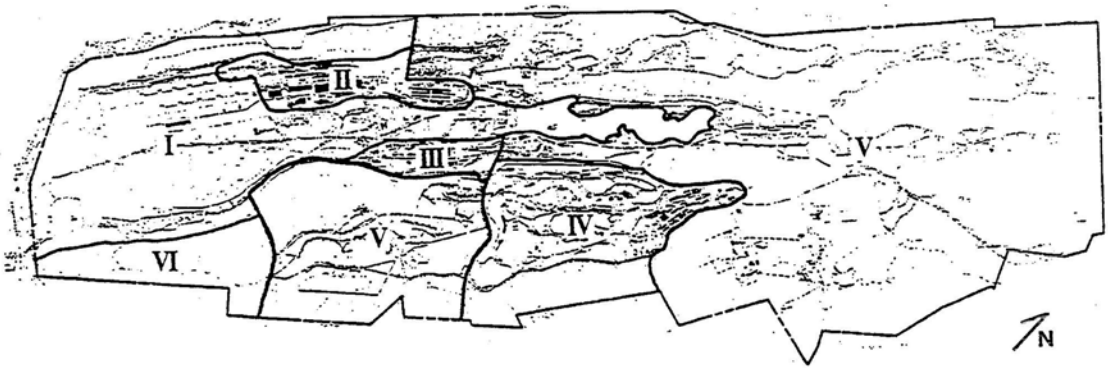
The conceptual framework of the IDG encourages future development to be placed within the existing urban fabric, thus minimizing the intrusion on the natural areas of the installation. These natural areas are environmentally sensitive and, at the same time, create Picatinny Arsenal's beautiful visual character.

Visual Zones

The visual zones are areas of special character and visual identity. These zones are defined by architecture, site plan type, natural features, and landscape treatment. A visual zone may include more than one type of functional land use. To use a private sector example, a neighborhood in a city may encompass a corner store, residences and a school, which are all distinctly different land uses but, in context with the city, are still visually perceived as part of the neighborhood.

Six visual zones are identified at Picatinny Arsenal. The visual zones are:

I. The Green	IV. Navy Hill
II. Downtown	V. The Tracts
III. PM Row	VI. The Highlands



Visual Zones

Thematic Areas

Various thematic areas can be found within each visual zone. A thematic area may be influenced by land use or defined by special site or building details, but essentially has a character that distinguishes it from others within the same visual zone. These site and building details are described in Chapter III of this IDG. Taking another example from the private sector, in a neighborhood two thematic areas may be found. The first thematic area may be called Residential which would include residential dwellings, a school and a corner store. The second thematic area may be called Main Street and would be composed of the street flanked by shops and a public square and church. Although each thematic area is located in the same neighborhood and each has similar urban characteristics, the Main Street thematic area consists of more visual details (such as ornamental street lights, benches, special paving and site furnishings) and may be a central pedestrian node. These differences separate the two areas into two separate thematic areas in the same neighborhood.

Although 13 total areas exist on Picatinny Arsenal, the number of thematic areas within a visual zone depends upon the size and the stylistic diversity within that zone.

The 13 thematic areas are:

- Man-made Green
- Natural Green
- Urban Core
- Transition/Park
- Linear Campus
- Rural Area
- Community Area
- Residential
- Campus/Educational
- Urban Warehouse District
- Industrial Variety
- Industrial Campus
- Village Area

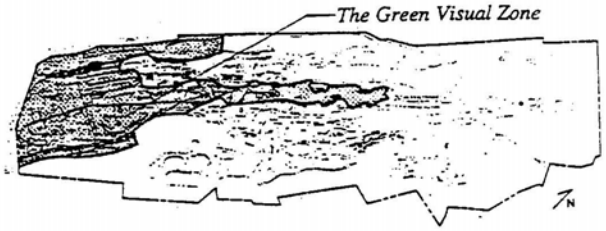
00013-34

II. Visual Zones VISUAL ZONES AND THEMATIC AREAS

II.1 VISUAL ZONE I: THE GREEN

II.1-1 LOCATION AND CHARACTER

The Green visual zone, appropriately named for the *green* visual characteristics of its wooded areas and golf course, extends from Route 15 at the southern boundary of the installation to Picatinny Lake. This visual zone is composed of much of the valley floor between the southeast and northwest ridges. It excludes the downtown area which creates a linear pocket of dense development at the edge of The Green.



Green Pond Brook establishes a natural organizing feature in this visual zone. This visual zone can be characterized as a natural outdoor amenity for the installation, supporting both passive and active recreational pursuits and existing as a natural aesthetic setting. It also provides a scenic gateway to the developed areas of the installation. The Green visual zone reinforces the green image of the installation to visitors and users of the installation who enter at Parker and Phipps Roads.

Green Pond Brook

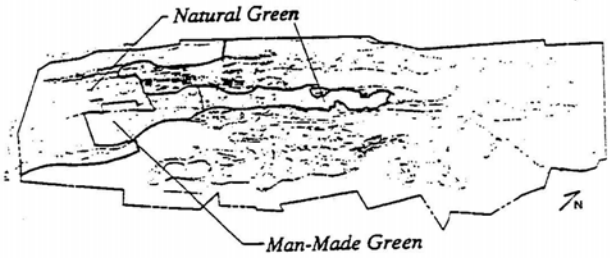
Parker Road establishes a man-made organizing element which begins a linear circulation route through the installation from the Main Gate at Route 15 to the Navy Hill Gate. The Green visual zone accommodates recreational amenities, single-family detached residential dwellings, the visitors center before the Main Gate, and two major entrances to the installation.

The circulation elements and general layout of the visual zone are primarily linear. Most of the roads currently in the valley have existed since the area was originally developed. Buildings are organized along the edges of open spaces with few exceptions. Public open space is composed of the various recreational amenities which include the golf course, fitness trails, softball fields, and the tree-lined streets of Farley Avenue and Parker Road which provide scenic pedestrian walks.

ATT 13-35

II.1-2 THEMATIC AREAS

Two distinct thematic areas located within The Green visual zone are referred to as the *Man-made Green* and the *Natural Green*. The golf course comprises the majority of the Man-made Green. It provides a recreational amenity as well as a visual landmark. In passing through Cannon Gate, views of the golf course and the Man-made Green in the valley become apparent. The Natural Green thematic area incorporates the remaining area of The Green visual zone. It is essentially dense wooded area of the valley floor and northwest ridge. Single-family detached residential dwellings along Parker Road and storage structures in the 000 Area occupy this thematic area. The Main Gate and Phipps Road Gate are used as the primary entrances to the installation through this area. The plantings in this thematic area are primarily natural in the form of dense wooded areas.

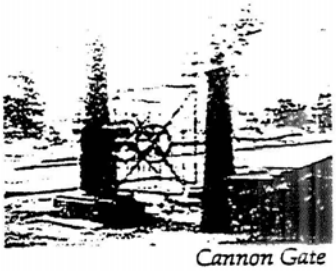


II.1-3 MAN-MADE GREEN

Characteristics:

ARCHITECTURE

- Masonry buildings.
- Buildings are organized along the edge of this thematic area.
- Linear building footprints (Plan Type 1 & 2).
- Simple mass (Type 1).
- Mostly one-story structures.
- Community facilities.
- Historic residential units (i.e., Buildings 112, 114) and other important structures such as the old headquarters building (Building 151).



Cannon Gate

Building 112

Building 114

AH 13-36

- All buildings in this zone are considered figural (object) structures due to their isolated setting (Site Plan Type 4).
- Utilitarian buildings, primarily storage.

OPEN SPACE/LANDSCAPE

- The golf course provides a recreational amenity and visual landmark.
- Scattered groupings of trees are found throughout the golf course.
- Green Pond Brook provides a natural organizing element through the golf course.

Golf Course

Assets:

ARCHITECTURE

- Building Type I provides visual landmarks and acts as visual sculpture (Site Plan Type 4) in the green park setting.
- Historic and architecturally significant buildings provide examples of permanence through details and building material.
- The light, neutral color of buildings in this area provides a pleasant contrast with the surrounding green.

Building 113

OPEN SPACE/LANDSCAPE

- Views of northwest ridge across golf course.
- The first image of the golf course and green valley after passing through Cannon Gate.
- Tree-lined streets of Parker Road and of Farley Avenue near Building 151.

Liabilities:

ARCHITECTURE

- Some of the utilitarian structures, such as Buildings 40 and 41, are situated in highly visible sites.

OPEN SPACE/LANDSCAPE

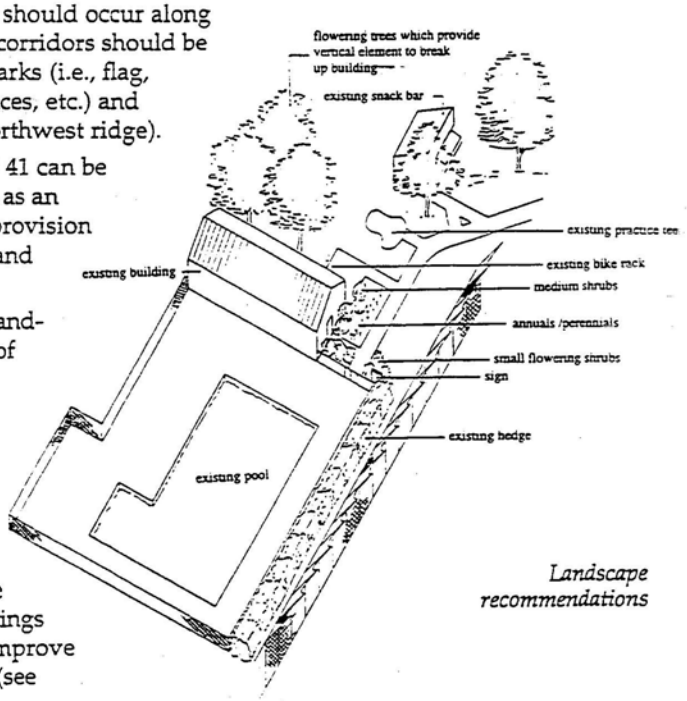
- Lack of foundation planting in the vicinity of the pool and snack bar.

Recommendations:

- The Man-made Green thematic area is visually attractive and well-maintained. The overall recommendation for this area is for the preservation of its current condition and positive visual character.

ATT 13·37

- Any new building development should occur along the perimeter of the area. View corridors should be maintained to significant landmarks (i.e., flag, Officer's Club, historical residences, etc.) and natural features (i.e., wooded northwest ridge).
- The location of Buildings 40 and 41 can be used to the advantage of golfers as an intermediate rest area with the provision of appropriate site amenities at and around the storage shacks.
- Place additional plantings and landscape treatments in the vicinity of the snack bar and the building adjacent to the pool to provide additional visual detail at this important pedestrian node.
- Since there is pedestrian traffic along the adjacent walkway in this area, an opportunity exists to provide more detail in the form of shrub plantings at the base of each building to improve the visual approach to the pool (see illustration).
- Building Type I and Site Plan Type 4 are proposed for this thematic area.



Landscape recommendations

II.1-4 NATURAL GREEN

Characteristics:

ARCHITECTURE

- Few structures exist in the area; those that do exist include Building Types B, C, and I.
- Structures utilize Site Plan Type 4 (Object in Space).
- Low building density.

Main Gate

OPEN SPACE/LANDSCAPE

- Wooded slopes and valley.
- Dense vegetation.
- Wetlands.
- Natural habitat.

Parker Road

Assets:

ARCHITECTURE

- Archeological and historically significant buildings (Buildings 445, 446, and 452).

AM13-38

OPEN SPACE/LANDSCAPE

- Wooded edges along Parker Road.
- Sense of entry established along Parker Road.

Liabilities:

ARCHITECTURE

- No architectural liabilities exist.

OPEN SPACE/LANDSCAPE

- Open storage area behind Building 307.
- Lack of planting at the gatehouse at the main entrance.

Open storage area

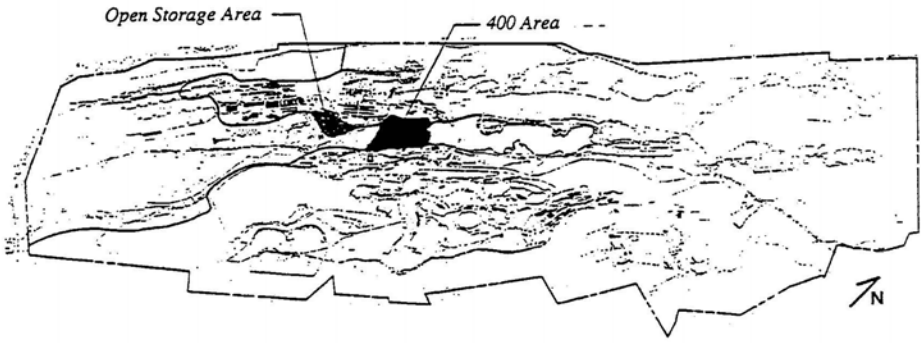
Recommendations:

- Large-scale construction and development is discouraged in the Natural Green area in order to preserve its *natural* character.
- The major recommendation of the IDG is for the extension of the Natural Green Thematic Area into the 400 Area. This will occur first by the removal of the *enclosure* restriction of the 400 Area and, second, by incorporating the storage area to the east of the 300 Area, behind Building 307, as part of the Natural Green thematic area. The new expanded areas must adhere to the guidelines for natural preservation with only passive recreation and educational uses proposed.

Indusrtial structure

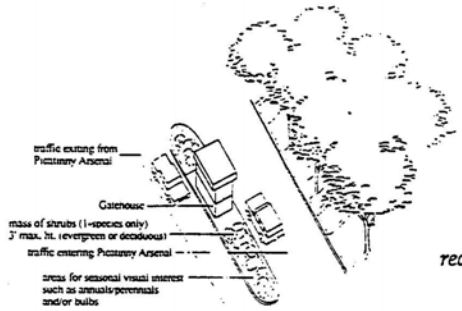
A IT 13-38

To reclaim the storage area behind Building 307, many of its natural features (including wetlands, vegetation, and drainage creeks) should be re-established. Cutting and clearing shall not be permitted in this area (clearing and cutting is, however, encouraged in the Man-made Green thematic area).



Finally, nature trails for recreation as well as educational purposes will be introduced and, existing structures with archeological significance will be converted into museums that can educate visitors about the heritage of Picatinny Arsenal and the history of ammunition production.

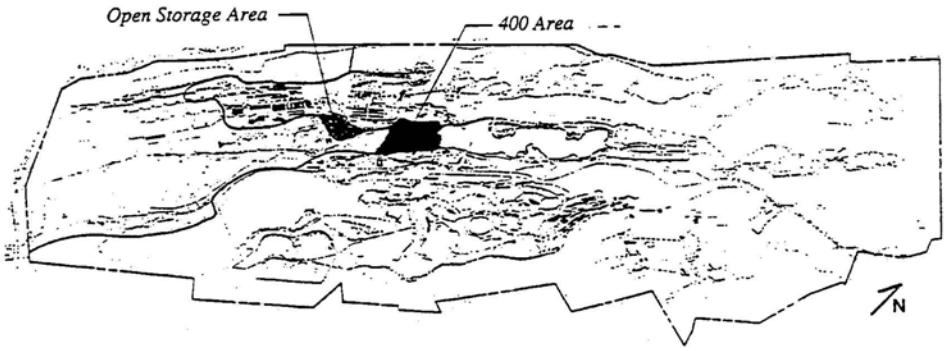
- Deciduous and evergreen shrubs will be placed at the gatehouse (main entrance) to provide visual interest during the winter when annuals and perennials are not in bloom.
- Building Types B, C, and I and Site Plan Types 3 and 4 are proposed for this thematic area.



Main Gate recommendations

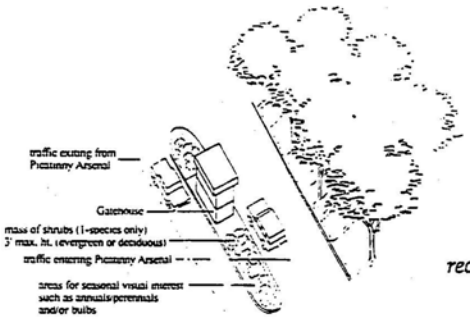
n413-39

To reclaim the storage area behind Building 307, many of its natural features (including wetlands, vegetation, and drainage creeks) should be re-established. Cutting and clearing shall not be permitted in this area (clearing and cutting is, however, encouraged in the Man-made Green thematic area).



Finally, nature trails for recreation as well as educational purposes will be introduced and, existing structures with archeological significance will be converted into museums that can educate visitors about the heritage of Picatinny Arsenal and the history of ammunition production.

- Deciduous and evergreen shrubs will be placed at the gatehouse (main entrance) to provide visual interest during the winter when annuals and perennials are not in bloom.
- Building Types B, C, and I and Site Plan Types 3 and 4 are proposed for this thematic area.

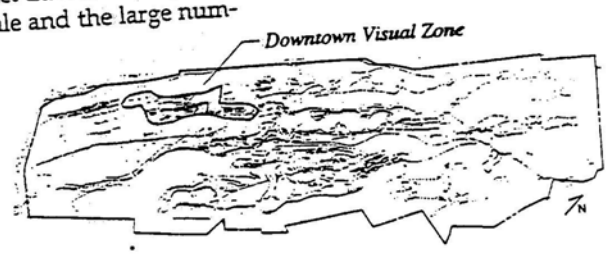


Main Gate recommendations

II.2 VISUAL ZONE II: DOWNTOWN

II.2-1 LOCATION AND CHARACTER

The *Downtown* visual zone delineates an area already known by the name "downtown." This is due to the fact that its density, function, grid circulation network, urban scale and the large number of people at work there approriately reflect characteristics common to downtowns of cities or towns. The Downtown visual zone extends from 1st Street at the southwest boundary to the northeast edge of the 300 Area. Phipps Road and Ramsey Avenue are its northwest and southeast boundaries, respectively. This visual zone is composed of various buildings and parking areas and includes the installation headquarters. A downtown urban setting best describes this zone.

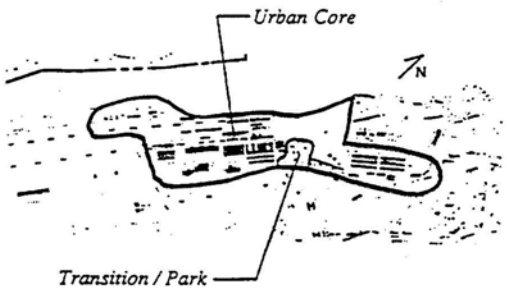


An irregular grid organizes the circulation and general site layout in this visual zone. The mostly linear buildings are organized along the roadway network. The outline of this area is oriented parallel to the valley floor. Open space in this zone is composed of small lawn areas between buildings. In addition, the exterior entrances to Buildings 1 and 12 provide gathering areas and seating spaces for their occupants. There are few, if any, established pedestrian walkways in this visual zone. Parking areas are also numerous and expansive in the Downtown visual zone. The edges of parking lots and street edges are defined for the most part by the building walls.

A# 13-40

II.2-2 THEMATIC AREAS

Two distinct thematic areas are located within the Downtown visual zone which are referred to as the *Urban Core* and *Transition/Park*. The 300 Area and the area between 1st Street and Farley Avenue comprise the majority of the Urban Core. Similar to any downtown, the Urban Core provides a comparison of scale and an opportunity to share resources (i.e., infrastructure, public amenities, etc.). Furthermore, the collective amenities made possible by the grouping of buildings in the urban setting cannot be otherwise provided by a single building in a suburban setting.

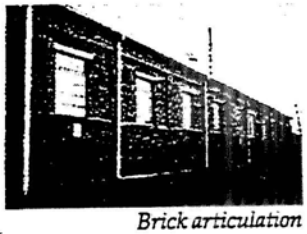


The Transition/Park thematic area provides visual relief between areas of the dense Urban Core and a transition to the 300 Area from the 000 Area where the organizing grid changes angle. A residential park off Farley Lane and Farley Avenue includes a pocket of older, single-family residences used for officer family housing. Some of these residences are of historic significance. Farley Avenue provides a visual focus as a tree-lined main street for these residences. The Transition/Park thematic area creates a visual transition along Farley Avenue, between The Green and the Downtown visual zones.

II.2-3 URBAN CORE

Characteristics:

Urban setting



Brick articulation

ARCHITECTURE

- Masonry buildings.
- Edge-defining buildings.
- Buildings are rectilinear (Plan Types 1 and 2).
- Primarily one-story structures.
- Gabled roofs are typical with the exception of Building 1.
- Infill (Site Plan Type 5) and Grid (Site Plan Type 2).
- Building 1 (Headquarters) creates a visual landmark for orientation through its size and setting (Site Plan Type 4).
- Brick detail on old masonry structures, as in Buildings 31, 302, 318, 321, and other warehouses.

OPEN SPACE/LANDSCAPE

- Lack of vegetation in parking and street areas.
- Streets and buildings located on a grid.
- Overpowering asphalt surfaces for primary and overflow parking.
- Flat topography.

Assets:

Street Wall

ARCHITECTURE

- The old masonry buildings in this area provide positive examples of architectural articulation.
- Masonry structures require minimum maintenance.
- Most buildings are linear and create a unified public presence.
- Opportunities exist for future development by increasing the building (urban) density.

OPEN SPACE/LANDSCAPE

- Grid site plan type provides clear organization.
- Grid street system provides alternatives for ingress/egress.
- Parking located on the southeast side of Building 1 is clearly defined by a planting edge.

Liabilities:

ARCHITECTURE

- Non-masonry building veneer is incompatible with the architectural character of the area and is maintenance intensive.
- New buildings, such as Buildings 1 and 92, are setback and do not respond to the street edge. This is inconsistent with the urban character of the Urban Core thematic area.
- Flat roofs are utilized in this area. This roof type is maintenance intensive and inconsistent with the architectural character of the area.
- Unclear building frontality.

Building 1

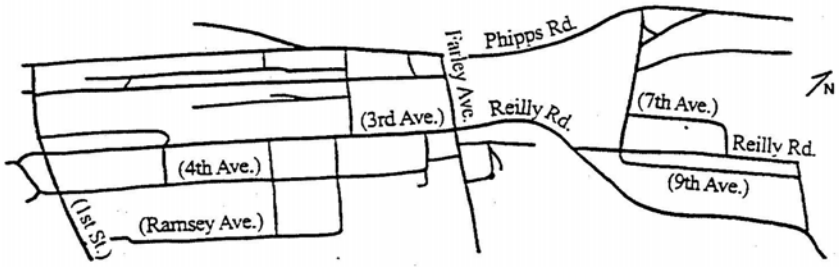
Excessive surface asphalt

OPEN SPACE/LANDSCAPE

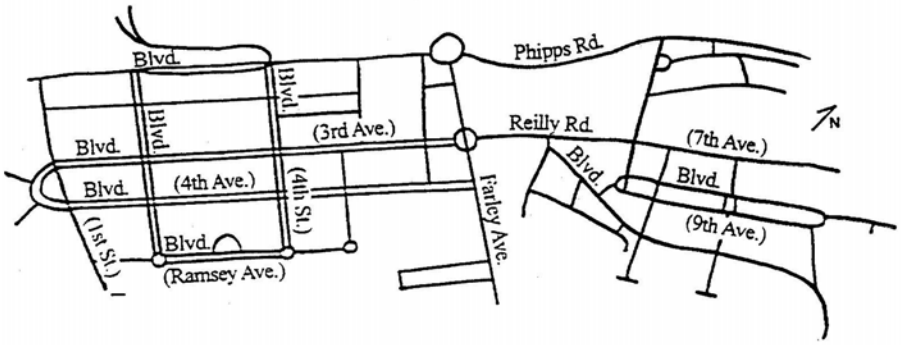
- Intersections are not clearly defined.
- Unclear definition of street edges.
- A hierarchy of streets is not evident.
- Confusing circulation patterns in the 300 Area:
- Excessive amounts of surface asphalt.
- Lack of landscaping in the downtown.
- An incomplete grid system created by a lack of streets that are perpendicular to the existing avenue system and that are parallel to 2nd, 3rd, and 4th Streets.

Recommendations:

- The urban grid is essential to the fabric of the Downtown visual zone and the Urban Core thematic area; therefore, the grid system is clarified by introducing a completed northwest/southeast grid at 4th Street and adjacent to Building 94.

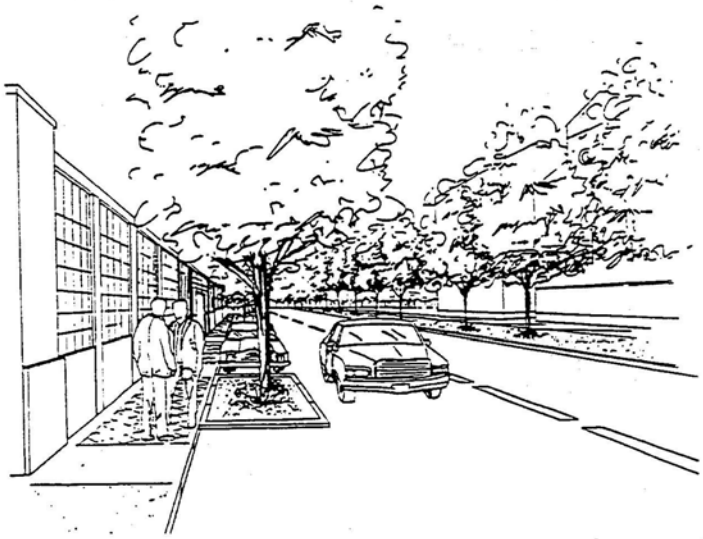


Existing grid



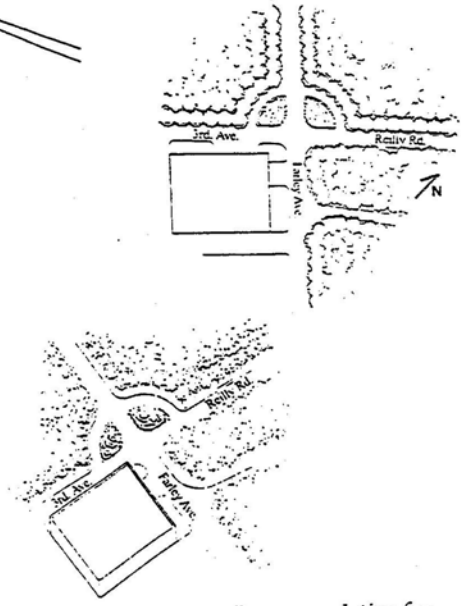
Proposed grid

- Once the new geometry is established, boulevards are introduced to define an urban street hierarchy. These boulevards act as organizing elements for the Downtown zone and provide a framework for future development. The following roadways are designated as boulevards: 3rd Avenue, 4th Avenue, 3rd Street, and an extension of Reilly Road (3rd Avenue) to connect with 7th Avenue. The boulevards become the primary roadways and introduce a visual character that can positively support the downtown. All other roadways parallel to the boulevards are either secondary or tertiary in function, and thus are to be designated as streets and alleys, respectively (refer to III.2-2 for roadway category definitions).



Boulevard treatment - trees define street parking

- Introduce trees and sidewalks along boulevards as the first phase of implementation of trees through IDG guidelines. Tree planters can delineate street parking in narrow sidewalk situations.
- The intersection of Farley Avenue and 3rd Avenue is considered an important event in the sequence of entry to the Downtown visual zone; consequently, special landscape treatment must be provided to enhance the symbolic and visual quality of this node. Additional trees and landscaping are needed to augment the intersection and visually direct the users to their destinations. Furthermore, the site that terminates the north axis of Farley Avenue provides a prime opportunity for a landmark as a building or monument.
- Street curbs are recommended in the downtown area according to the appropriate street classification (see III.2-2).



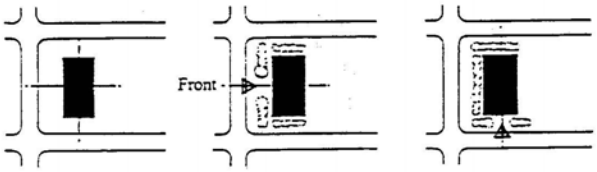
Recommendation for Farley Avenue and 3rd Avenue intersection

A#13-44

- All buildings must respond to setback requirements as dictated by the type of street they front (see III.2-2). A minimum of 80 percent of the building facades must comply with this setback requirement.
- Building 1 is the only structure that violates the setback requirements of the Urban Core. This headquarters facility uses non-masonry materials, continuous strip windows, and a suburban building setback. The deep setback and contrasting character can, however, contribute to the monumentality of the building. This monumentality is appropriate for important buildings and can be supported by assuring that all surrounding buildings comply with the Downtown zone guidelines.

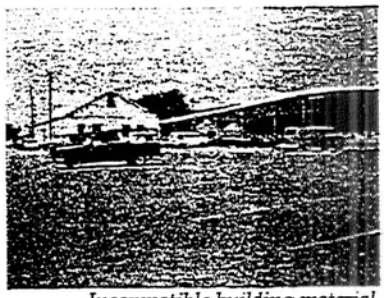
Building 1

- All buildings in the Urban Core require clear frontality. Frontality can be established through architecture or landscaping. Architecture should be used to address frontality in new construction. Clarifying the symbolic front (frontality) of an existing building is possible through landscaping, as architectural solutions for existing structures are typically expensive.



Define building front through landscaping

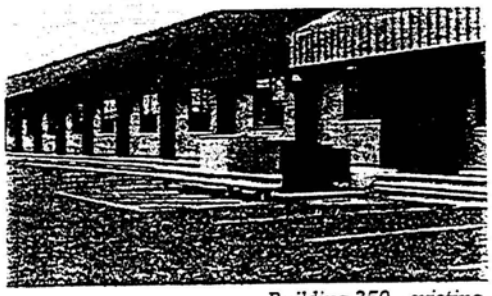
- Masonry material is recommended for buildings in the Urban Core. Stucco finish is acceptable as long as the buildings comply with the other requirements of this area. Generally, buildings are linear or central in geometry with a simple mass and gable roofs.
- Flat roofs are maintenance intensive and do not perform well in this climate; therefore, they should not be used in the Downtown Zone of Picatinny Arsenal in general. (Flat roofs are permitted only if the building's function requires such roof systems.)



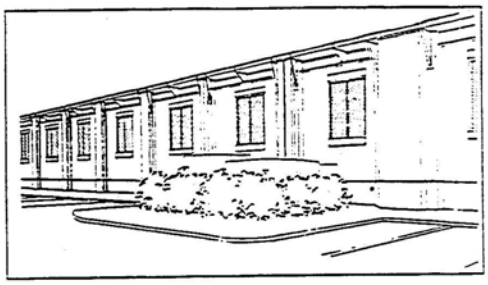
Incompatible building material

- In order to establish a strong sense of cohesiveness and compatible presence, buildings must not use strip windows. These windows are inconsistent with the architectural character of Picatinny Arsenal. Strip windows emphasize the horizontality of a structure which distorts the visual and perceptual scale of the building. Punched windows and industrial windows are recommended and have been used successfully in various locations on the installation.
- Light, neutral colors are recommended in lieu of the current pinks and blues as used on some buildings in the 300 Area.

- The 300 Area, where the grid shifts in response to existing topography and drainage, displays two building types. Both building types are linear, single-story mass. However, they vary in construction material, exterior detailing and roof pitch. The brick warehouse, although utilitarian in function, provides an attractive and dignified presence, while the newer exterior treatment to buildings, such as Buildings 350, 351, 354, and 356, appears dated and temporary.



Building 350 - existing



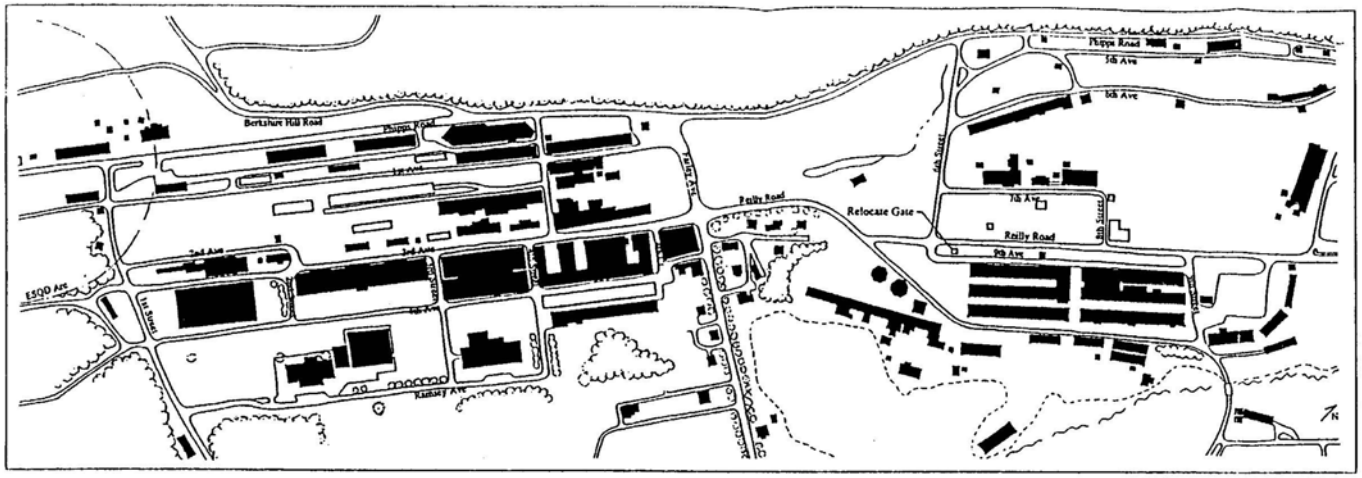
Building 350 - proposed example

The unclear grid in the 300 Area contributes to the lack of visual cohesiveness in the area. The proposed grid in the 300 Area (see page II.2.4) provides an ordering system that organizes buildings in relation to each other and delineates parking lots from streets and building courts and entry from service access. This provides opportunities for landscaping and visual relief from the abundant paved surfaces. The proposed grid can also clarify the pedestrian network in the area.

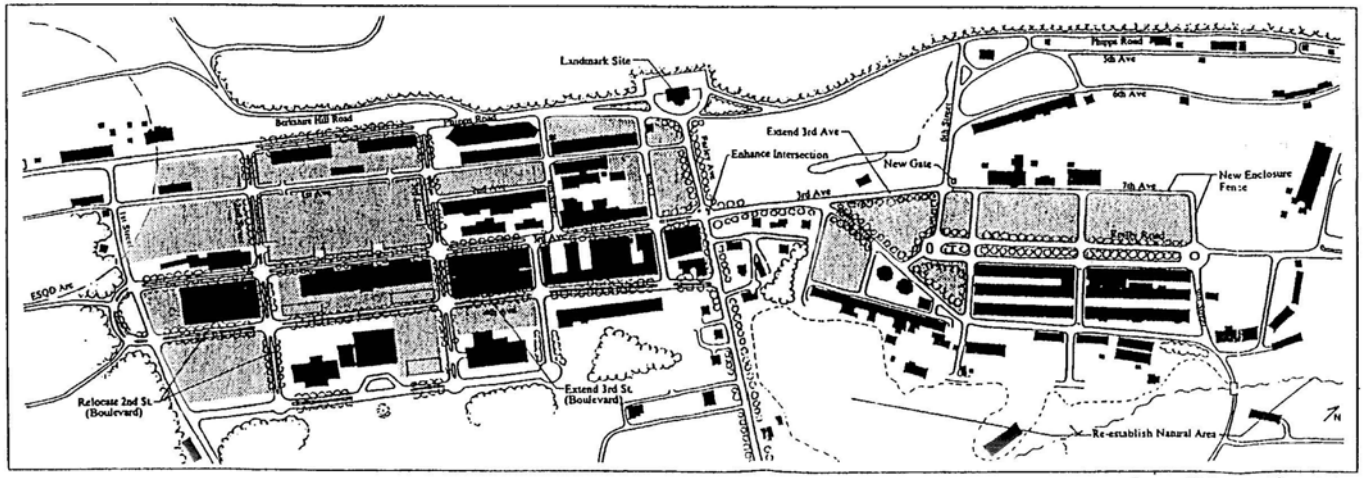
In order to allow for either additional parking and/or future buildings in the 300 Area, it is recommended that the gate to the north enclosure be relocated to 7th Avenue. The newly captured area is thereby integrated within the 300 Area. Furthermore, future overflow parking lots are not to be paved with asphalt since they are used infrequently. Pervious surfaces such as compacted sand or crushed rock provide a natural look and are recommended, especially in environmentally sensitive areas (see III.2-3).

- Building Types A, B, C, D, G, H, and J and Site Plan Types 2 and 5 are proposed for this thematic area.

A#13.46



Existing Urban Core Thematic Area



Proposed Urban Core Thematic Area

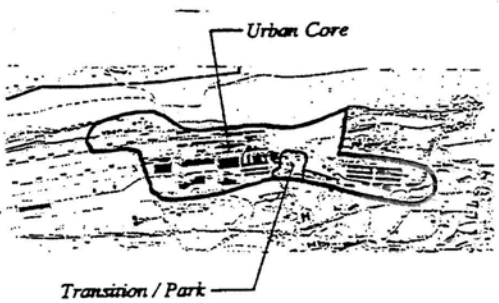
Legend

- Structures to Remain
- May be Demolished
- Future Development

A7713-47

II.2-4 TRANSITION/PARK

Characteristics:



ARCHITECTURE

- Older two-story, single-family dwellings (Building Type I).
- Some houses are of historic significance.
- Masonry and wood structures.
- All wood buildings use white or light colors.

OPEN SPACE/LANDSCAPE

- Private drives.
- Front and rear yards.
- Tree-lined Farley Avenue.
- Park-like setting (Site Plan Type 4).

Assets:

ARCHITECTURE

- Historic houses and structures.

OPEN SPACE/LANDSCAPE

- Tree-lined Farley Avenue.
- Well-landscaped yards (public and private).

Private yard

Liabilities:

ARCHITECTURE

- Some of the structures, especially the parking garages, lack basic maintenance.

OPEN SPACE/LANDSCAPE

- Above-ground steam line.

Recommendations:

- This area provides a visual relief to the dense development of the Downtown visual zone. It also provides a transition to The Green visual zone.
- Priority should be given to routine building maintenance in this thematic area. Future development in this area is discouraged.
- Utilities, especially the visually obtrusive steam line, should be located underground.
- Building Type I and Site Plan Type 4 are proposed for this thematic area.

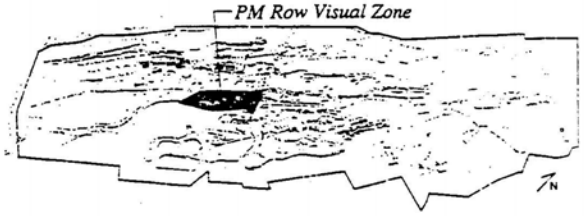
Residential structure

AM 13 -48

II.3 VISUAL ZONE III: PM ROW

II.3-1 LOCATION AND CHARACTER

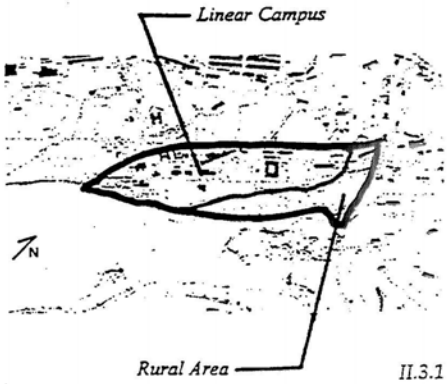
The *PM Row* visual zone delineates an area that incorporates the Officers' Club (Building 121) and many of the project manager office buildings from which the visual zone draws its name in the 160 and 170 Areas of the installation. The visual zone approximates an area from the intersection of Buffington and Bott Roads to the area behind Buildings 162 and 171 to 16th Avenue; the northeast boundary of the zone follows Whittemore Avenue along a parallel line to 13th Street, with the southeast boundary following 17th Avenue and Bott Road back to Buffington Road.



Old brick buildings and scattered lawn areas create a campus-like setting in this visual zone. An implied central axis, as well as the scale and massing of Building 171, reinforce this campus setting.

II.3-2 THEMATIC AREAS

Two thematic areas are located within the PM Row visual zone. They are referred to as *Linear Campus* and *Rural Area*. The Linear Campus thematic area encompasses most of the existing development that establishes the PM Row visual zone. Building 171 is a prominent building in this area due to its size, architectural details and location within the surrounding open space. The lawn areas that surround this building, with their scattered trees, create an outdoor space similar to a college campus. The pediment and columns of Building 171 imply a cross axis to the linear axis of the campus.



AH13-49

The Rural Area thematic area provides a natural backdrop for the Linear Campus to the rising topography of the southeast ridge. Much of the Rural Area is found to the east of Buffington Road.

II.3-3 LINEAR CAMPUS

Characteristics:

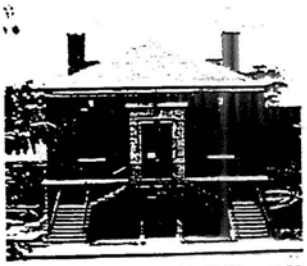
ARCHITECTURE

- Buildings are generally two-story.
- Masonry buildings with simple elevations and punched windows.
- Some buildings are of historic and architectural significance.
- Linear footprints with mostly gabled and some hipped roofs (Plan Type 1).
- The Officers' Club and adjacent buildings associated with the golf course and pool are white. This establishes a light/neutral color theme for the area.

Officers' Club

OPEN SPACE/LANDSCAPE

- Buffington Road has a well-established tree line.
- Scattered lawn trees between buildings.
- Flat topography.
- Linear site layout around Kibler Road (Site Plan Type 3).
- Implied axis at Building 171.
- Medium density.

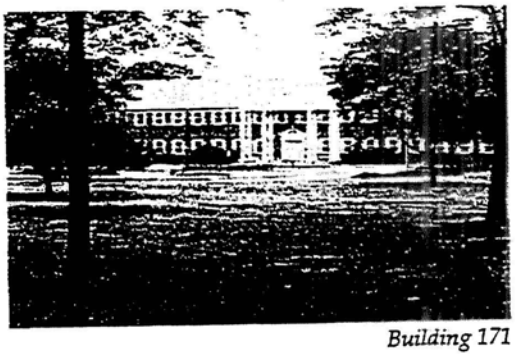


Building 162

Assets:

ARCHITECTURE

- Georgian-style brick buildings.
- Historic structures.
- The white Officers' Club and adjacent buildings associated with the pool and golf course are surrounded by an expansive green lawn area with dense tree cover as a backdrop.



Building 171

OPEN SPACE/LANDSCAPE

- Tree-lined Buffington Road.
- Scattered lawn trees in the area of Building 171.
- Consistent building setbacks along Buffington Road.
- The Green Pond Brook behind Building 171.

A A13 - 50

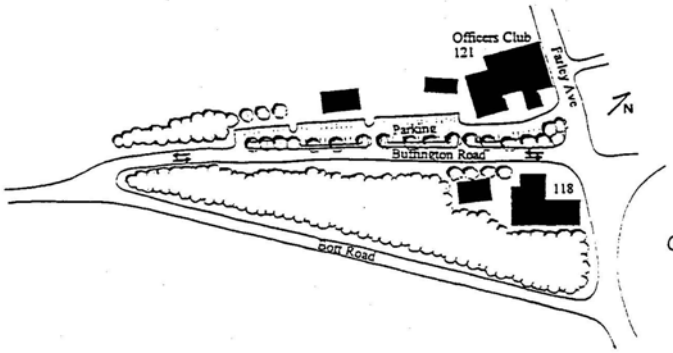
Liabilities:

ARCHITECTURE

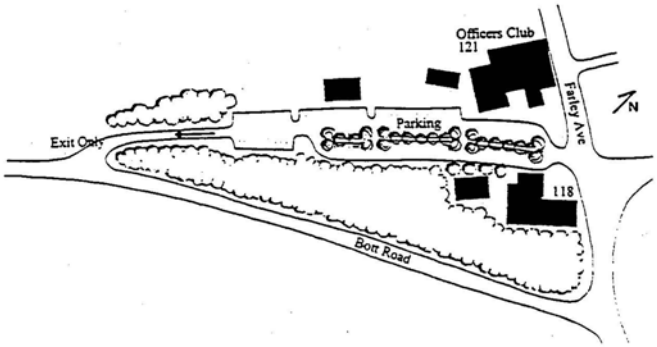
- Selected buildings, such as Building 407, utilize dark (brown) paint colors.
- Service area is unsafe at the Officers' Club along Farley Avenue.
- Some buildings require external maintenance.
- The architectural character of Building 118 is weak and inconsistent with the architecture of this area and of Picatinny Arsenal. Furthermore, this building utilizes a flat roof that is incompatible with the architechural context of the Arsenal as a whole.

OPEN SPACE/LANDSCAPE

- Intersections at Buffington Road and Farley Avenue are oversized and create a negative entry into this area.
- An expansive parking area with excessive parking spaces exists along the southeast side of Buffington Road.
- Parked cars backing out onto Buffington Road at the Officers' Club present a safety hazard.



Alternative 1: parking at Officers' Club (Building 121)



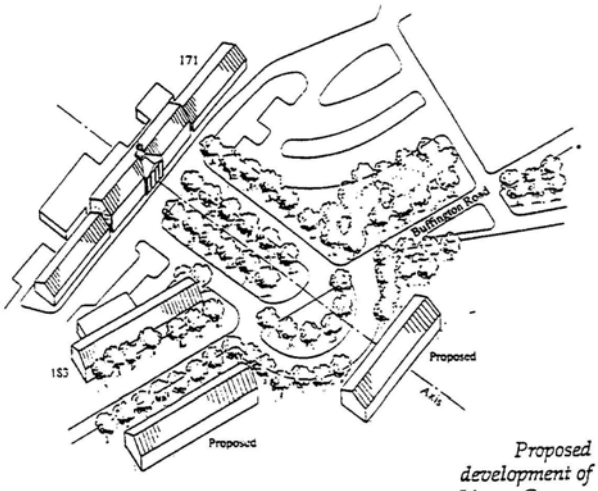
Alternative 2: parking at Officers' Club (Building 121)

ATT 13-51

Recommendations:

- The existing characteristics of this area provide an imageable campus setting and a collegiate environment that employees and visitors can enjoy. The identity of the area is further supported by strong architecture and pleasant landscaping. The IDG proposes to augment the Linear Campus with supporting landscape treatment, an extension of the cross axis at Building 171 across Buffington Road, and future development sites in place of the large parking area on the southeast side of Buffington Road.

- The areas of visual liability, such as the parking lot along Buffington Road, provide sites for future building and real property construction. This creates an opportunity to make Buffington Road pedestrian-friendly and orient it to the campus development on the northwest side of the road. In the immediate term, the parking lot should be divided into a reserve zone for future development and a linear strip for a street-tree and landscaping buffer. The long-term goal is to develop a new building edge or wall on the southeast side of Buffington Road. This solution can control the scale and streetscape of this artery.

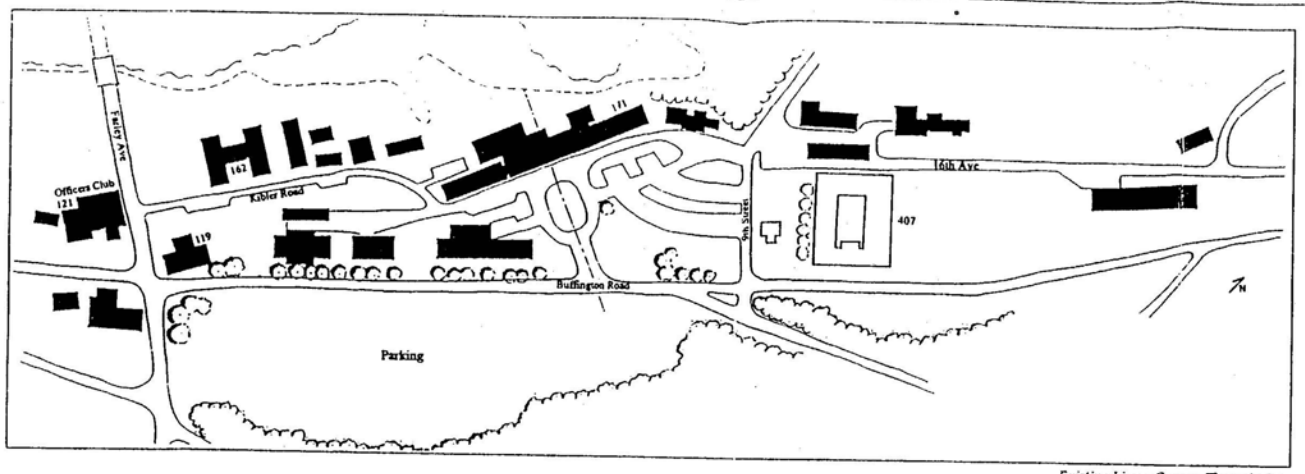


Proposed development of Linear Campus

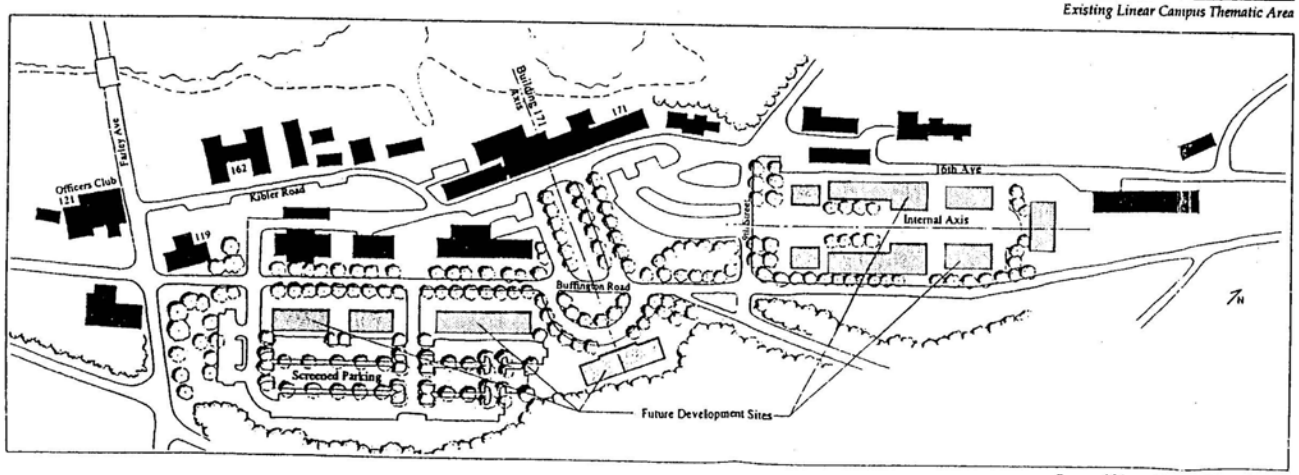
Buffington Road (existing)

Buffington Road (proposed)

A#13-52



Existing Linear Campus Thematic Area



Proposed Linear Campus Thematic Area

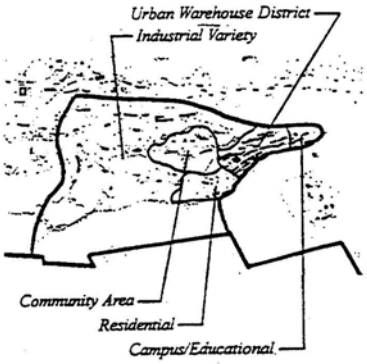
Legend

- Structures to Remain
- May be Demolished
- Future Development

AH13-53

II.3-4 RURAL AREA

Characteristics:



ARCHITECTURE

- No buildings in this thematic area.

OPEN SPACE/LANDSCAPE

- Difficult topography.
- Dense tree cover.
- Rural character with predominantly natural vegetation and tree cover.

Assets:

ARCHITECTURE

- No structures in this area.

OPEN SPACE/LANDSCAPE

- Rural character.
- Dense tree cover screens industrial uses.

Liabilities:

ARCHITECTURE

- No structures in this area.

OPEN SPACE/LANDSCAPE

- Difficult topography and dense tree cover limits future development opportunities.

Recommendations:

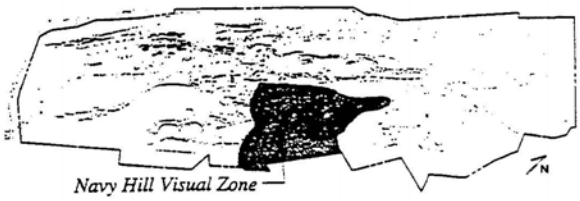
- This thematic area consists of difficult topography and dense tree cover; therefore, no construction alternatives are recommended. The Rural Area thematic area should be retained in its natural setting to help buffer the PM Row visual zone.
- Building Type C and Site Plan Types 3 and 4 may be used in this thematic area.

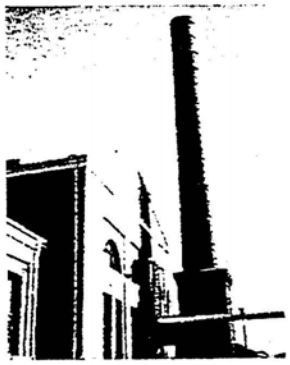
ATT 13·64

II.4 VISUAL ZONE IV: NAVY HILL

II.4-1 LOCATION AND CHARACTER

The *Navy Hill* visual zone includes an area which was originally under the control of the Navy from 1891 through 1960. The name, Navy Hill, is still used to refer to the general area in this vicinity. This visual zone encompasses the 3000 Area of buildings and is delineated by Belt Road and the installation boundary. This visual zone supports the activities and facilities of residential areas, community service facilities, administrative offices, warehouses, and storage areas.



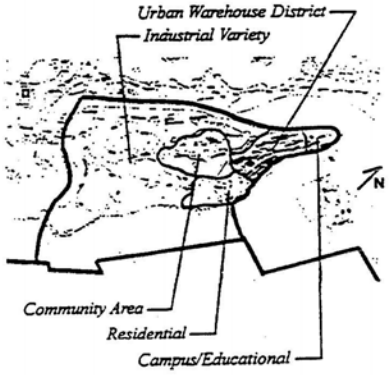


Main Road meanders through Navy Hill providing an organizing element for the visual zone. The Navy Hill Gate provides a formal entry into the visual zone, as well as being a secondary entrance to Picatinny Arsenal. Vehicular circulation and the general site layout of Navy Hill are primarily influenced by topography and natural vegetation.

II.4-2 THEMATIC AREAS

The Navy Hill visual zone contains a number of thematic areas which can best be described as isolated pockets of development with distinct, individual visual characteristics. Five thematic areas are identified within this visual zone. They are as follows:

- Community Area
- Residential
- Campus/Educational
- Urban Warehouse District
- Industrial Variety



ATT 13-65

The *Community Area* is composed of elements such as an open public field and a water reservoir. Although these elements are typically used for passive functions or recreation, they provide visual opportunities for this area. Additional facilities in this thematic area include the chapel, NCO Club, theater, day-care center, and unaccompanied personnel housing. The perimeter of the area is defined by Walsh, Schrader, Main and Gately Roads. The Community thematic area provides a center for residents and personnel to congregate within the Navy Hill visual zone.

Community Area

The *Residential* thematic area is located east of the Community Area and is bounded by Belt, Main and Gately Roads. It includes family housing as well as the old Navy Commander's house, which is a visual landmark of historic significance. This area is heavily used by resident children who play in yards, playgrounds and the little-used streets. The streets are suburban in character, some having private drives and others providing on-street parking.

Residential

The *Campus/Educational* thematic area is located northeast of the Urban Warehouse District area along Lower Belt Road. This area is functionally referred to as *the campus area* since general classrooms and administrative training occur in this area. A formal/axial site layout (Site Plan Type 1) is created by the orientation of Buildings 3408, 3409 and 3410. The streets are suburban/rural in character with narrow paving widths. Wooded areas are found along most of the perimeter edges of this thematic area, thus creating a secluded area surrounded by a wall of dense trees.

Campus/Educational

The *Urban Warehouse District* is located just inside the Navy Hill Gate along Main Road. The site layout is influenced by topography, reflecting long building footprints and repetitive utilitarian structures oriented along the contours of the land. A somewhat chaotic roadway network has resulted with residual spaces for parking created between buildings. No consistent street paving section is evident since the street widths vary between the different building walls in the area. The character of this area is best described as urban, due to its high density of buildings and extensive amount of paving. The post exchange (PX) and the commissary are located in this area and provide a shopping facility for the residents and personnel of Navy Hill and Picatinny Arsenal.

Urban Warehouse District

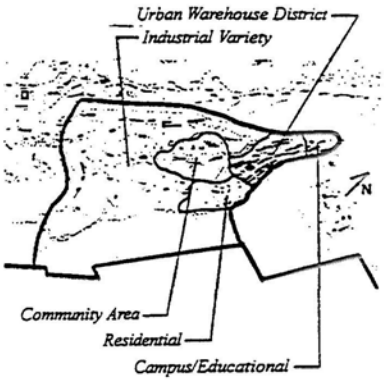
The *Industrial Variety* thematic area makes up the remainder of the Navy Hill visual zone and is the largest of all five thematic areas. Some of the varying uses within this thematic area include the gymnasium, various munitions magazines, and some testing facilities. The perimeter of this area is defined by the reservation boundary on the southeast ridge, 13th Street, Belt Road (to the northwest), and the Urban Warehouse, Community Area, and Residential thematic areas. This area is mostly rural in character and includes scattered facilities surrounded by wooded lots.

Industrial Variety

ATT 13-66

II.4-3 COMMUNITY AREA

Characteristics:



ARCHITECTURE

- Buildings have linear and central plan types (Plan Types 1 and 2).
- Public buildings (i.e., chapel, child center, and NCO Club).
- Simple massing, one- and two-story structures.
- Community facilities are painted white.

OPEN SPACE/LANDSCAPE

- Excessive asphalt surfaces.
- Sparse landscape plantings.
- Water (North and South Basin) is visually and physically accessible.
- Streets follow topography (Site Plan Type 3).

Assets:

ARCHITECTURE

- Appropriate architectural character is supported by the chapel (Building 3221) and Building 3050.
- The color white appropriately denotes community facilities in this area.
- Future development and expansion possibilities increase building density and clearly define open space and view corridors (i.e., approach to church).

OPEN SPACE/LANDSCAPE

- Clear edge defined by topography and wooded areas.
- Pleasant environment that is conducive to recreational and community uses.
- Medium density with a great concentration of public activities.

Liabilities:

ARCHITECTURE

- The design of the NCO Club is inconsistent with the architectural character at Picatinny Arsenal.
- NCO Club is located in a large open field (Site Plan Type 4) that could otherwise be used for recreational activities.

ATT 13-67

OPEN SPACE/LANDSCAPE

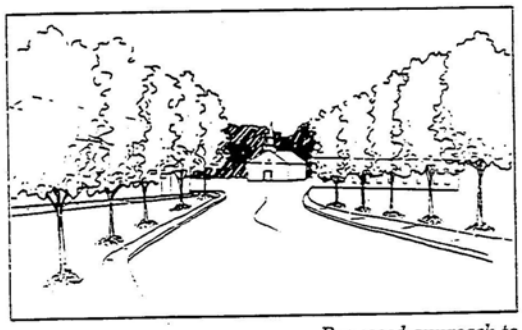
- Excessive asphalt-paved surfaces.
- Roadways are not clearly delineated from parking.
- Lack of space-defining landscape treatment.

Recommendations:

Play Area

- The Community Area provides a high concentration of community facilities and services, all within a comfortable walking distance to each other. This is also a highly imageable area, due to its proximity to the water reservoir and natural woods and open spaces that can accommodate large public or recreational functions. This area must continue to accommodate public uses.
- The circulation system throughout this area lacks physical and visual clarity. Most roadways are not separated from parking zones. These parking zones must be clearly delineated. Street parking on internal roadways (tertiary) in this thematic area is encouraged since it promotes slower traffic which, in turn, promotes safety and awareness of children using the area. Additional landscaping is needed to help define all roads.

Existing approach to Community Area



Proposed approach to Community Area

- The white color scheme also contributes to the area's strong identity and should be maintained. This area offers future development opportunities that could support a child development center or other community uses. New structures can assist in strengthening the definition of public spaces by advancing the visual containment created by the area's building wall.

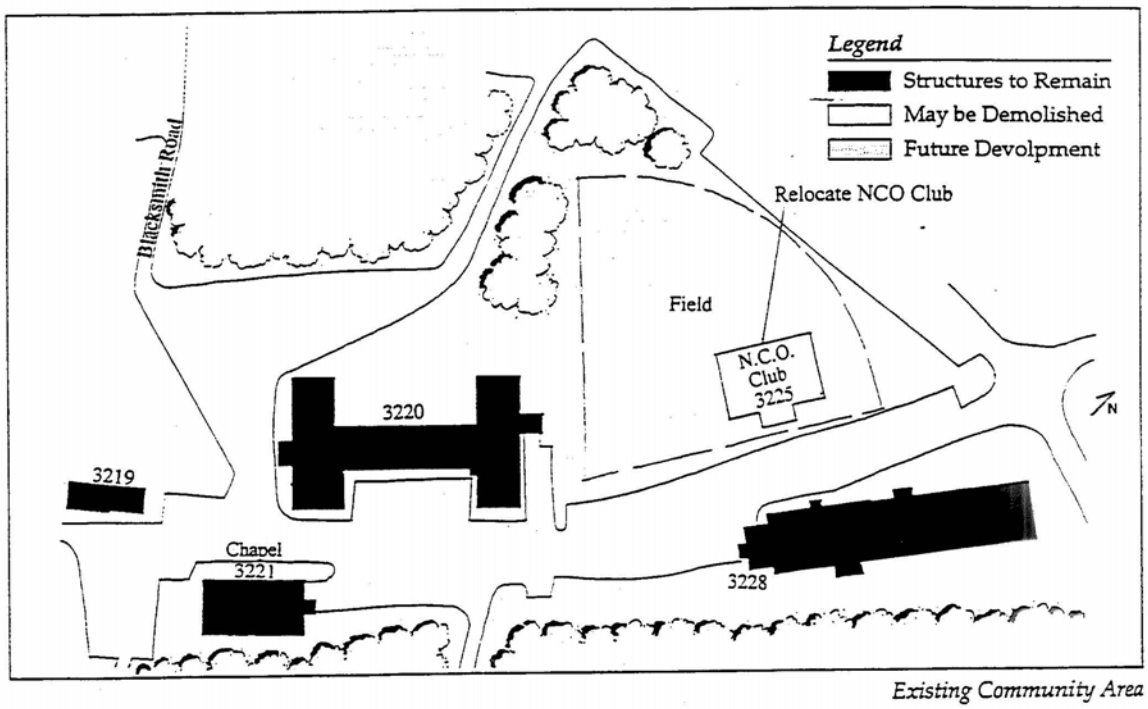
ATT13-68

- The NCO Club is visually and stylistically inappropriate, not only for this thematic area but for the Arsenal as a whole. The brown color, California-ranch style building does not complement any of the characteristics proposed for the Navy Hill visual zone. In addition, the Club is sited in the middle of what was once a ballfield, which destroys the space and its intended use. It is recommended that once it reaches the end of its useful life, this facility be relocated to the other side of the water reservoir near Building 3201. This site offers a natural setting with views of the chapel and the reservoir. The move will allow for a more sensitive approach to development at the Club's current site with appropriate consideration of public spaces.

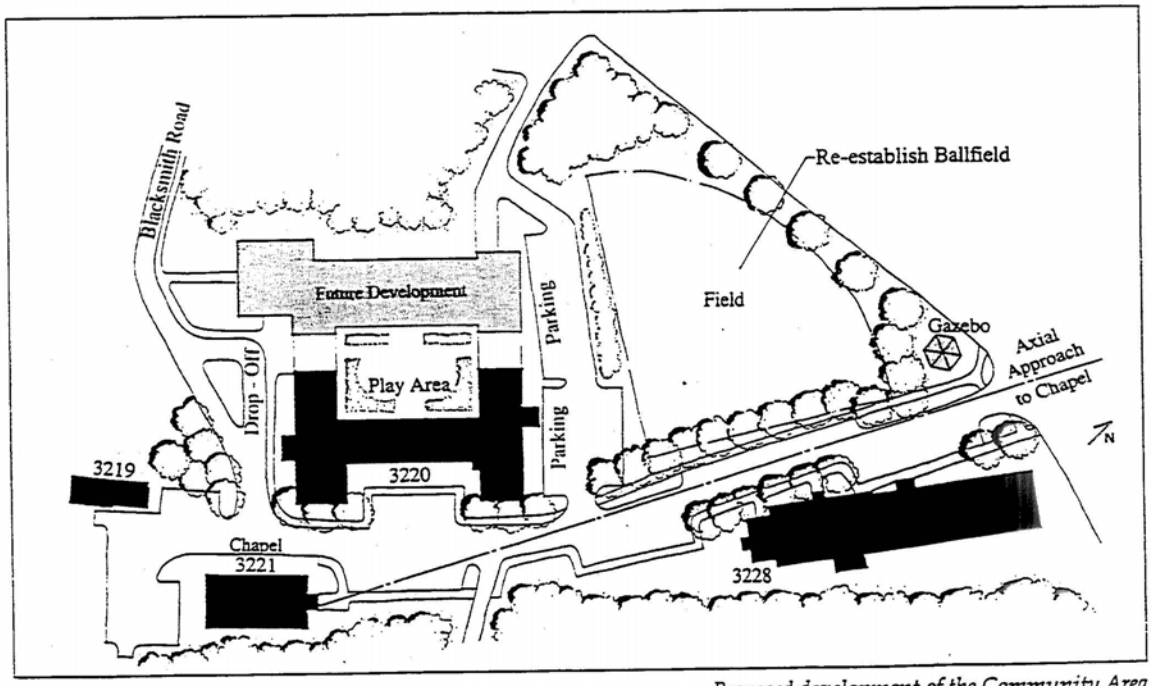
Views of the Community Area (existing)

- Building Types B, C, G, and Site Plan Types 1, 3, and 5 are proposed for this thematic area.

AII3-69



Existing Community Area

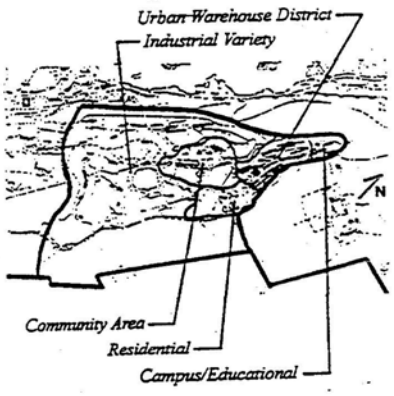


Proposed development of the Community Area

ATT13170

II.4-4 RESIDENTIAL

Characteristics:



ARCHITECTURE

- Primarily Building Type I (Residential).
- Standardized units.
- Consists of masonry and vinyl-sided buildings.
- Buildings exhibit no particular architectural style.

OPEN SPACE/LANDSCAPE

- Surrounding vegetation provides a natural backdrop and a sense of privacy.
- Front and back yards.

Assets:

ARCHITECTURE

- Clusters that create a sense of neighborhood.
- Masonry (brick) buildings are a visual asset.

OPEN SPACE/LANDSCAPE

- Roadways are clearly delineated from pedestrian walks.
- Sense of privacy.
- Public spaces are well-defined.

Residential Area

Liabilities:

ARCHITECTURE

- Random building uniformity that lacks a focal point or community center.
- Trailers.
- Vinyl siding with various colors and the effects of poorly-aged synthetic material.

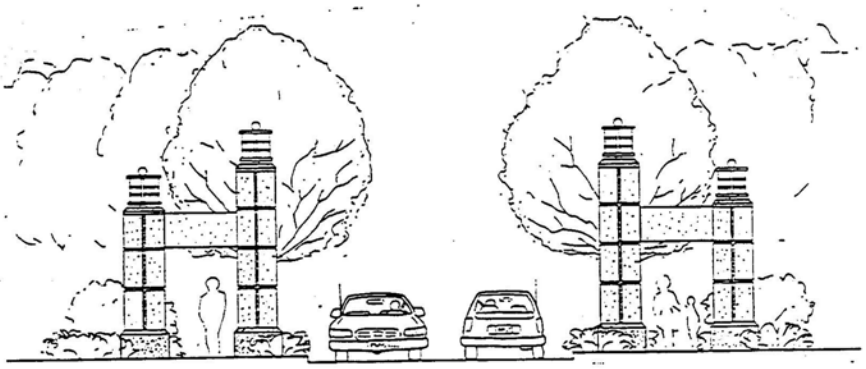
OPEN SPACE/LANDSCAPE

- No announced entrance to residential area.
- No formal pedestrian systems that connect to community facilities; therefore driving is promoted.

DTA13-71

Recommendations:

- Announcing the approach to this area may be achieved through signage or symbolic structures such as an implied gateway or a gazebo placed at the entrance to this area.



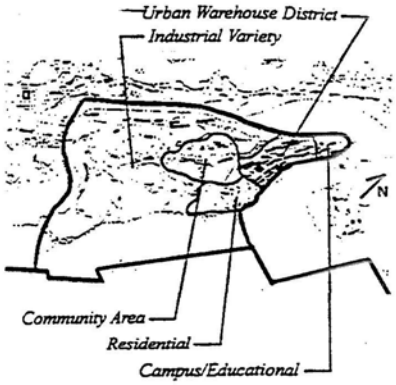
Example of Entrance to ResidentialArea

- This low-to-medium density area can accommodate additional residential units for potential growth.
- Masonry (brick) structures are recommended for their low maintenance and long-term performance as well as their visual qualities.
- Color variation is permitted for all non-masonry buildings in this area. However, no dark or saturated primary colors can be used. A variety of light tones should be maintained.
- Future pedestrian linkage to adjacent areas, particularly to the Community Area and open spaces, is highly recommended since it will reduce automobile trips, consequently saving money and increasing safety.
- All trailers shall be consolidated at one location in the 3700 Area.
- Building Types E, F, I, and Site Plan Types 3 and 4 are proposed for this thematic area.

2HH13-72

II.4-5 CAMPUS/EDUCATIONAL

Characteristics:



ARCHITECTURE

- Linear and central building plan Types 1 and 2.
- Simple massing and gabled roofs.
- Clear hierarchy in building sites.

OPEN SPACE/LANDSCAPE

- Steep topography.
- Formal organization with clear axial geometry (Site Plan Type 1).
- Campus setting (quadrangle).
- Area edges are defined by a surrounding dense tree cover.

Assets:

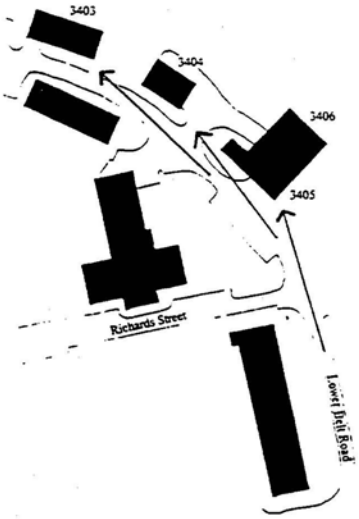
Campus

ARCHITECTURE

- Comfortable scale of buildings and setting.
- Strong relationship between buildings.
- Three buildings (Buildings 3403–3405) are strategically positioned and incrementally deflect views.

OPEN SPACE/LANDSCAPE

- Formal organization of building layout.
- Steep topography provides opportunities for landscaping, ramping and retaining walls that can break the scale of the courtyard and add visual interest. This can also promote additional pedestrian use.
- Area edges beyond buildings are clearly defined by tree walls.



Buildings 3402 - 3404

View deflection

Liabilities:

ARCHITECTURE

- The older structures require extensive maintenance.

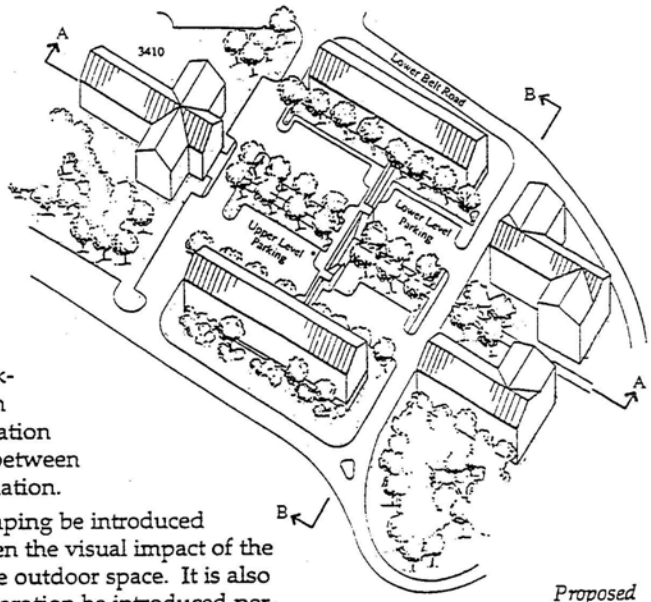
ATT13-73

OPEN SPACE/LANDSCAPE

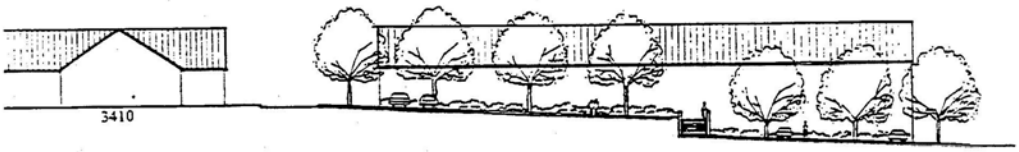
- Large paved parking surface in the area's courtyard lacks landscaping.
- Above-ground utilities (steam lines) create visual clutter.
- Unclear approach to area.
- Steep topography makes drainage on lower sites difficult to control.
- Lack of pedestrian amenities.

Recommendations:

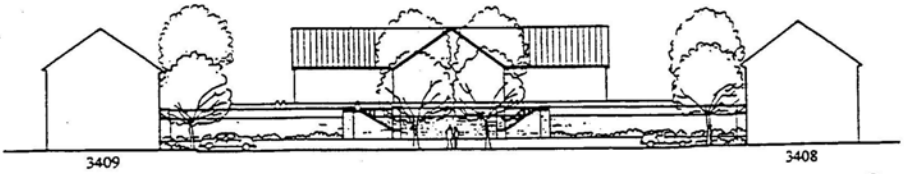
- This thematic area offers a great opportunity to complete an educational campus quadrangle. The scale and sense of enclosure between existing buildings is conducive to the establishment of a courtyard with many uses that can be shared with vehicle parking. The use of topography can provide a clarification of circulation and parking and a separation between pedestrian and vehicular circulation.
- It is recommended that landscaping be introduced in the central courtyard to soften the visual impact of the area and create a multi-purpose outdoor space. It is also recommended that vertical separation be introduced perpendicular to the primary axis of the courtyard to eliminate fast through-traffic along the existing slope. This will support the aesthetic character of the site and reduce safety risks, especially during wet weather.



Proposed development of Campus/Educational Area



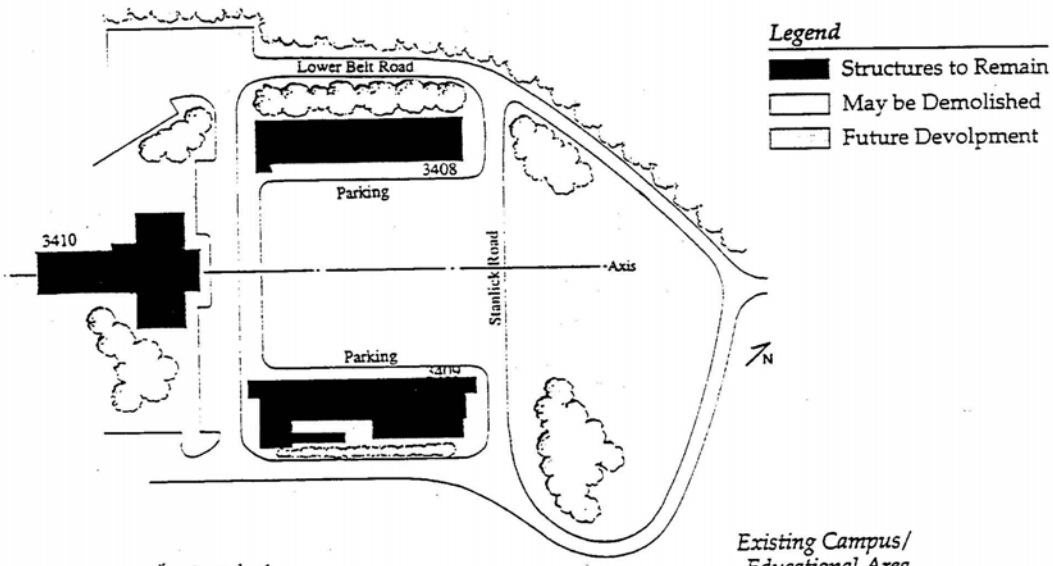
Longitudinal section AA



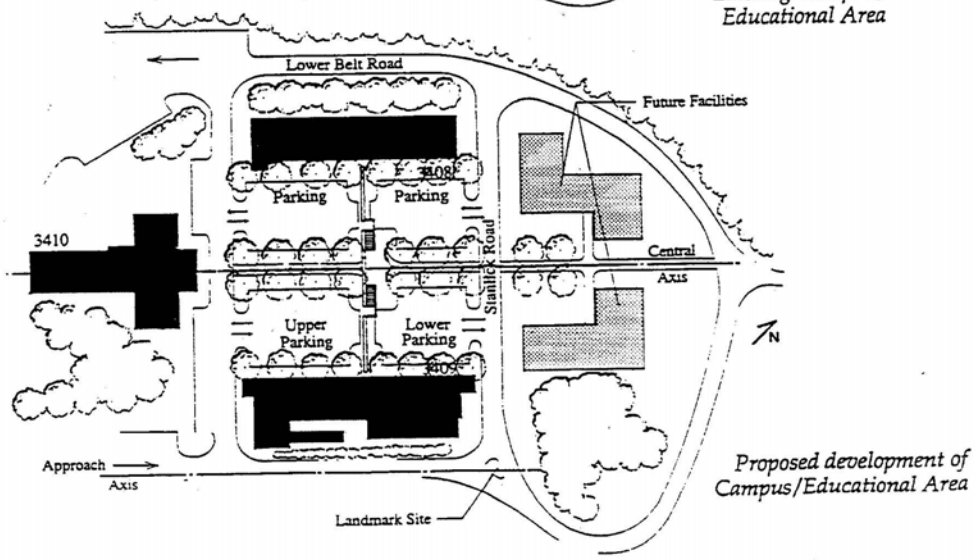
Cross section BB

A713·74

- Steam lines should be relocated underground.
- A landmark site that provides an opportunity to announce the campus on approach should be developed to terminate the approach axis.
- A central spine should be planned as a pedestrian collector which will accommodate level changes, through steps or ramps, along the primary axis of the campus. This system should link to other areas of the installation.
- Future buildings are proposed to complete the lower end of the quadrangle. This will symmetrically enclose the campus while supporting future development requirements.
- Building Types B, C, G and Site Plan Types 1 and 3 are proposed for this thematic area.



Existing Campus/ Educational Area

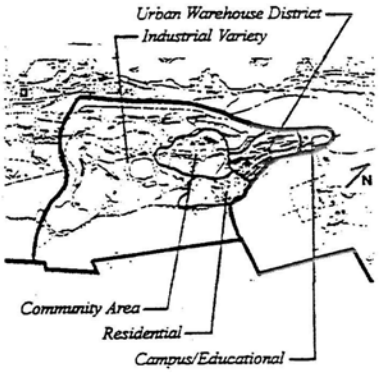


Proposed development of Campus/Educational Area

AMB-75

II.4-6 URBAN WAREHOUSE DISTRICT

Characteristics:

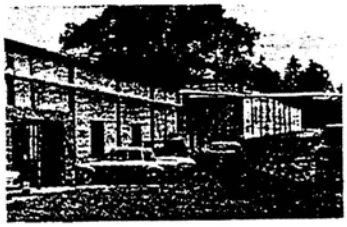


ARCHITECTURE

- Warehouse (Plan Type 1).
- Linear building footprint with flat roofs.
- Masonry structures with minimum fenestrations.
- Architectural uniformity in shape, material and color.
- Storage, retail and administrative uses.

OPEN SPACE/LANDSCAPE

- Road layout follows topography (Site Plan Type 3).
- Urban spaces created through high density.
- Parking areas are not clearly differentiated from the roads.
- Minimal landscaping between buildings.
- Entrance to the area is not well-defined.



Assets:

ARCHITECTURE

- Large volume of repetitive units that establish a dense urban fabric and a variety of urban spaces.

OPEN SPACE/LANDSCAPE

- The edge of the area is defined by dense tree cover.
- Public spaces that are provided in a comfortable urban scale.

Liabilities:

ARCHITECTURE

- Lack of building hierarchy.
- Abundance of uniform units.
- Lack of architectural details.

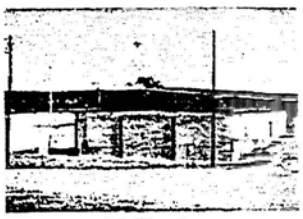
AII 13-76

OPEN SPACE/LANDSCAPE

- No discernable organizational structure in the area.
- Minimal clearances between buildings.
- Lack of hierarchy in the roadway system.
- Unclear differentiation between roads and parking.
- No transition from Main Road into the area.
- Unclear approach and transition into the area from Main Road.

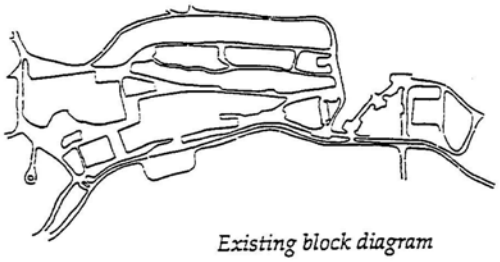
Recommendations:

The dense Urban Warehouse District lacks organizing structure and formality. The quantity and randomness of buildings in this area further contribute to its visual chaos.

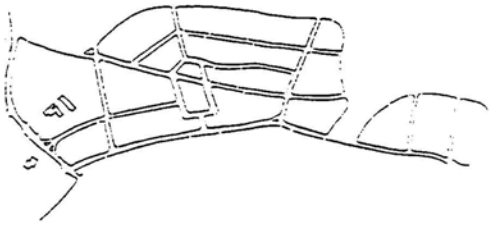


Utilitarian structure

- It is recommended that a hierarchy in streets and public spaces be established. In doing so, a central core or town square is introduced. This hierarchy organizes the roads, functions and spaces, thereby giving the district a focal point that becomes an identifiable landmark. It is intended that the core be either paved with brick pavers or landscaped to achieve a 75% minimum perimeter enclosure (either by buildings or trees).

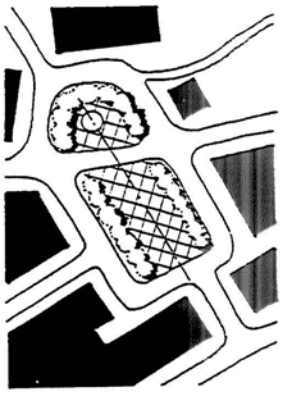


Existing block diagram



Proposed block diagram

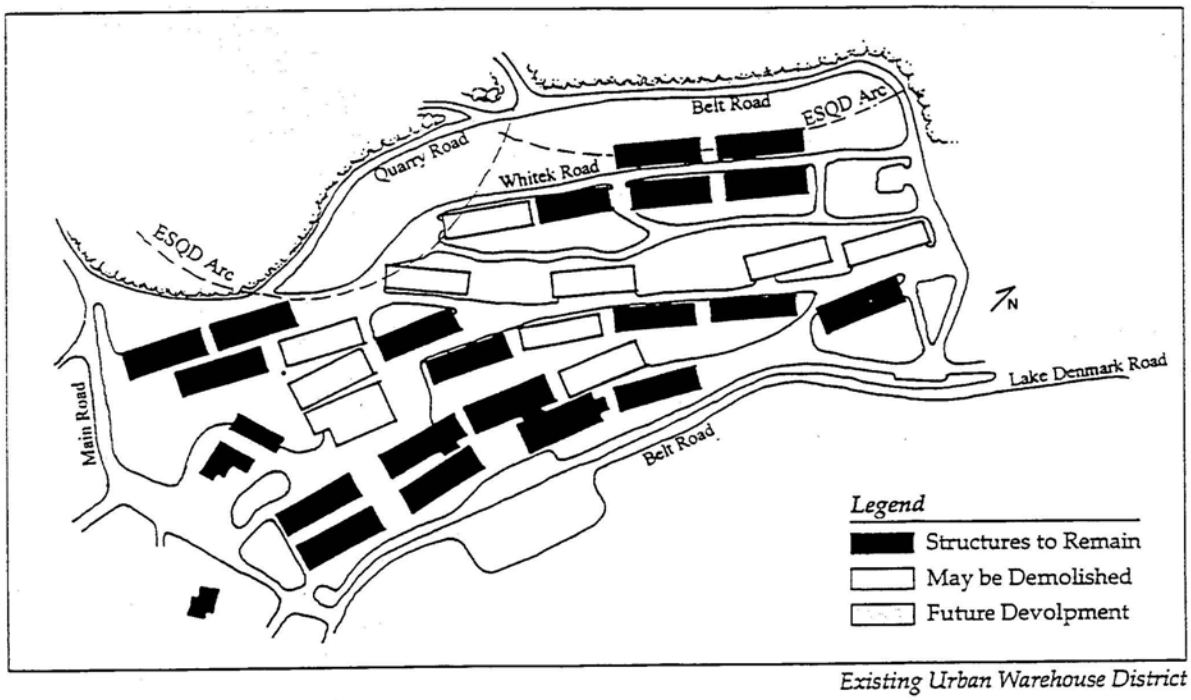
- Once the public square is established, a block system is developed in order to redefine an appropriate circulation network. The proposed block shape will not be based on a perfect grid system; rather it will respond to existing roadways and buildings.
- A formal entrance to this area (from Main Road) is proposed prior to the Belt Road intersection.
- Due to the nondescript architectural character of the warehouses in this area, entrance locations must respond to the main roads to help facilitate ease of access. Future development sites that help define the hierarchy of space and formality of the area have also been identified. Also, buildings that conflict with the new circulation network and block system are identified for future demolition. Fenestration and other facade details are encouraged along the primary boulevards.



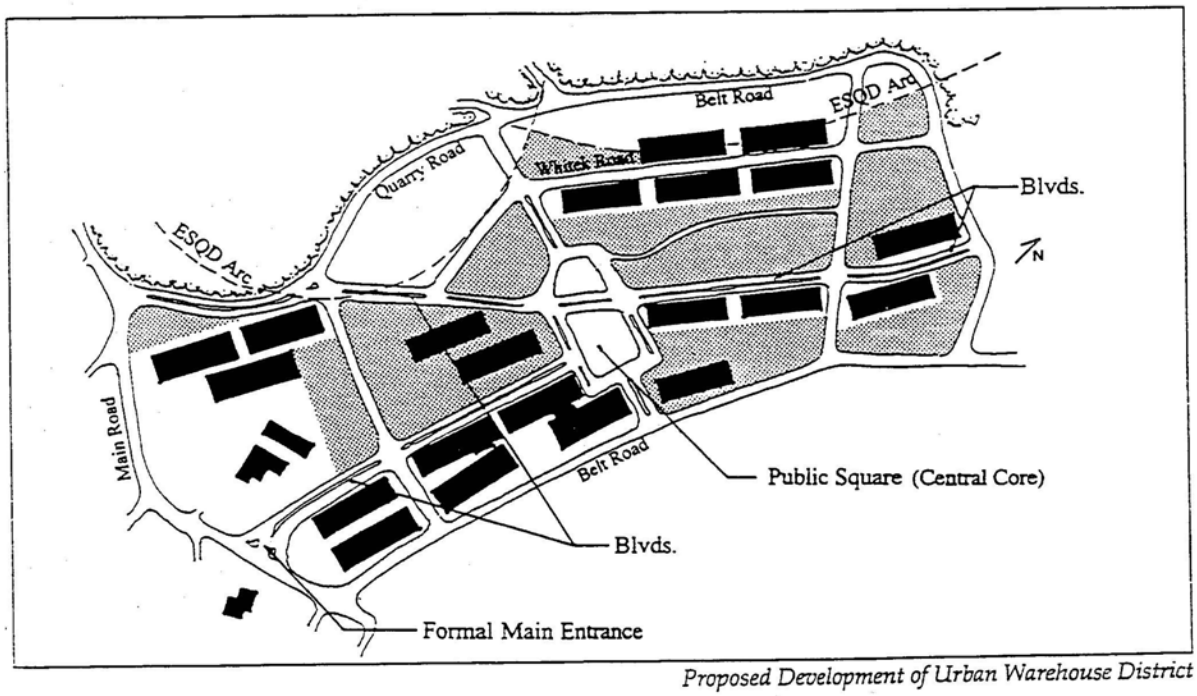
Proposed public square

ATT 13-77

- Light neutral colors (beige or gray) are recommended for this area.
- Building Type B, C, D, G, I, J and Site Plan Types 2 and 3 are proposed for this themaic area.



Existing Urban Warehouse District



Proposed Development of Urban Warehouse District

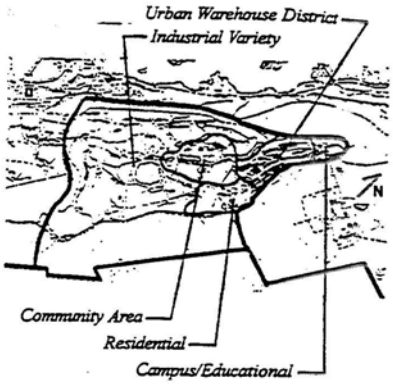
DH13-78

II.4-7 INDUSTRIAL VARIETY

Characteristics:

ARCHITECTURE

- Linear building footprints, mostly Plan Type 1.
- Some specialized functions create unusual building shapes and sizes.
- Masonry structures, mostly warehouse or industrial uses.
- Simple and elegant architectural details.



OPEN SPACE/LANDSCAPE

- Road layout follows topography (Site Plan Type 3).
- Surrounding wooded areas provide walls of enclosure and effective screening.
- Country road with natural wooded edges.

Assets:

ARCHITECTURE

- Cohesive visual relationship established by mostly masonry structures.
- Unique object buildings embedded in dense tree cover.
- Majority of older buildings offer extensive brick details.
- Building 3150 is a landmark due to its size and juxtaposition.

Building 3150

OPEN SPACE/LANDSCAPE

- Rural setting.
- Roadway system also reflects a rural character, with natural vegetation defining the edges.

Liabilities:

ARCHITECTURE

- Majority of older buildings (utilitarian in function) require extensive maintenance.

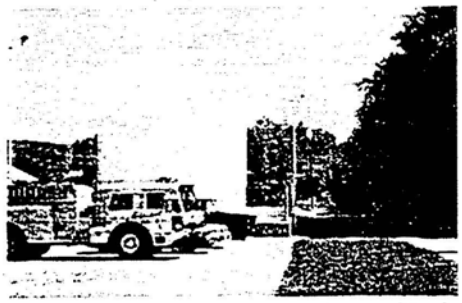
OPEN SPACE/LANDSCAPE

- Lack of screening for tanks located near the gymnasium (Building 3150).

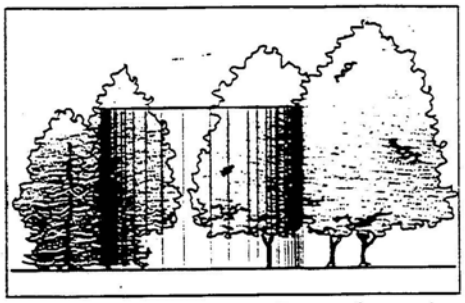
AT/13·79

Recommendations:

- It is strongly recommended that the rural and natural character of this area be preserved with minimal intervention. Therefore the roadways should not be increased in width and the edges should be kept natural in character, rather than having highly groomed shoulders. This augments the rural image of the area as well as provides savings in maintenance costs. These savings can be directed toward improvements recommended for other zones such as Downtown or PM Row.

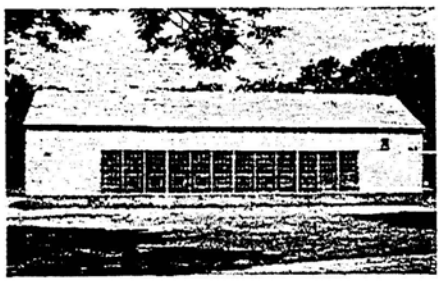


Exposed tanks



Proposed screening

- Provide landscape screening around exposed tanks, especially where they are highly visible to the public.
- Natural vegetation and screening must be preserved throughout the thematic area.
- Building Types B, C, D, I, J and Site Plan Types 3 are proposed for this thematic area.

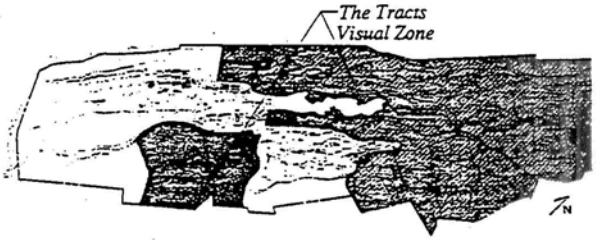


RTI3-90

II.5 VISUAL ZONE V THE TRACTS

II.5-1 LOCATION AND CHARACTER

There are three large stretches of land at Picatinny Arsenal which have been included in *The Tracts* visual zone. The historic acquisition of tracts over the lifetime of Picatinny Arsenal has helped to define the current boundaries of the installation. Many of these tracts were acquired as the functional requirements of the Arsenal demanded. Today, much of the land area of the three main tracts is designated as enclosure areas in support of munitions storage and explosive safety setbacks. In fact, two of the tracts lie within the enclosure areas; the third tract encompasses an open area, accessible to the public, located outside the Navy Hill Gate and south of Lake Denmark. The resulting configuration of these areas defines two distinct tracts in The Tracts visual zone.



In both of The Tracts, the visual character is essentially rural. It is primarily composed of densely wooded areas. Road sections are rural in character and their enclosure is defined by the surrounding natural wooded edge which creates a tree wall. The roads in each of The Tracts areas cover long distances and are not heavily travelled; therefore, pedestrian circulation along the roadways is not practical or necessary.

Circulation in this visual zone generally follows topography. Buildings are in close proximity to the road in most areas and, in many cases, the buildings are tucked into pockets of surrounding wooded areas. Many buildings were historically used for production of ammunition and are either vacant or used for storage. Some of these structures are of archeological importance.

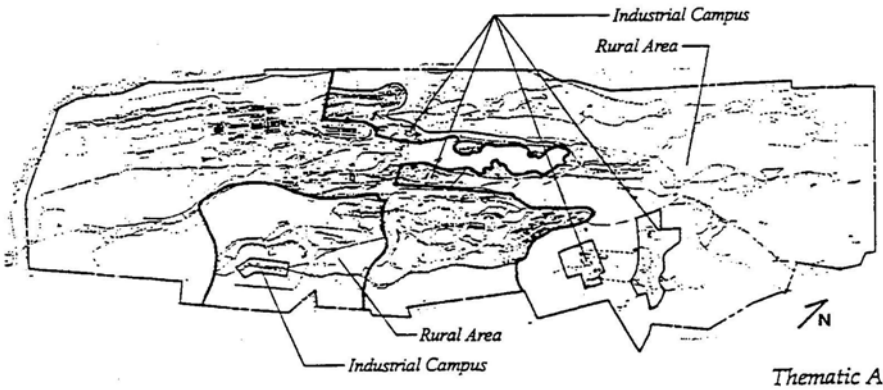
The Tracts visual zone surrounds Picatinny Lake and Lake Denmark. Views are provided across the water to the opposing mountain ridges.

DTT 13-81

II.5-2 THEMATIC AREAS

Two thematic areas have been established in The Tracts visual zone. The *Industrial Campus* thematic area is composed of pockets of developed areas which contain groups of buildings.

The *Rural Area* thematic area consists of individual buildings which are visually isolated within the surrounding wooded area. The character and requirements for this area are similar to the Rural Area thematic area in the PM Row visual zone.



Thematic Areas

II.5-3 INDUSTRIAL CAMPUS

Characteristics:

ARCHITECTURE

- Linear buildings (Plan Types 1, 2).
- Mostly masonry structures with industrial uses.
- Facility exceptions include tower structures (Building Type H).
- The majority of the buildings have simple massing with gabled roofs.
- Low-to-medium density campuses (Site Plan Types 1 and 3).

OPEN SPACE/LANDSCAPE

- Surrounding wooded areas provide walls of enclosure and screening for industrial buildings.

Industrial building

RTI 13-82

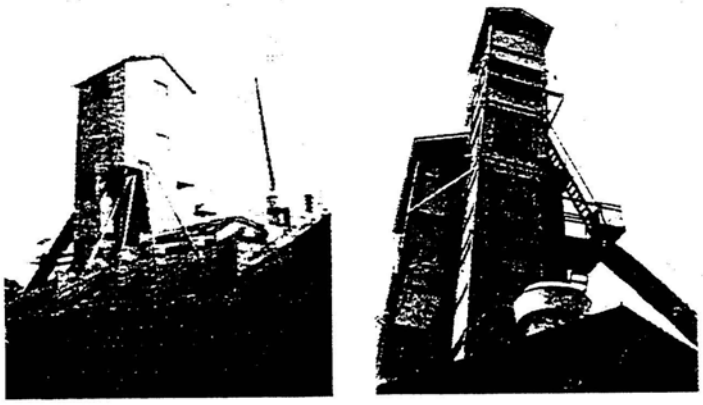
Assets:

ARCHITECTURE

- Industrial vocabulary unique to Picatinny Arsenal and its heritage.

OPEN SPACE/LANDSCAPE

- Rural, wooded setting.



Examples of tower structures

Liabilities:

ARCHITECTURE

- Some structures have extensive damage and may require expensive repair.

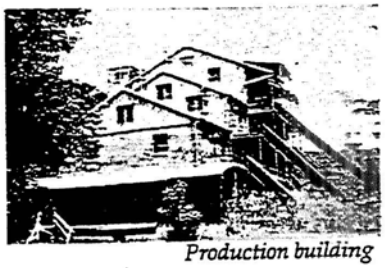
OPEN SPACE/LANDSCAPE

- Limited areas have been cleared at some of these campus sites.
- Functional restrictions in the enclosure areas.

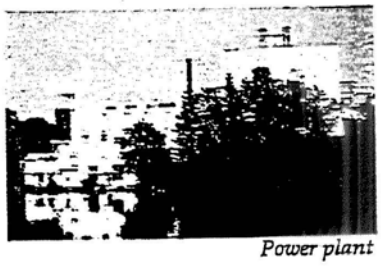
Recommendations:

- The key recommendation for The Tracts visual zone is minimal intervention. The large natural areas, including those in the Industrial Campus thematic area, should remain undisturbed. Construction of new facilities should be kept to a minimum.

  Any necessary future buildings should be accommodated within the existing campus which will prevent unnecessary clearing of natural wooded areas. Exceptions due to function requirements must be reviewed on an individual basis for approval.
- Building Types C, D, H, J and Site Plan Types 1, 2, and 5 are proposed for this thematic area.



Production building



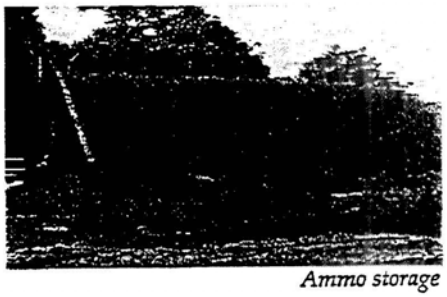
Power plant

AM 13-83

II.5-4 RURAL AREA

Characteristics:

- Difficult topography.
- Dense tree cover.
- Rural character with predominantly natural vegetation and tree cover.
- Buildings are isolated objects (Site Plan Type 4) with a few exceptions such as the trailer park and the National Guard heliport.



Ammo storage

Assets:

ARCHITECTURE

- Specialized buildings, such as the ammo storage (igloos).
- Utilitarian buildings of industrial architectural character.

OPEN SPACE/LANDSCAPE

- Rural character.
- Dense tree cover screens industrial uses.
- Wetlands.
- Archeologically important landmark site (cemetery).

Liabilities:

ARCHITECTURE

- Building exteriors require maintenance.

OPEN SPACE/LANDSCAPE

- Difficult topography with dense tree cover and wetlands limits future development opportunities.

Recommendations:

- The Rural Area thematic area consists of difficult topography and dense tree cover. Consequently, construction in this area must be avoided.
- All existing structures currently in use should be maintained on a regular schedule.
- Building Types C, H, J and Site Plan Types 3 and 4 are proposed for this thematic area.

ATT3-84

II.6 VISUAL ZONE VI: THE HIGHLANDS

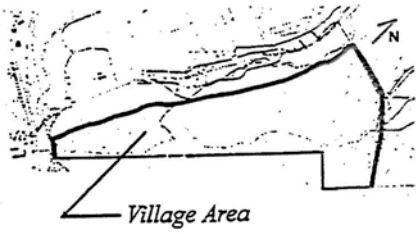
II.6-1 LOCATION AND CHARACTER

The Highlands visual zone is located on the southeast ridge of Picatinny Arsenal above the row of single-family residences on Parker Road. It encompasses the upper slopes along the installation boundary from Route 15 to the utility easement and enclosure area fence. This area is naturally wooded with no existing development which typifies the natural characteristics of the state's Highlands region. Future growth in research and development is planned for this area.

Since Parker Road is located in close proximity to this visual zone, efforts should be made to preserve the natural character of the area. This will help preserve the positive visual impacts along one of the major entry roads into the installation. The tree wall along Parker Road is essential to the entry experience of visitors and employees of Picatinny Arsenal.

II.6-2 THEMATIC AREAS

The Highlands visual zone consists of one thematic area that is called the *Village Area*. Since the area is currently undeveloped, recommendations are made concerning architecture, open space and landscaping needed to create the desired image for this visual zone.



The thematic area encompasses the entire visual zone because no single area can be defined as best for development at this time. This is particularly true because of the lack of environmental and ecological data for the ridge. By designating the entire zone as the Village Area thematic area, the IDG can help to control the visual impact of any development planned or proposed in the future.

ATT 13-85

II.6-3 VILLAGE AREA

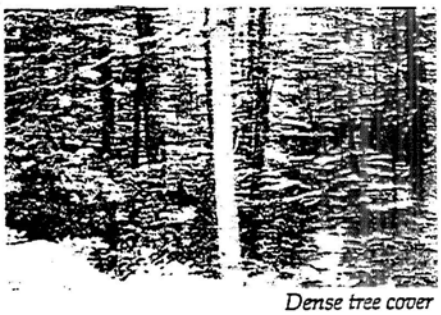
Characteristics:

ARCHITECTURE

- No buildings or facilities exist in this area.

OPEN SPACE/LANDSCAPE

- Dense tree cover and wetlands.
- Steep topography.
- No substantial infrastructure.



Dense tree cover

Assets:

ARCHITECTURE

- No architectural assets exist in this area.

OPEN SPACE/LANDSCAPE

- Dense tree cover.
- Rural character.
- Natural setting.

Liabilities:

ARCHITECTURE

- No architectural precedents exist in this thematic area.

OPEN SPACE/LANDSCAPE

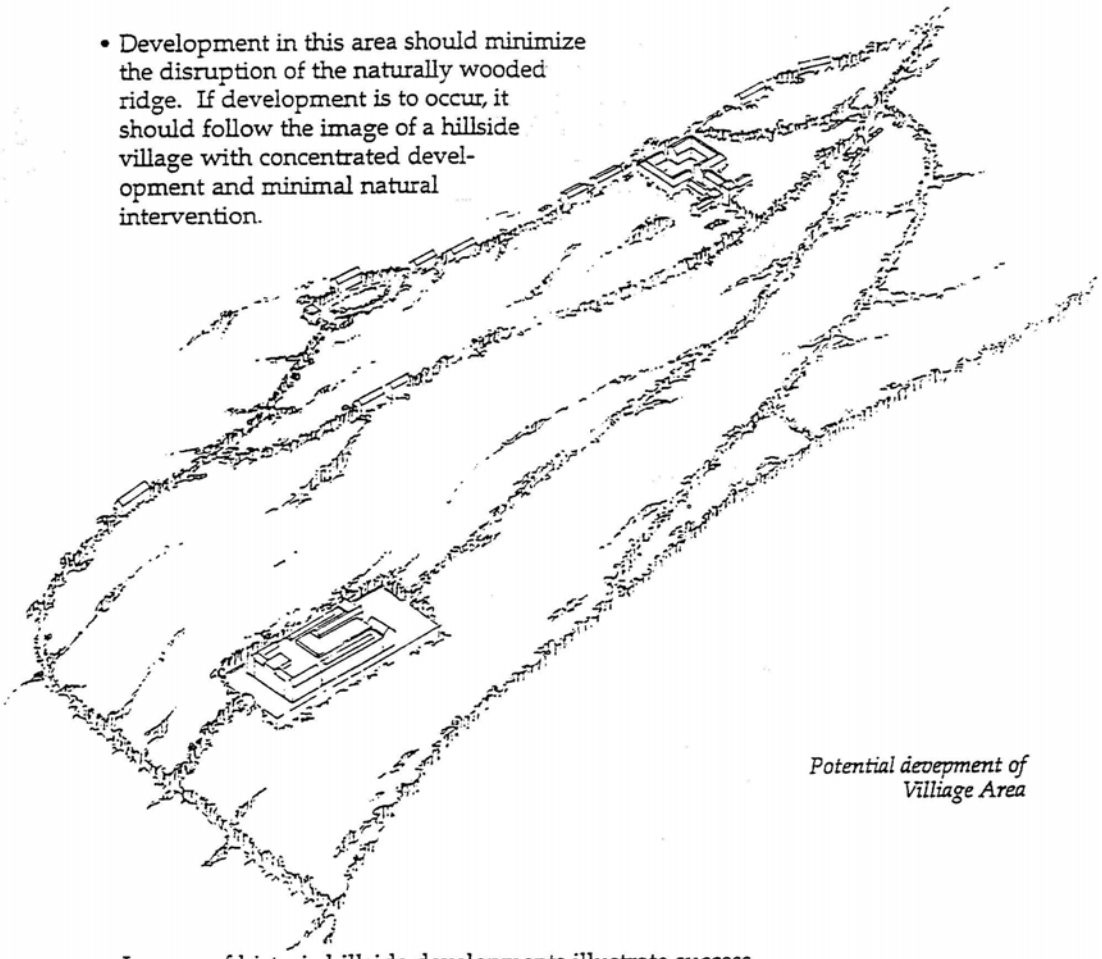
- Steep slopes.
- Dense tree cover.
- Lack of infrastructure.
- Wetlands and natural habitats.

Recommendations:

- Since this area has not been developed and dense tree cover has retained a natural setting, recommendations for design guidelines are based on an environmentally sensitive approach to future planning.

AII13-86

- Development in this area should minimize the disruption of the naturally wooded ridge. If development is to occur, it should follow the image of a hillside village with concentrated development and minimal natural intervention.



Potential devepment of Villiage Area

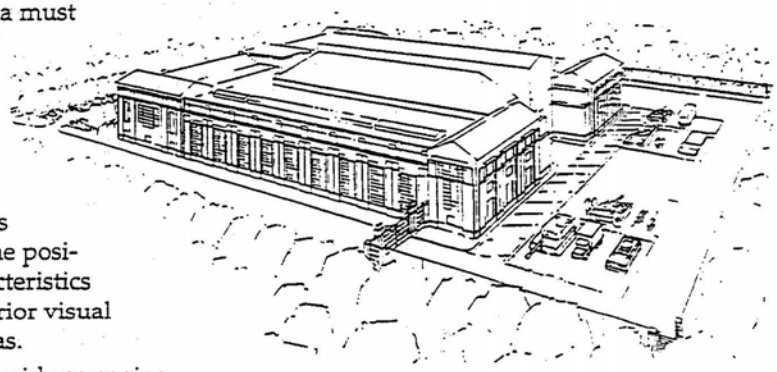
- Images of historic hillside developments illustrate successful solutions that are responsive to their difficult context. Topography, although constraining, is an asset that can add visual interest and create a special identity as well as a sense of place. Topographic constraints can present imageable development opportunities.

Historic example, hillside village

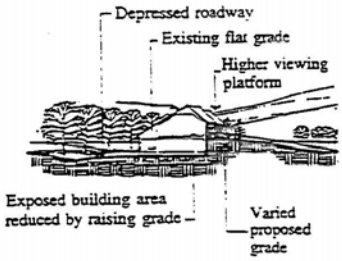
Example, street wall and topography Harpers Ferry, W.V.

DTIC · 87

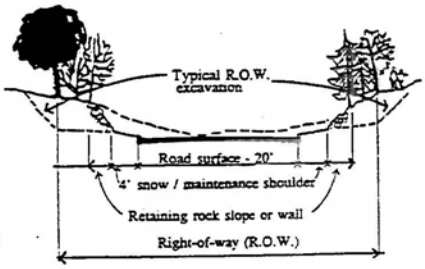
- The high-density campus core is the most efficient method to minimize sprawl. Some smaller buildings (Plan Type 1) may be placed parallel to the curved roads which are shaped by topography.
- All buildings in this area must use masonry. Architectural designs and details are important in this area since it presents a first impression to anyone entering Picatinny Arsenal. Cues should be taken from the positive architectural characteristics present in each of the prior visual zones and thematic areas.
- Wooded areas are to provide screening for all future development.
- Tree preservation should be a priority in site development. Large planting islands of native vegetation should be used in parking areas to break up expanses of pavement and provide consistency with the surrounding natural wooded areas. Trees are the greatest visual as well as environmental asset in the area. Care should be taken during construction to protect the root systems of adjacent trees.
- The use of existing trees, wherever possible, will enhance the image of the proposed development as well as help maintain the woodlands image.
- Through careful site planning, natural site elements can be used advantageously in parking areas (i.e., existing trees, topography, rock outcroppings and retaining walls constructed with stones or boulders similar to those found on site).
- Brick or natural stone should be used in retaining walls to convey a natural character.
- Parking areas can be laid out to preserve the maximum number of existing large trees. A tree survey should be compiled to inventory the location, species, size and condition of existing trees prior to site planning. A series of smaller parking lots shall be planned instead of a large central lot.



Proposed ASEC Facility



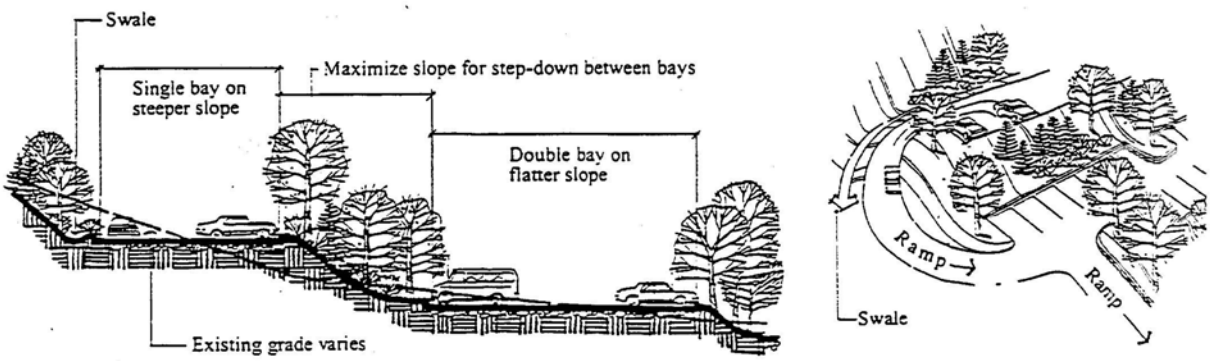
Site devopment diagram



Roadway devopment diagram

4713-86

- Alternate paving materials are encouraged in this thematic area due to its sensative environment (see III.2-3). Large areas of continuous surface parking are discouraged and are, in fact, cost prohibitive due to topography. Parking layouts can work with constraints in topography through the use of terraced parking bays.
- Building Types B, H, J, and Site Plan Types 3 and 4 are proposed for this thematic area.



Parking area diagrams

ATTS - 89

III. Design Guidelines

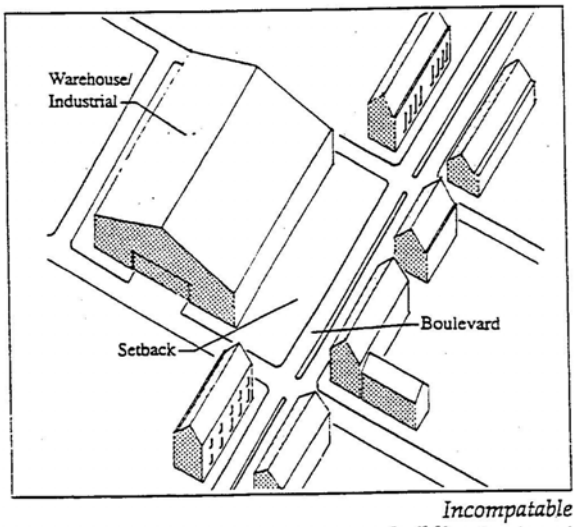
III.1 BUILDINGS

III.1-1 BUILDING TYPES

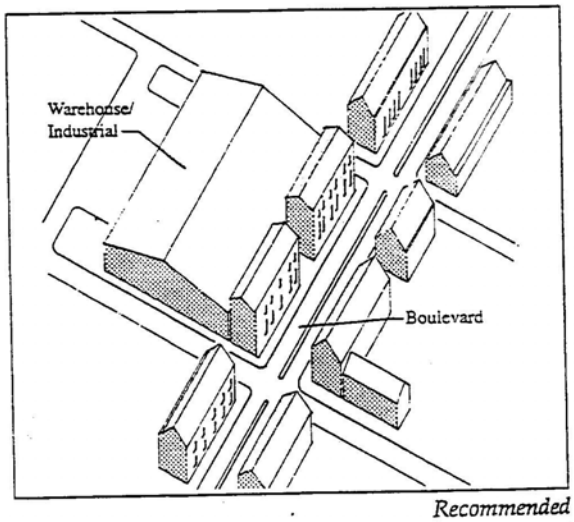
The objective of this section is to provide general design guidance regarding the exterior appearance of buildings at Picatinny Arsenal. Sketches of building types identified in this section represent the acceptable palette of architectural vocabulary rather than specific building designs to be copied in detail.

The siting of future buildings within a visual zone or thematic area is controlled by the general criteria of each area. The proposed area plans for the Visual Zones identified as Downtown, PM Row and Navy Hill provides guidance for the placement of the edge (facade) of future structures (Refer to Chapter II). This guidance is based on factors such as the street hierarchy and setback requirements as well as the type of public space that the new building defines.

The scale and architectural articulations and details are also a function of the street type and building fronts. For example, if a utilitarian structure such as a warehouse or an industrial facility is sited along an important boulevard, the facade facing the boulevard must reflect an appropriate mass and compatible architectural details (see diagram below).



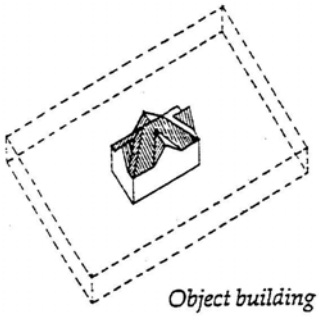
Incompatable building treatment



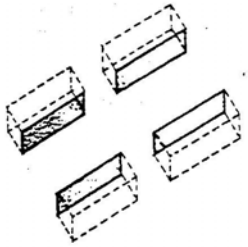
Recommended building treatment

AT 13-90

The concept of space-defining buildings versus object buildings must be considered carefully prior to siting any new facility. This greatly impacts the cost and the exterior treatment of the building.



Object building



Edge-defining building

A space- (or edge-) defining building responds to specific street edge(s), thus offering cost savings. The savings are due to the required emphasis on one or two facades, as related to a street edge or adjacent structures, rather than all four elevations. On the other hand, object buildings in a suburban or rural setting must provide uniform architectural treatment for all four elevations.

Ten building types are identified in this section. Due to their shape, most buildings can accommodate numerous uses, with the exception of towers and some research and development facilities that are designed for a specific use.

It is crucial to emphasize the separation between visual zones and land use zones. A visual zone may consist of multiple land use zones; therefore, various building types may be assigned to each thematic area that makes up the visual zone.

Regardless of building type or use, all buildings must respect the context and architectural vernacular of Picatinny Arsenal. The following matrix illustrates the ten building types as related to the six visual zones and other architectural criteria.

BUILDING TYPES & ARCHITECTURAL ELEMENTS

PROGRAM SUMMARY	BUILDING TYPE									
	A	B	C	D	E	F	G	H	I	J
Building Size (sf)	70,000-200,000	15,000-70,000	2,000-15,000	5,000-30,000	15,000-40,000*	1,500-2,500	4,000-30,000	varies	varies	varies
Height	2-4 stories	2-3 stories	1-2 stories	50 (feet) max.	2-3 stories	2-3 stories	1-2 stories	varies	varies	varies
Length (feet)	100-300	varies	60-150	75-300	75-150	30'/ unit	varies	varies	varies	varies
Width (feet)	80 max.	varies	30-50	120 max.	30-50	45 max.	varies	varies	varies	varies
Zones Allowed**	II	I, II, III, IV, VI	II, III, IV, V	II, IV, V	IV	IV	II, IV	II, IV, V, VI	I, II, IV	II, IV, V, VI
Uses Allowed	Administration, Education, Offices	Administration, Education, Offices	Office, Storage, Industrial	Industrial Warehouse, Education	Residential Apts. Commercial, Administration	Residential Apts., Industrial	Recreation	varies	Residential	R & D

*15 - 30 d.u. (duplex unit)
**Refer to each thematic area sub-section in chapter II for specific building types in that area

ARCHITECTURAL ELEMENTS	BUILDING TYPE									
	A	B	C	D	E	F	G	H	I	J
Plan type	1, 2	1	1, 2	1, 2	1, 2	1, 2	1, 2	2	1, 2	1, 2
Massing type	1, 2	1, 2	1, 2	1, 2, 3	1, 2	1, 2	1, 2, 3	N/A	1, 2, 3	1, 2, 3
Roof Form type	1, 2	1, 2	1, 2, 3	1, 3	1, 2	1, 2	1, 2, 3	N/A	1, 2	1, 2, 3
Elevation type	1, 2, 3	1, 2, 3	1, 3	2	1, 3	1, 3	1, 2, 3	N/A	1, 3	1, 2
Fenestration type	1	1	1, 2	1, 2	1	1	1, 2	N/A	1	1, 2
Site Plan type	1, 2, 4	1, 2, 3, 4, 5	2, 3, 4, 5	2, 4, 5	1, 3	1, 3	1, 2, 3, 4, 5	4, 5	3, 4	1, 2, 3, 4, 5
Materials	brick, stone, precast conc.	brick, stone, precast conc.	brick, stone, CMU	precast conc., CMU	brick, stone, precast conc.	brick	brick, stone, precast conc. CMU, wood ***	varies	wood, masonry	masonry

***Wood construction is permitted for smaller facilities only

AH13-92

Building Type A

Building Type A provides a model for facilities that contain important administrative functions. Important characteristics of the building include symmetrical massing and plan shape, and a prominent single, formal entry at the center of the building.

The building consists of a well-proportioned building mass with simple vertically proportioned fenestration, well-detailed brickwork, and a clear statement of base and cornice.

PROGRAM SUMMARY

Building Size (sf):	70,000-200,000
Building Height:	2-4 stories
Building Length (feet):	100-300
Building Width (feet):	80' maximum
Zones Allowed**:	II
Uses Allowed:	Administration Education Office

***Refer to each thematic area sub-section in chapter II for specific building types in that area*

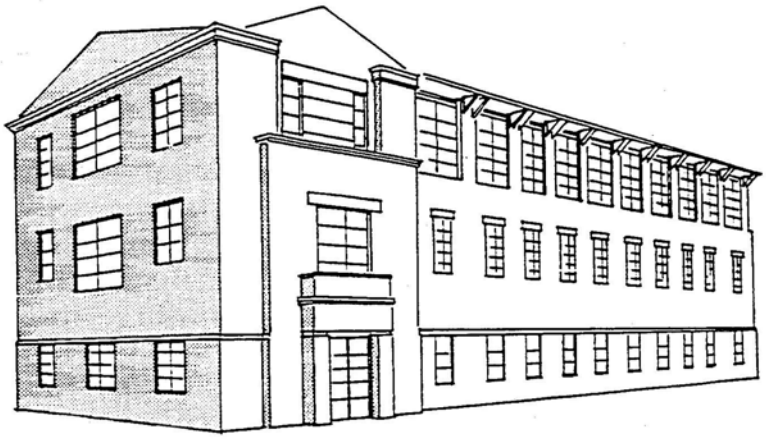
ARCHITECTURAL ELEMENTS

ELEMENT	TYPE
Plan Types:	1, 2
Massing Types:	1, 2
Roof Form Types:	1, 2
Elevation Types:	1, 2, 3
Fenestration Types:	1
Site Plan Types:	1, 2, 4
Materials:	Brick Stone Precast Concrete

AN13 -93

Building Type B

Building Type B is similar to Building Type A but is intended for smaller users. Building Type B consists of a clearly defined base or cornice, gabled roof and rectangular plan shapes. This building type may consist of 2 or 3 stories.



PROGRAM SUMMARY

Building Size (sf):	15,000-70,000
Building Height:	2-3 stories
Building Length (feet):	varies
Building Width (feet):	varies
Zones Allowed**:	I, II, III, IV, VI
Uses Allowed:	Administration
	Education
	Office

***Refer to each thematic area sub-section in chapter II for specific building types in that area*

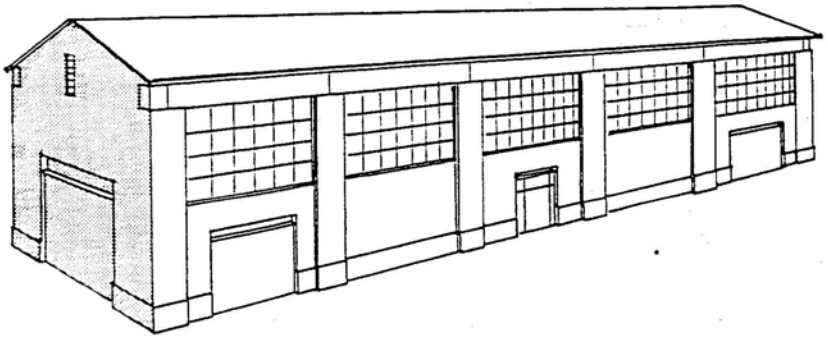
ARCHITECTURAL ELEMENTS

ELEMENT	TYPE
Plan Types:	1
Massing Types:	1, 2
Roof Form Types:	1, 2
Elevation Types:	1, 2, 3
Fenestration Types:	1
Site Plan Types:	1, 2, 3, 4, 5
Materials:	Brick
	Stone
	Precast Concrete

AT13-94

Building Type C

Building Type C is a rectangle with no attachments or protrusions. Building Type C may accommodate industrial, storage and office uses.



PROGRAM SUMMARY

Building Size (sf):	2,000-15,000
Building Height:	1-2 stories
Building Length (feet):	60-150
Building Width (feet):	30-50
Zones Allowed**:	II, III, IV, V
Uses Allowed:	Office Storage Industrial

***Refer to each thematic area sub-section in chapter II for specific building types in that area*

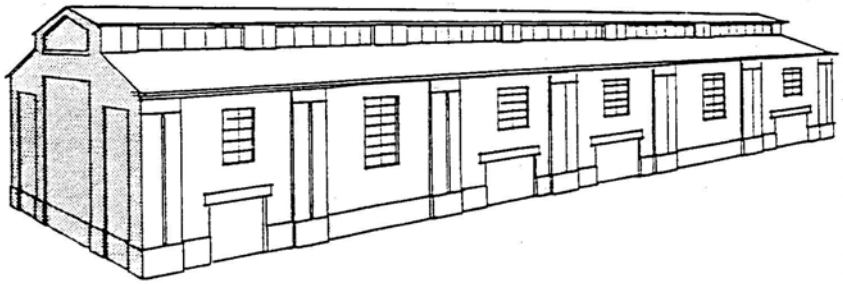
ARCHITECTURAL ELEMENTS

ELEMENT	TYPE
Plan Types:	1, 2
Massing Types:	1, 2
Roof Form Types:	1, 2, 3
Elevation Types:	1, 3
Fenestration Types:	1, 2
Site Plan Types:	2, 3, 4, 5
Materials:	Brick Stone CMU

AH 13-95

Building Type D

Building Type D is a large, utilitarian structure to be used for storage or other industrial uses. Building Type D utilizes a repeated bay elevation to establish a rhythm and define a scale.



PROGRAM SUMMARY

Building Size (sf):	5,000-30,000
Building Height (feet):	50' maximum
Building Length (feet):	75-300
Building Width (feet):	120' maximum
Zones Allowed**:	II, IV, V
Uses Allowed:	Industrial Warehouse

***Refer to each thematic area sub-section in chapter II for specific building types in that area*

ARCHITECTURAL ELEMENTS

ELEMENT	TYPE
Plan Types:	1, 2
Massing Types:	1, 2, 3
Roof Form Types:	1, 3
Elevation Types:	2
Fenestration Types:	1, 2
Site Plan Types:	2, 4, 5
Materials:	Precast Concrete CMU

ATT 13-96

Building Type E

Building Type E is a multi-unit apartment building. This type offers a formal front entry to the building with direct walk-up option to the ground level units.

PROGRAM SUMMARY

Building Size (sf):	15,000-40,000*
Building Height:	2-3 stories
Building Length (feet):	75-150
Building Width (feet):	30-50
Zones Allowed**:	IV
Uses Allowed:	Residential Appartments

**15 - 30 d.u. (duplex unit)*
***Refer to each thematic area sub-section in chapter II for specific building types in that area*

ARCHITECTURAL ELEMENTS

ELEMENT	TYPE
Plan Types:	1, 2
Massing Types:	1, 2
Roof Form Types:	1, 2
Elevation Types:	1, 3
Fenestration Types:	1
Site Plan Types:	1, 3
Materials:	Brick
	Stone
	Precast Concrete

A# 13-97

Building Type F

Building Type F is a townhouse. This type provides the identity of single-family homes without the associated cost. Each unit has an individual, public street entrance and a private entrance and yard at the rear. Parking is at the rear of the building.

PROGRAM SUMMARY

Building Size (sf):	1,500-2,500
Building Height:	2-3 stories
Building Length (feet):	30' / unit
Building Width (feet):	45' maximum
Zones Allowed**:	IV
Uses Allowed:	Residential Apartments

***Refer to each thematic area sub-section in chapter II for specific building types in that area*

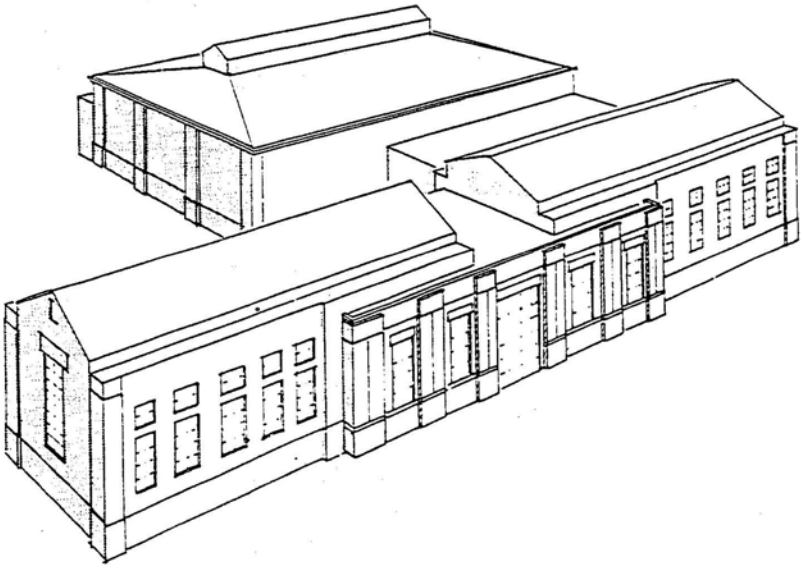
ARCHITECTURAL ELEMENTS

ELEMENT	TYPE
Plan Types:	1, 2
Massing Types:	1, 2
Roof Form Types:	1, 2
Elevation Types:	1, 3
Fenestration Types:	1
Site Plan Types:	1, 3
Materials:	Brick

A#13-98

Building Type G

Building Type G accommodates various programs and functions that relate to community, education, or recreation. Portions of the building facing streets and within public view must provide a compatible scale to the street.



PROGRAM SUMMARY

Building Size (sf):	4,000-30,000
Building Height:	1-2 stories
Building Length (feet):	varies
Building Width (feet):	varies
Zones Allowed**:	II, IV
Uses Allowed:	Recreation Commercial Education

***Refer to each thematic area sub-section in chapter II for specific building types in that area*

ARCHITECTURAL ELEMENTS

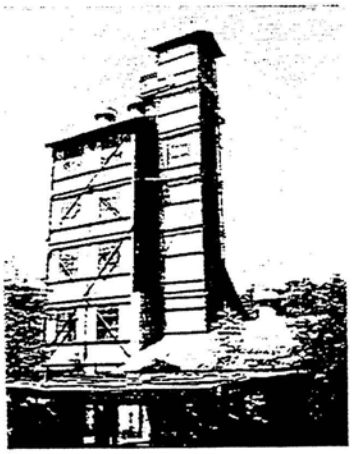
ELEMENT	TYPE
Plan Types:	1, 2
Massing Types:	1, 2, 3
Roof Form Types:	1, 2, 3
Elevation Types:	1, 2, 3
Fenestration Types:	1, 2
Site Plan Types:	1, 2, 3, 4, 5
Materials:	Brick, Stone Precast Concrete, CMU, Wood***

****Wood construction is permitted for smaller facilities only*

A413-99

Building Type H

Building Type H defines numerous tower structures throughout the installation. An aesthetic characteristic that is industrial in nature is distinct in some of the older structures, most of which are no longer in service due to the change in the mission of Picatinny Arsenal (from production to research and development). These towers contribute to the skyline profile and provide landmarks throughout the installation.



PROGRAM SUMMARY

Building Size (sf):	varies
Building Height:	varies
Building Length (feet):	varies
Building Width (feet):	varies
Zones Allowed**:	II, IV, V, VI
Uses Allowed:	varies

***Refer to each thematic area sub-section in chapter II for specific building types in that area*

ARCHITECTURAL ELEMENTS

ELEMENT	TYPE
Plan Types:	2
Massing Types:	N/A
Roof Form Types:	N/A
Elevation Types:	N/A
Fenestration Types:	N/A
Site Plan Types:	4, 5
Materials:	varies

ATT13-100

Building Type I

Building Type I is the single-family residential unit. There is a great diversity in character within this type based on the time of construction and location of the development.

Some of the Building Type I structures are historically significant dwellings such as the residences of the Commander (Building 112) and the Chief of Staff (Building 114) and the old Navy Commander's house (Building 3250). Residential dwellings are also found along Parker Road in limited quantity.

PROGRAM SUMMARY

Building Size (sf):	varies
Building Height:	varies
Building Length (feet):	varies
Building Width (feet):	varies
Zones Allowed**:	I, II, IV
Uses Allowed:	Residential

***Refer to each thematic area sub-section in chapter II for specific building types in that area*

ARCHITECTURAL ELEMENTS

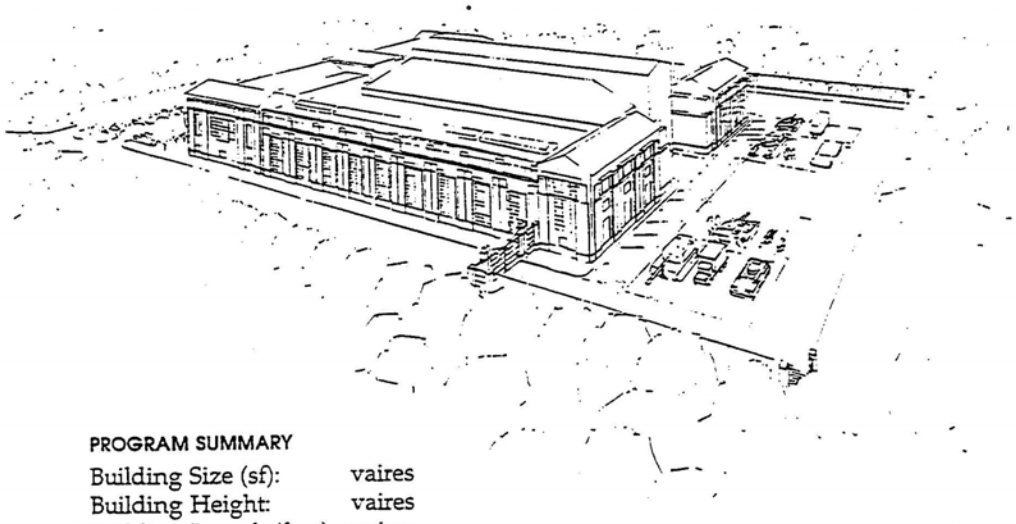
ELEMENT	TYPE
Plan Types:	1, 2
Massing Types:	1, 2, 3
Roof Form Types:	1, 2
Elevation Types:	1, 3
Fenestration Types:	1
Site Plan Types:	3, 4
Materials:	Wood
	Masonry

DTI 13-101

Building Type J

Building Type J defines research and development buildings and some industrial buildings that have designs specific to their function. No specific building characteristics were defined for these specialized facilities because of their unique form requirements.

The exterior treatment for future facilities of this type will depend greatly on their location within the installation for design guidance. They should respond to the exterior requirements of the visual zone and the thematic area in which they occur. Currently planned research and development facilities (such as the Armament Software Engineering Center) are in this category and, therefore, must comply with thematic area requirements.



PROGRAM SUMMARY

Building Size (sf):	vaires
Building Height:	vaires
Building Length (feet):	vaires
Building Width (feet):	vaires
Zones Allowed**:	II, IV, V, VI
Uses Allowed:	Industrial Administration

***Refer to each thematic area sub-section in chapter II for specific building types in that area*

ARCHITECTURAL ELEMENTS

ELEMENT	TYPE
Plan Types:	1, 2
Massing Types:	1, 2, 3
Roof Form Types:	1, 2, 3
Elevation Types:	1, 2
Fenestration Types:	1, 2
Site Plan Types:	1, 2, 3, 4, 5
Materials:	Masonry

ATB-102

III.1-2 SITE PLAN TYPES

There are five site plan types identified at Picatinny Arsenal.

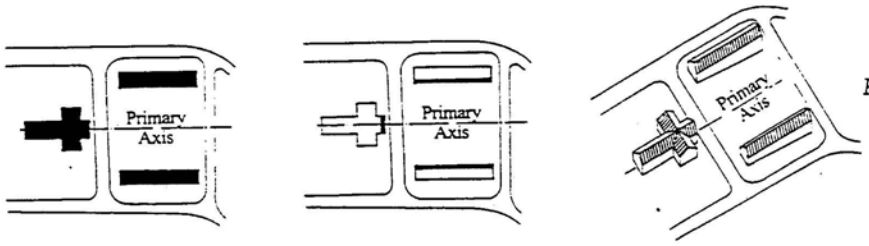
Site Plan Type 1: Formal/Axial

Site Plan Type 1 is a formal arrangement that relies on a rectilinear arrangement of buildings related in a campus setting. The buildings are typically arranged about a primary axis that reinforces the geometry of the site. This geometry cuts across the entire site or at least the most prominent building. Traditionally, this site plan form was called a quadrangle. The IDG uses the quadrangle (quad) term in the narrative but the less traditional formal/axial term in the heading. This is done in order to invoke the axial symmetry of this site plan type without the full enclosure implied in the more traditional quadrangle form.

The axial arrangement typically establishes a hierarchy of buildings or sites depending on their location in relation to the axis. Another important characteristic of this site plan type is the orientation of the buildings that create the quadrangle. All building fronts are oriented inward toward the primary axis and are used to define the edge of a central public space (courtyard).

The characteristics for Site Plan Type 1 include:

- Axial organization of buildings and public spaces.
- Hierarchy of buildings and open space.
- Building size relates to position in hierarchy.
- Building fronts face the primary axis.
- Bilateral symmetry.



Formal/Axial

AH 13-103

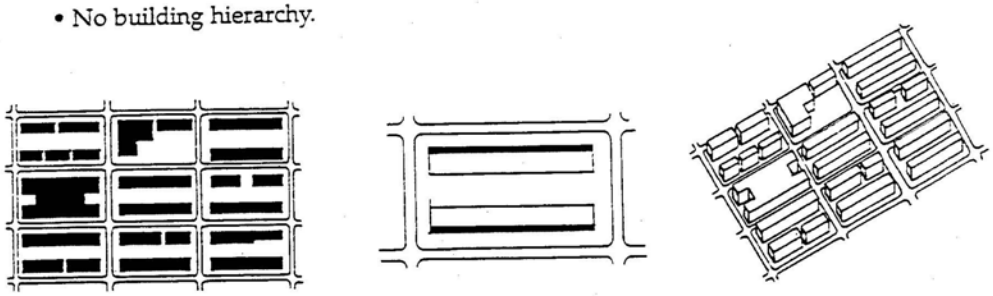
Site Plan Type 2: Grid

Site Plan Type 2 is a grid form of individual parcels or blocks on an orthogonal system with varying regularity as determined by the consistency in the size of its blocks. The grid system implies no hierarchy and provides equal importance on a two-dimensional basis to all blocks. Hierarchy is typically achieved through the mass of the buildings within the grid or by strategically breaking the grid or varying the block size. The grid site plan type occurs in this way in the downtown area of Picatinny Arsenal.

An important characteristic of the grid site plan type is that all building fronts are oriented outward toward the perimeter of the block facing the street. Service access or courtyard arrangements, when allowed, are the exceptions to this rule.

This site plan type is most often associated with urban areas. The characteristics for Site Plan Type 2 include:

- Streets organized by a grid.
- Typical buildings are uniform in size and mass.
- Buildings are oriented outward facing the street and defining a street edge.
- No building hierarchy.



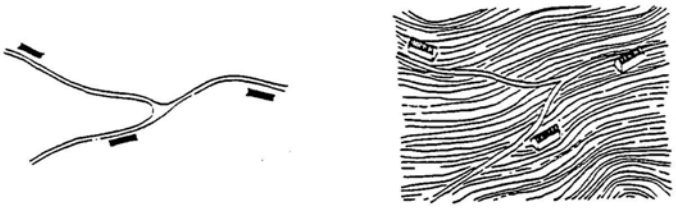
Grid

ATT 13 · 104

Site Plan Type 3: Natural Topography

Site Plan Type 3 is typically found in residential developments and in areas of difficult topography. The road layout that defines the site responds to natural features such as contours, vegetation, and soil conditions. Buildings of this plan type are oriented toward the street. Characteristics for this site plan type include:

- Linear or curvilinear road layout which responds to topography or natural land features.
- Uniform buildings, typically linear in shape and comparable in size, height and form.
- No hierarchy of buildings or open space.

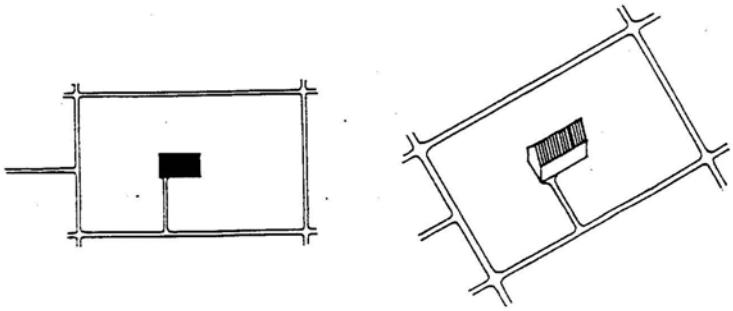


Natural Topography

Site Plan Type 4: Object in Space

Site Plan Type 4 consists of individual buildings or groupings of buildings which are figural objects surrounded by open space. These buildings are typically set in the central zone of a proportionately larger site. The buildings often consist of large rectangular volumes that contrast their immediate surroundings and interrupt the horizon. The open space in this site plan type typically has no relationship to the object building and therefore is undefined. Characteristics for this site plan type include:

- Building form that interrupts the horizon.
- Individual buildings are often located central to a proportionately larger site.
- Buildings are set away from roads and parking areas.



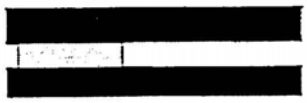
Object in Space

AA12-105

Site Plan Type 5: Infill

Site Plan Type 5 represents infill opportunities that have or can occur in any visual zone. An example of existing infill can be found at Buildings 350 and 351 where, in each case, two parallel structures have been joined together to form one larger building. Two other variations of this site plan type occur at Building 3024 and Building 908, where incremental expansion resulted in the current building configurations. Characteristics for this site plan type include the following:

- Irregular building shapes and massing.
- Opportunities to define open space.
- Building shapes and sizes that respond to program changes.



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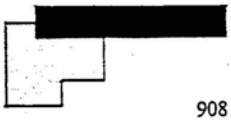
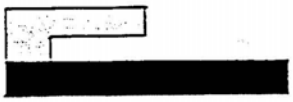


908

Infill



3024

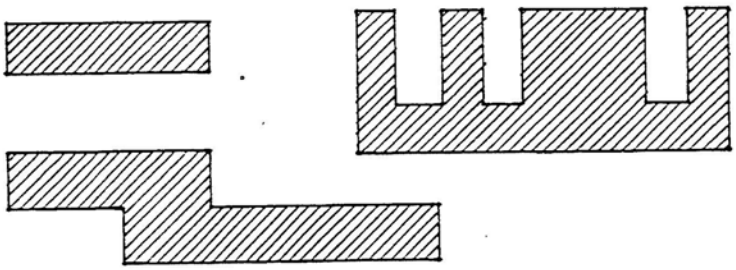
AII 13-106

III.1-3 PLAN TYPES

Two plan types are considered appropriate for all thematic areas and visual zones on Picatinny Arsenal. The selection of these two plan types is based on an analysis of the geometry and spatial organization of various building plans at Picatinny Arsenal.

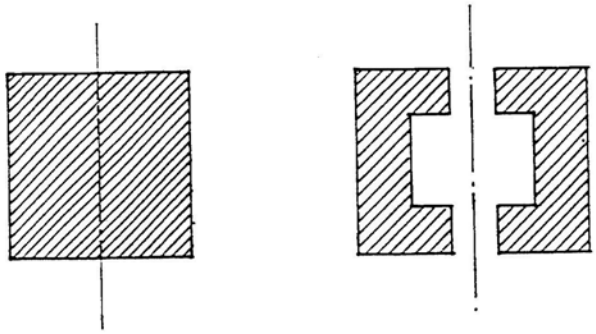
Type 1: Linear

- Simple rectangular footprint.
- Basic geometric shape.
- Small projections can be added without major alteration to the purity of the shape.



Type 2: Central

- A simple block or series of simple blocks organized around a central and dominant form or focal point.
- The central core of this plan type can be a prominent interior space, a taller architectural element (solid), or a simple courtyard (void).
- Simple geometric shape (i.e., square, circle, etc.).



AII 13-107

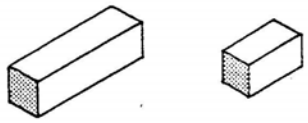
III.1-4 MASSING TYPES

Building mass is the perceptual form of a structure seen as a totality. Massing types are developed to identify a building's three-dimensional geometry.

Public space is typically defined through building mass; therefore, buildings must relate to the massing of adjacent structures. Three massing types are identified for Picatinny Arsenal.

Type 1: Simple Block

- Simple (primary) mass, typically uniform in height.
- Minor variations are acceptable.

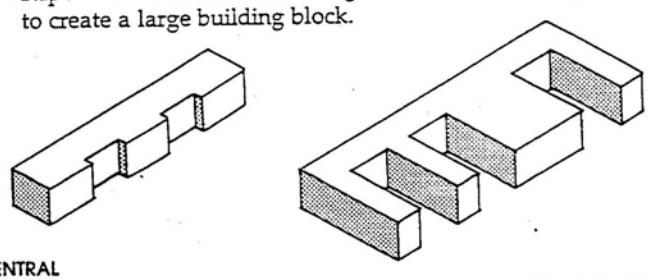


Type 2: Combined Blocks

- Combined blocks that may vary in height and scale.
- Change in block height is permitted where two different plan types intersect.
- Two combined block types are possible.

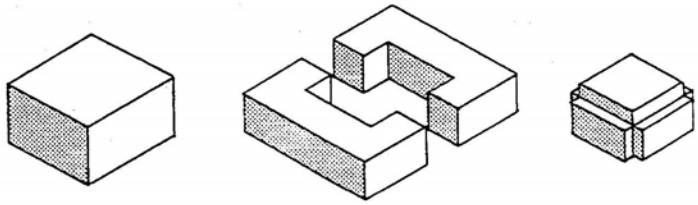
A. LINEAR

- Repetitive rectilinear blocks organized in a linear sequence to create a large building block.



B. CENTRAL

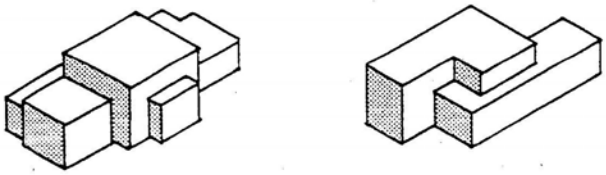
- Consists of a mass organized around a primary block (solid or void).
- Creates a clear hierarchy that emphasizes the central piece.



ATT 12, 116

TYPE 3: CLUSTERED

- Collision of various masses and shapes that results in a composition without a discernible pattern.
- Can be added to over time.
- While expressing a lack of compatibility to the immediate context, such three-dimensional composites become identifiable landmarks.
- Conveys chaos through mass variation.
- This massing type is not recommended unless functionally required.

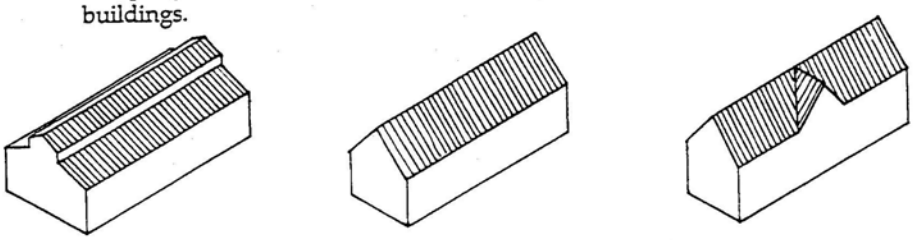


III.1-5 ROOF TYPES

Roof forms can greatly influence the overall character and perception of the mass of buildings. Roof tops and upper floors must, therefore, be designed to create a visual effect that is consistent with the architectural vernacular of the thematic area, visual zone, and Picatinny Arsenal. Three roof types are identified at Picatinny Arsenal. All three support any of the building types recommended for the installation, although flat roofs (Type 3) must not be used for new buildings unless required specifically by the mission.

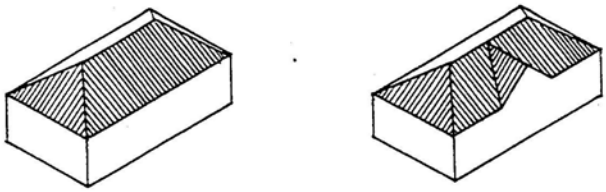
Type 1: Gabled Roof

- Responds well to the climatic conditions and maintenance requirements at Picatinny Arsenal.
- Roof slope varies between 6:12 and 12:12. As the building width narrows, the roof pitch may increase.
- Related buildings must have similar roof slopes and form.
- Roof features such as dormers and chimneys are permitted when considered as an integral part of the elevation and fenestration composition.
- Parapet gable ends are allowed, especially in masonry buildings.



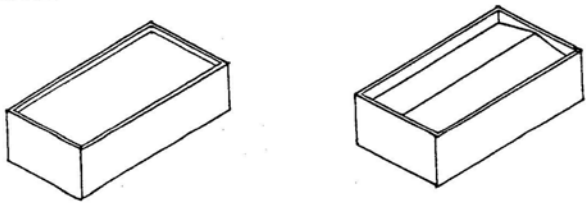
Type 2: Hipped Roof

- Roof slope varies between 6:12 and 12:12.
- Chimneys, dormers and cupolas are encouraged and shall be located based on the composition of the elevation.



Type 3: Flat Roof

- Does not respond well to the climate and is maintenance intensive.
- Slopes between 1:12 and 3:12 are considered flat.

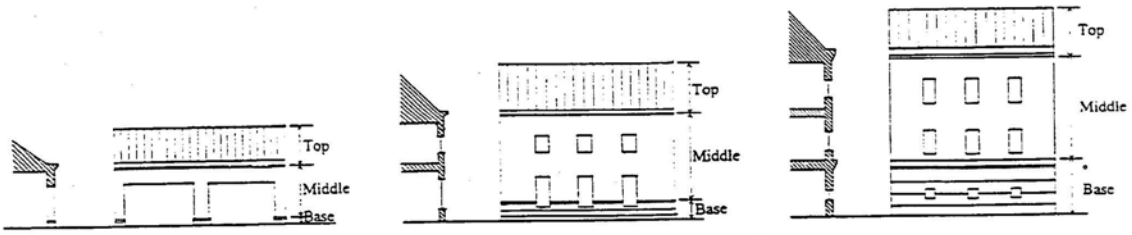


DM13-110

III.1-6 ELEVATION TYPES

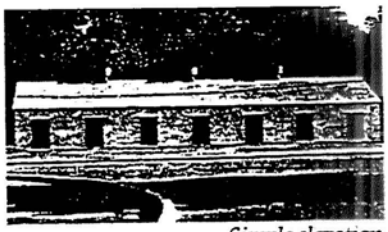
There are three identifiable types of building elevations. An individual building may have a combination of each elevation type.

Regardless of the elevation type, all buildings must be clearly articulated into three horizontal divisions: (1) base, (2) middle, and (3) top. Most of the older structures on the Arsenal provide positive examples of good horizontal articulation.



Type 1: Simple Elevation

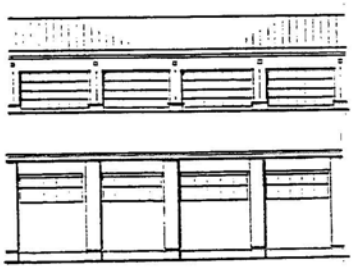
- Symmetrical composition of regularly spaced fenestrations or a simple blank wall (such as the short end elevation of a rectangular plan or a small addition).
- Long blank elevations must appear modulated and be minimized in length when possible.



Simple elevation

Type 2: Repeated Bay

- Long elevations can be modulated through the use of pilasters expressing a repeated structural bay. These bays must be proportionate to the building's mass and elevation.
- Allows for doors and large openings within the building facade, and is especially useful for industrial buildings where the horizontal character of the building is exaggerated due to its low mass.
- This type provides a design tool that controls the visual scale of long buildings and adds architectural interest with minimal cost.



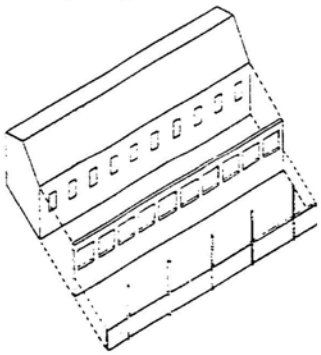
Repeated bay

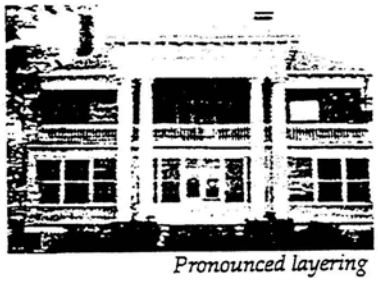
ATTA 3 - 111

Type 3: Layered

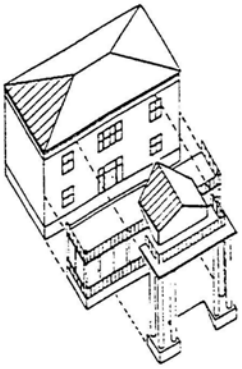
- Multiple layers (planes) add visual richness and create a three-dimensional expression.
- Layers can be subtle, yet cast shadow lines which highlight various planes.
- Hierarchy can be achieved through the use of layers.
- Fenestration composition can be emphasized and long elevations can be modulated through basic layering.

Subtle layering





Pronounced layering



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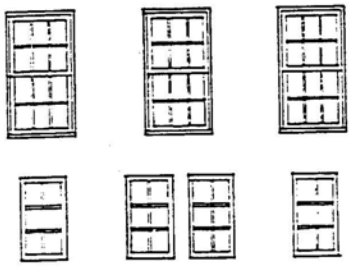
III.1-7 FENESTRATION TYPES

Fenestrations give the building elevation a sense of scale and pattern, and reinforce the building's character while providing functional support in the form of light, ventilation, and entry.

Continuous strip windows on flat facades must not be used due to their incompatibility with the Arsenal's architectural character. Two fenestration types are proposed.

Type 1: Punched Openings

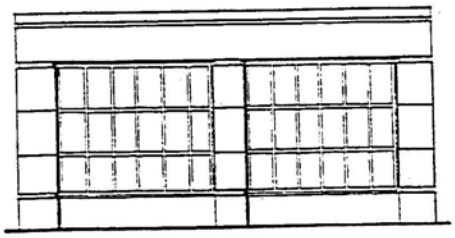
- Total glass area up to 40 percent of exterior wall area.
- Repetitive, identical openings. Variations are permitted to articulate entrances or special functions.
- Patterns can be varied by changing the horizontal spacing or window groupings.
- Openings consist of rectangular shapes which are vertically proportioned.



Type 1: Punched Openings

Type 2: Industrial

- Provides the most flexible glass area in the building elevation (10% to 70%).
- Clerestory type of fenestration is permitted.
- Can be used on commercial buildings.



Type 2: Industrial

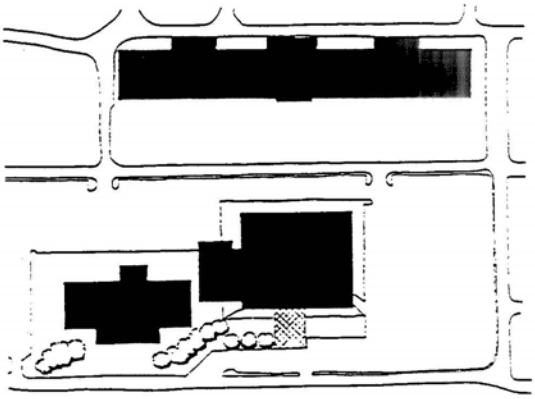
III.2 OPEN SPACE/ LANDSCAPE

III.2-1 PUBLIC OPEN SPACE

General Information

Public open space is defined as an outdoor gathering space used by people to congregate, eat lunch or just pass through. Open spaces may be formal, informal or even ceremonial in character. These spaces provide amenities both visually and functionally for personnel, residents and visitors. Public open spaces may also be used to provide visual relief in urban areas, to accent historic areas or provide transitional zones between dissimilar areas. They are reinforced through the consistent use of design elements such as landscape planting and site furnishings.

At Picatinny Arsenal, public open space is informal in character. It is limited to the picnic area at Lake Denmark, playgrounds in residential areas, the golf course and pool area, and plazas located at a select number of building entrances. There is a need to provide better public spaces within the Downtown, PM Row, and Navy Hill visual zones. These zones represent the most used areas of the installation. Six public open space types are possible on Picatinny Arsenal.



Plaza

PARK

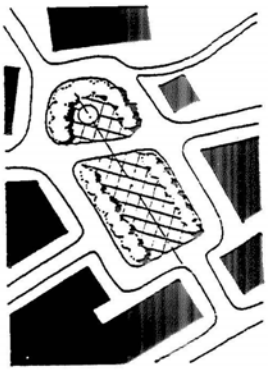
- Outdoor space that is open.
- Consists of regular or irregular geometry and is naturally landscaped.
- A maximum of 10 percent of its area may be paved.

PLAZAS

- Outdoor spaces typically located near major building entrances.
- Usually open but a maximum of 60% enclosure is acceptable.

SQUARE

- Outdoor open space with a clear shape and well-defined edges.
- A minimum enclosure of 60% to a maximum of 80%.
- A minimum of 40% of its area must be paved, typically with brick or stone pavers. Asphalt is not an accepted paving material.

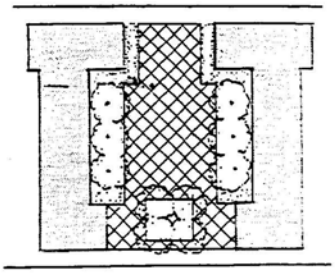


Square

AMB-114

COURTYARDS

- Outdoor spaces enclosed on all sides by buildings, landscaping and/or walls.
- More privacy is provided and their use may be more restrictive since they are enclosed.



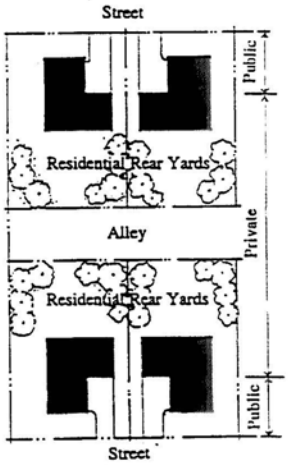
Courtyard

CEREMONIAL GATHERING SPACES

- Outdoor areas used for ceremonial events.
- Surface can either be paved or consist of turf.
- Location near an important building.
- Must be a visual asset when there are no events occurring.

RESIDENTIAL REAR YARDS

- Provide opportunities in multi-family areas for residents to congregate, play and exercise (promotes a sense of community).
- Provide outdoor seating areas for observing activities (e.g., playgrounds).
- Can be linked to other community areas by a trail system.

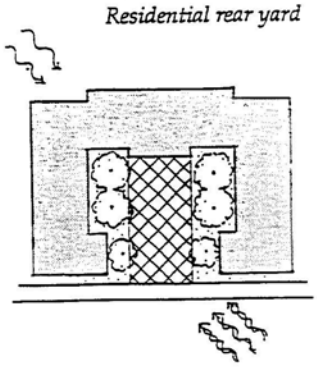


Residential rear yard

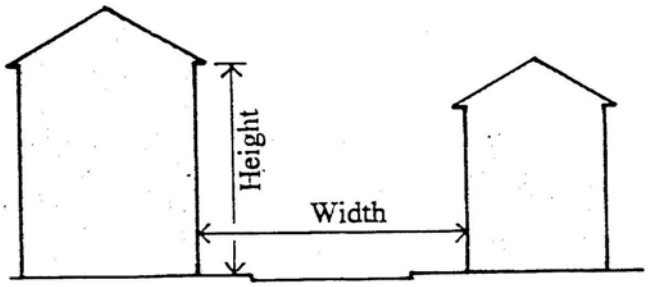
Design Objectives

It is important to provide public open spaces that are well proportioned and can comfortably accommodate intended users.

- Visually coordinate the design of the space with surrounding architecture with regard to details and materials.
- Acceptable height-to-width ratios are 1:1 minimum, 1:6 maximum, and 1:3 optimal.
- Accessible to handicapped users.
- Locate near areas used by large numbers of people.
- Microenvironment shall be considered in the design of the space (i.e., sun, shade, wind, and noise).
- Buffer open space from streets and parking areas.
- Surrounding views and provisions for observing other activity areas must be considered. (People-watching is regarded as a favorite activity in seating areas.)



Microenvironment

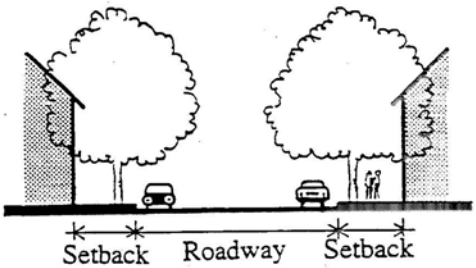


Height to width ratios
1:1 min. - 1:6 max.
1:3 optimal

III.2-2 ROAD SYSTEM

General Information

The road system at Picatinny Arsenal, as anywhere else, is made up of the interconnecting routes of vehicle access. It is composed of paved or unpaved roadways, visual corridors, and tree and building walls that define the various road enclosures. The most familiar aspect of the road system is the roadway itself with its material, number of lanes, design speed, posted speed, and its general condition. The Installation Design Guide (IDG) focuses on the more wholistic aspect of the Arsenal's road system by concentrating on the visual character of each road and how that supports the overall impression of the installation. The design of roads creates visual opportunities which convey the character of the installation.



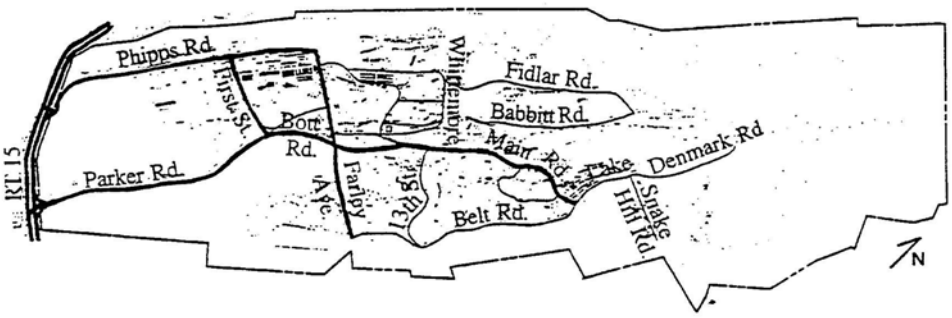
A hierarchy in the road system is typically established by the symbolic importance, location, use, and capacity of a particular road. Design elements such as physical size, landscape treatment, and special details visually reinforce that hierarchy and support definition of the visual zone in which the road is found.

Three levels of road hierarchy are found at Picatinny Arsenal. They consist of primary, secondary and tertiary roads. Each of these levels can be further characterized by the visual assessments of rural, suburban, and urban. The following chart lists the visual zones at Picatinny Arsenal and identifies the visual character associated with each zone. The visual character of the road system in each visual zone is determined by the visual qualities of the individual zone. It should be noted that within each visual zone, more than one type of visual road character may be present.

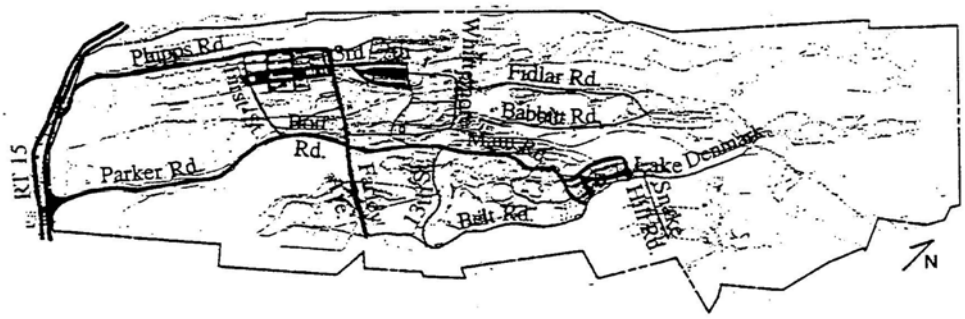
Visual Zone	*Visual Character of Roadway System*		
	RURAL	SUBURBAN	URBAN
The Green	●	●	
Downtown		●	●
PM Row	●	●	●
Navy Hill	●	●	●
The Tracts	●		
The Highlands	●		

ATT 13-116

Road Hierarchy



Existing road hierarchy



Proposed road hierarchy

PRIMARY

Primary roads provide major routes through the installation as well as connections between high use areas. They often traverse the entire installation and carry the heaviest volume of traffic which results in high speed and high visibility corridors. It is cost effective to locate landscape treatment along this type of road as it has the greatest impact on the perception of the installation. Direct access to this type of road by pedestrians should be restricted to crossing at major intersections.

The physical design of the primary roadway typically incorporates large turning radii, straight alignments, and wide pavement sections which can accommodate moderate to high traffic speeds. There should be a clear separation between pedestrian circulation and the edge of the roadway.

Primary roadways are to be designated as boulevards in urban areas and as avenues in rural and suburban areas. Exceptions to the large turning radii, speed, and street parking criteria can be found on urban boulevards.

SECONDARY

Secondary roads provide links between primary and tertiary roadways. In urban settings this road classification is designated as a street and is usually parallel to the primary boulevards. The physical design of streets accommodates slow to moderate traffic speeds. Parking is allowed along secondary streets. There should be a clear separation between pedestrian circulation and the edge of the street. Rural and suburban secondary roadways are to be designated as roads.

TERTIARY

Tertiary roadways link secondary roadways to specific use areas. Due to their physical design, they only accommodate low speed traffic. Sidewalks are usually 3′ wide and can be attached to the curb in urban areas. It is preferable to provide detached walkways along the edge of tertiary roadways whenever possible, especially in suburban settings. Parallel and head-in parking should be permitted, since parked cars act as a buffer and tend to reduce travel speed. Tertiary roadways are typically found in high pedestrian areas. Tertiary roadways are designated as streets or alleys in urban settings and lanes in rural and suburban areas.

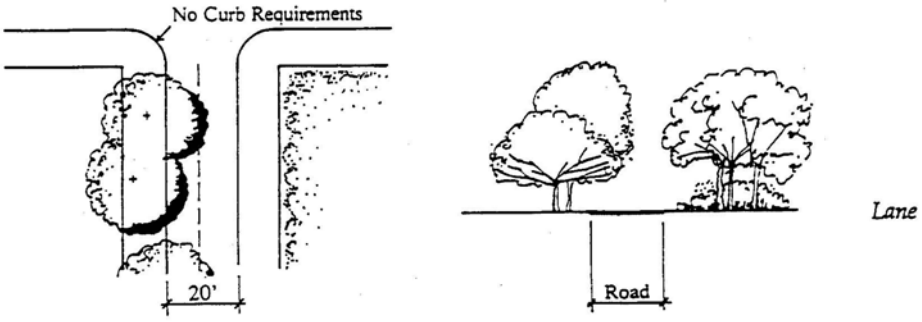
Classification	*Visual Character (Setting)*	
	Urban	Rural/Suburban
Primary	Boulevard	Avenue
Secondary	Main Street/Street	Road
Tertiary	Street/Alley	Lane

AT13-118

Visual Characteristics

RURAL

Rural roadway (lane) sections are primarily found in The Tracts and The Highlands visual zones. The Highlands visual zone conveys natural identity and seasonal interest. Lanes in this zone must support this character. Sidewalks are permitted in the campus areas of The Highlands visual zone but not in The Tracts visual zone. A number of specific guidelines apply to lanes:



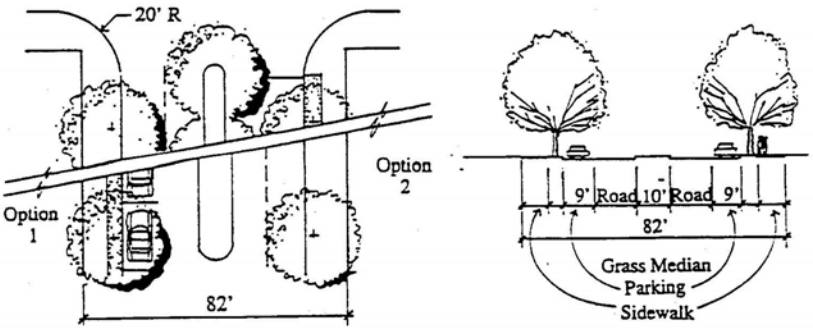
Lane

- Native plant species should be used in any landscape treatment along the lane edges.
- Informal plantings should be encouraged versus formal plantings. (Formal street-tree plantings of native tree species should be limited to primary roadways in dense areas of development.)
- Curbs are not required and may or may not be used according to storm drain designs. (It is preferred that curbing be limited to primary roadways and urban areas.)
- In The Highlands visual zone, formal plantings will only be permitted by special request, and only with the use of continuous planting strips.

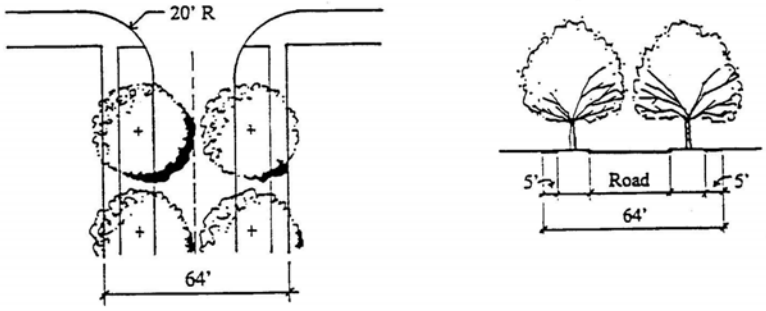
RTT 13·119

SUBURBAN

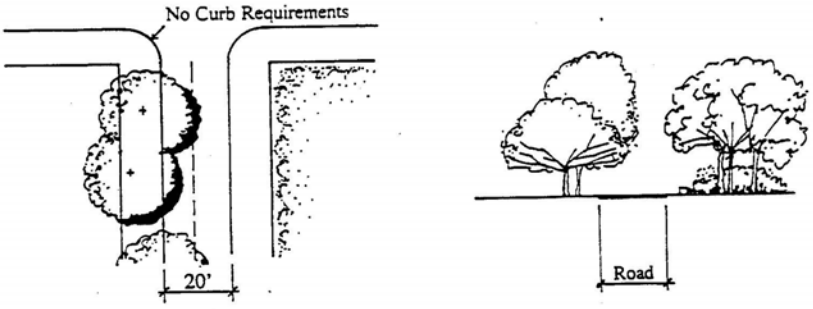
Suburban roadways are found in the Navy Hill, Downtown (Transition/Park), PM Row, and The Green visual zones. Each of these visual zones contains roadway designations that dominate their zones. The Green has mostly rural character roadways, and Navy Hill is predominantly made up of urban and suburban road characteristics. Refer to each of these visual road characteristics for specific design guidelines.



Avenue



Road

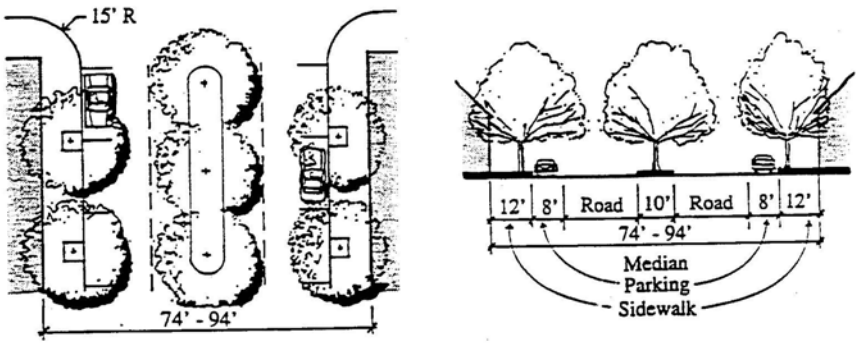


Minor road/lane

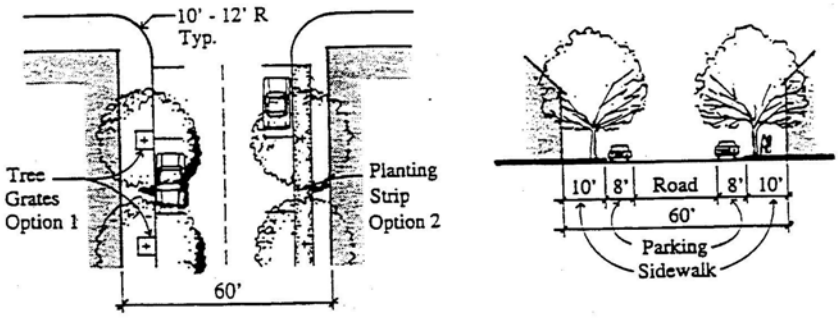
A II 13- 120

URBAN

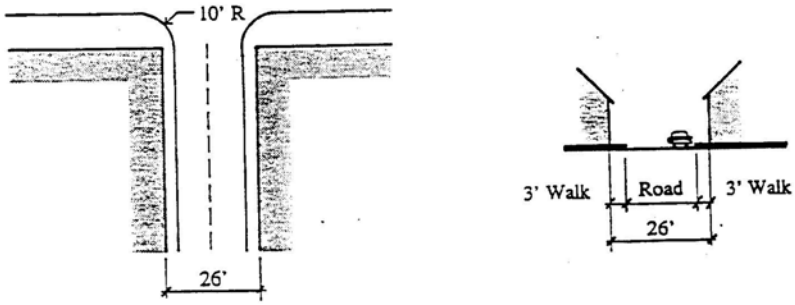
A majority of roadways found in the Downtown, PM Row, and Navy Hill visual zones portray an urban character. A higher level of detail should be used along roadways located in these densely developed areas. These visual zones are high image areas and their road systems should be delineated to reinforce the vitality of the place. It should be noted that there are streets such as Phipps Road in the Downtown visual zone which must continue to portray rural characteristics between the downtown area and the truck entrances. The following design guidelines are provided for urban road characteristics.



Boulevard



Main street/street



Street/alley

ATT 13·121

- It is acceptable to introduce ornamental plant materials which are not native.
- Sidewalks shall be provided. Detached walks are preferable.
- Concrete pavers or pavement markings should be used to delineate pedestrian crosswalks and intersections.
- Formal street-tree plantings should be used along primary and secondary streets.
- Islands may be used for primary boulevards.
- Curbs are required, especially for primary boulevards.

Special Intersections

Due to their high visibility and use, important road intersections should receive special landscape treatment. Landscape treatments at these intersections can also be used to reinforce the hierarchy of the road system, as well as provide points of orientation for the user. Elements such as landscape plantings, signage, ornamental fencing, walls or monuments may be used to highlight the intersection. Appropriate heights should be used within sight triangles to ensure safe views at the intersection.

The following is a list of special street intersections at Picatinny Arsenal which are currently developed or have potential to be developed as special intersections. They are typically strategic intersections in high visibility areas. They occur at the intersections of primary roadways, pedestrian-oriented areas, or at highly used areas. The intersections are listed in priority for each location relative to the installation.

Intersections inside the installation:

- Cannon Gate.
- 3rd Avenue and Farley Avenue.
- Farley Avenue and Bott Road.
- Main Road and center of the Urban Warehouse District and Campus/Educational thematic areas in Navy Hill.
- 17th Avenue and Buffington Road.
- Brown Street and Coughlan Street.

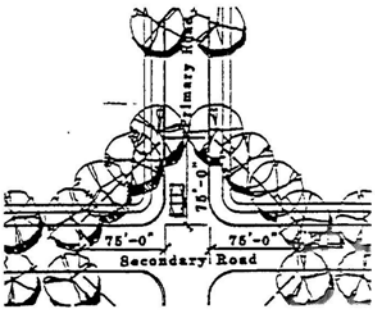
Intersections at the perimeter of the installation:

- Route 15 and Parker Road.
- Route 15 and Phipps Road.
- Lake Denmark Road and Main Road.

ATT 13 - 122

SIGHT TRIANGLE

Provisions for clear sight distances at intersections are required to ensure safety for drivers. Adequate sight distances will permit drivers to see approaching traffic and determine whether it is safe to enter the intersection. This sight triangle shall not be obstructed by trees, utility poles, signs, site furnishings, landscaping, other structures or site features. The area within the sight triangle shall be arranged so that the driver has unobstructed views in the direction of all approaching traffic.

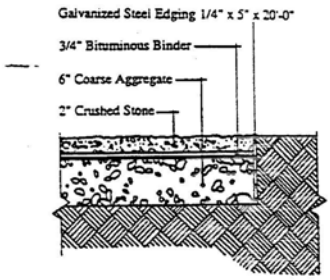


Sight Triangle

III.2-3 PARKING

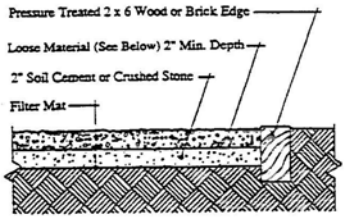
General Information

Parking areas can either be visual opportunities or liabilities in highly developed areas. To ensure that they are used as a visual opportunity, these areas should be considered as part of the entry approach to any building.



Pervious paving detail

Two types of paving materials are permitted for the parking surfaces at Picatinny Arsenal. The first is asphalt and shall be utilized for primary parking lots adjacent to buildings. The second paving material is compacted sand or crushed stone which is pervious and shall be used for overflow parking areas and parking lots in residential areas.

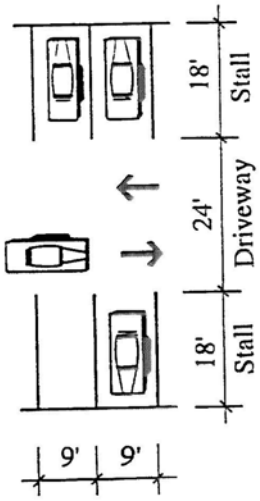


Loose Material Sizes
Wood Chips - 1"
Crushed Stone - 1/2" - 3/4"
Pea Gravel

Pervious paving detail

An appropriate amount of parking spaces is available throughout Picatinny Arsenal. However, in the Downtown visual zone parking areas are poorly delineated from the street system. Proposed landscape plantings and street trees will help define parking edges in this zone. In other parts of the installation parking occurs in designated areas near the buildings they serve.

The parking layout at the Officers' Club is an example of an unsafe situation. Cars backing directly onto Buffington Road create a traffic conflict. Buffington Road essentially has become part of the adjacent parking lot (see II.3-3 for recommendations). A number of additional parking area problems have been identified by the IDG. The following general guidelines can help alleviate many of the design and aesthetic problems associated with the Arsenal's parking areas:



Parking Requirements

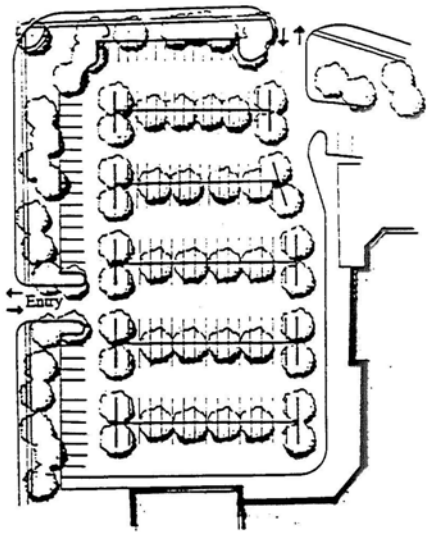
- A 90-degree parking layout is the preferred orientation of parking spaces. This layout provides for efficient circulation and will yield the maximum number of parking spaces.
- Locate employee parking at the rear of a building whenever possible in order to provide a more aesthetically pleasing visual approach to a building. Parking may be located in front of the building when convenience to visitors is of prime importance.
- Use street parking, especially in urban areas, to reduce speed and act as a buffer between pedestrians and street traffic.
- Provide safe and accessible pedestrian circulation through and around parking areas. Eye contact between pedestrians and drivers yields a safer environment.
- Establish a clear visual and physical separation between street and parking areas.

AT 13-124

- Provide parking spaces for the handicapped.
- Parking stall dimensions shall not exceed 9 ft. by 18 ft. for 90° parking (without overhang). Aisles and access lanes shall be 24 ft. wide, as required by the Department of the Army *Architectural and Engineering Instructions, Design Criteria.*
- Share parking lots whenever possible between facilities with different operating hours or within a general vicinity. This will help reduce expansive paved areas that are left vacant for a portion of the day.
- Consideration should be made for the fact that parking lot users are more likely to park farther away from a building if adequate sidewalks and site amenities are provided.
- For parking in residential areas, a minimum distance of 15' should be maintained between parking lots and buildings to allow for planting and walkways.

Access Points

- Access points to parking areas should be clearly expressed and controlled.
- Parking lot entries should respond to the building's entrance and importance. For example, the parking lot entry at Building 1 should appear special to inform users that they are at the Installation Headquarters for Picatinny Arsenal.

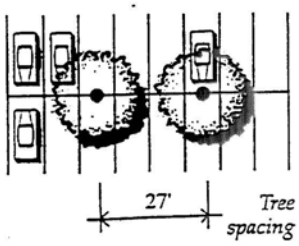


Typical parking layout

Landscaping

Landscaping shall be provided at the perimeter and throughout the interior of the parking lot. Interior planting in parking areas enhances the area and provides many functional advantages. Planting in parking areas adds scale, helps visually reduce the size of parking lots, and establishes a visual relationship with the buildings they serve. The following are guidelines to parking area landscapes:

- When funding is limited, placing a few large planting islands having sizable plant material in strategic locations will have greater visual impact than using smaller caliper trees in numerous planting islands.
- Planting islands shall be a minimum of 8' wide to provide adequate space for trees and adequate clearance for car overhangs or for opening car doors.
- Trees shall be a minimum of 2" to 2-1/2" in caliper at the time of planting.



- The maximum height of screening at the parking lot perimeter shall be 3′.
- Curbs shall be provided around all planting islands in paved parking areas.
- A ratio of one shade tree per three parking spaces is recommended.
- Maintain safe sightlines at the entrances to parking areas. These sightlines shall not be blocked by signs, fences, walls, obstacles or landscape material.
- Parking shall be located 10′-15′ (minimum) from the face of a building.
- A clear area of 2′ should be provided for car overhangs into adjoining planting beds and for placement of signs that designate reserved parking spaces.

Temporary and Overflow Parking

- There should be areas identified for temporary and overflow parking. During limited periods of time, additional parking space may be required to provide for a special event.
- Pervious materials such as crushed stone or compacted sand shall be used for temporary and overflow parking. Asphalt surfaces are not permitted for this type of parking.

Service and Loading Areas

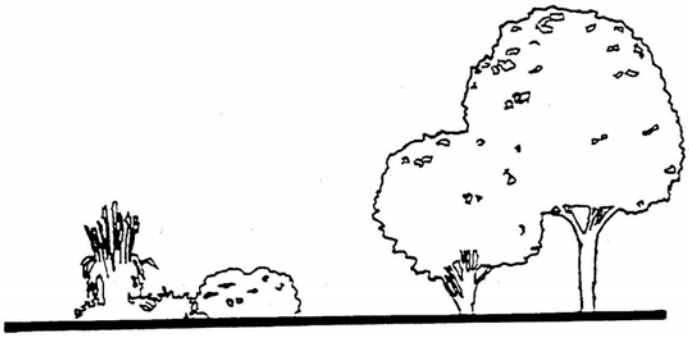
- Service and loading areas shall be located at the rear or to the side of a building to minimize adverse visual impacts. Proper screening, through landscaping and/or fences, is required for highly visible loading areas.

nH 12-176

III.2-4 PLANTING

General Information

This subsection will convey basic information concerning design concepts and guidelines that can be incorporated at Picatinny Arsenal to enhance the quality of the landscape. The ease of maintenance should be one of the primary goals when considering the success of any planting design. Seasonal interest should be another goal that is accomplished through the use of deciduous and evergreen trees. Landscape plantings provide a simple and cost effective enhancement to the general appearance of the installation. They add an element of human scale to open spaces. Plantings can also be used functionally to screen undesirable views, buffer winds, or provide a visual transition between dissimilar land uses.



Picatinny Arsenal already conveys a natural wooded image in its overall appearance. The use of native plant materials should be continued whenever possible. Native plants require less maintenance and irrigation and will blend in with existing wooded areas, thus creating a more consistent planting scheme within the surroundings. Native plant materials are also recommended in the more rural settings found throughout the installation. However, non-native (but acclimated) species can be introduced in densely developed areas.

Picatinny Arsenal falls within Zone 6 of the United States Department of Agriculture *Plant Hardiness Map*. Included in this subsection is a chart of recommended plant species appropriate for this zone. Additional plant lists have also been provided for special situations such as recommended street trees and parking lot plantings. These lists serve as references only. An analysis of microclimate and other site constraints and design goals must be considered prior to the selection of suitable plant material for a specific area.

ATI3-127

Proposed plantings must be analyzed to ensure that site conditions (soil, topography, adjacent uses and architecture) and climatic criteria (sun, shade and moisture requirements) are considered in the desired plant design and selection (i.e., form, texture, color, size). The uses and users of the site must also be considered. For example, in high child-use areas poisonous and thorny plants as well as fruit-producing plants should be avoided. Landscape planting plans should be approved by qualified personnel at Picatinny Arsenal to provide quality assurance and promote design consistency within each visual zone.

Plant List

BOTANICAL NAME/ COMMON NAME	FUNCTIONS	MATURE DISTINGUISHING FEATURES	HEIGHT/ WIDTH	SPACING	EXPOSURE
Major Deciduous Trees					
Acer platanoides/ Norway Maple & "Crimson King"	Dense shade tree	Fall color	70′/50′	25-30′	Sun - partial shade
Acer rubrum/ Red Maple	Shade tree, Spring-dug only	Fall color	70′/50′	25′	
Acer saccharum/ Sugar Maple	Large shade tree, specimen, massing, lawn, wildlife beneficial, does not tolerate air pollution or paved areas very well	Fall color	75′/50′	30′	Sun - partial shade
Fagus grandifolia/ American Beech	Large specimen, grove; lawn; use in large areas, shallow root system limits use along streets and walks	Fall color, bark	70′/60′	30′	Sun - partial shade
Fraxinus pennsylvanica/ "Marshall's Seedless"	Street tree, shade tree, salt tolerant	Fall color, rapid growth	60′ / 50′	25-40′	Full sun
Ginkgo bilboa/ Ginkgo or Maidenhair Tree (male form only)	Large shade tree, specimen, salt tolerant	Fall color, leaf form	75′/40′+	30-40′	Full sun
Gleditsia triacanthos, var. inermis "Shademaster"/ Shademaster Honeylocust	Light shade, canopy, filtered shade	Filtered shade, rapid growth	60′/50′	25-30′	Full sun
Metasequoia glyptostroboides/Dawn Redwood	Large tree, parks, massing	Bark, rapid growth	70-100′/25′	30′	Full sun
Quercus rubra/ Northern Red Oak	Street tree, shade tree, wildlife beneficial	Fall color	70′/45′	25-40′	Full sun
Quercus palustris/ Pin Oak	Lawn tree, wildlife beneficial	Fall color, tree form	70′/40′	25-30′	Full sun
Quercus phellos/ Willow Oak	Street tree, shade tree	Fall color	60′/40′	35-40′	Full sun
Tilia cordata/ Littleleaf Linden	Street tree, lawn	Fragrant flowers	70′/45′	25-40′	Full sun
Zelkova serrata "Village Green"/ Village Green Japanese Zelkova	Street tree, lawn	Fall color	70′/50′	30-40′	Full sun

AA 13-129

BOTANICAL NAME/ COMMON NAME	FUNCTIONS	MATURE DISTINGUISHING FEATURES	HEIGHT/ WIDTH	SPACING	EXPOSURE
Minor Deciduous and Flowering Trees					
Acer ginala/ Amur Maple	Specimen/screening ornamental	Fall color, fruit	20'/20'	10-15'	Sun - partial shade
Aesculus x carnea/ Red Horsechestnut	Specimen	Flowers	50'/30'	25-30'	Sun - partial shade
Amelanchier canadensis/Shadblow	Screen, massing	Flowers	30'/25'	20-25'	
Betula papyrifera/ Paper or Canoe Birch	In a naturalistic setting, grove, specimen	Fall color, bark	70'/45'	25-30'	Full sun
Carpinus betulus/ European Hornbeam	Street tree, lawn tree	Bark	45'/25'	30-40'	Sun - partial shade
Carpinus caroliniana/ American Hornbeam	In a naturalistic bark, fall color setting, screening	Slow growth,	30'/30'	30'	Partial - heavy shade
Crataegus x lavellei/ Lavalle Hawthorn	Wildlife beneficial	Fall color, fruit, flowers	30'/25'	10-20'	Full sun
Crataegus oxyacantha "Crimson Cloud"/ Crimson Cloud Hawthorn	Massing, wildlife beneficial	Flowers, fruit, fall color	20'/20'	10-20'	Full sun
Crataegus phaenopyrum/Washington Hawthorn	Massing, specimen, screen, wildlife beneficial; limit use in pedestrian areas due to thorns	Fall color, fruit, flowers	30'/25'	10-20'	Full sun
Crataegus toba/ Toba Hawthorn	Specimen, massing, wildlife beneficial, almost thornless	Fall color, flowers, twisted trunk	20'/18'	10-20'	Full sun
Elaeagnus angustifolia Russian Olive	Massing, limit use in pedestrian areas due to thorns, salt tolerant	Salt tolerant, grayish foliage	20'/20'	15-20'	Full sun
Malus baccata/Siberian Crabapple	Massing, wildlife beneficial	Flowers, fragrance	50'/30'	15-25'	Full sun
Malus floribunda/ Japanese Flowering Crabapple	Massing	Flowers, fragrance	25'/25'	20'	Full sun
Malus "Katherine"/ Katherine Crabapple	Massing	Flowers	20'/20'	20'	Full sun
Malus zumi calocarpa Zumi Crabapple	Massing	Flowers	15'/15'	20'	Full sun

ATT 12-13D

BOTANICAL NAME/ COMMON NAME	FUNCTIONS	MATURE DISTINGUISHING FEATURES	HEIGHT/ WIDTH	SPACING	EXPOSURE
***Minor Deciduous and Flowering Trees** (cont.)*					
Pyrus calleryana "Bradford" / Bradford Callery Pear	Street tree	Flowers, fall color	50'/35'	30-40'	Full sun
Phellodendron amurense / Amur Corktree	Specimen, large open areas, shallow root system limits use along streets and walks	Bark, light shade tree	45'/45'	30'	Full sun
Rhamnus frangula "columnaris" / Tallhedge Buckthorn	Hedge, screening, windbreaks	Columnar form	15'/5-10'	15'	Sun - partial shade
Sorbus aucuparia / European Mountain Ash	Small specimen, accent, wildlife beneficial	Fruit	40'/25'	25'	Full sun
Major and Minor Evergreen Trees					
Juniperus virginiana / Eastern Red Cedar	Screening, informal hedge	Bark, pyramidal	50'/20'	8-10'	Sun
Picea abies / Norway Spruce	Screen, specimen windbreak	Pyramidal	60'/30'	30-40'	Partial shade
Picea omorika / Serbian Spruce	Screening	Narrow pyramidal	60'/25'	20-25'	Partial shade
Picea glauca / White Spruce	Windbreak, screening	Pyramidal	60'/20'	8-10'	Full sun - partial shade
Pinus Strobus / Eastern White Pine	Massing, screening	Pyramidal, rapid growth	80'/40'	15-30'	Sun - partial shade
Thuja occidentalis "Nigra" / Dark American Arborvitae	Hedge	Pyramidal	20'/15'	3-5'	Full sun
Tsuga canadensis / Canadian Hemlock	Massing, screening, may be trained to hedge	Pyramidal, graceful	70'/35'	12-20'	Sun - shade
Evergreen Shrubs					
Ilex crenata "Helleri" Helleri Holly	Hedge, foundation planting, massing	Slow growth, fine texture	4'/5'	18"-2' O.C.	Sun - shade
Juniperus chinensis Hetzii "Galuca" / Hetz Blue Juniper	Banks, low wind-screen, barrier, highway	Rapid growth	6'/3-4'	2-4' O.C.	Full sun
Juniperus chinensis Pfitzeriana "Compacta" / Compact Pfitzer Juniper	Large scale hillside barrier	Compact, low growing	18"/6'	2-3' O.C.	Full sun

BOTANICAL NAME/ COMMON NAME	FUNCTIONS	MATURE DISTINGUISHING FEATURES	HEIGHT/ WIDTH	SPACING	EXPOSURE
Evergreen Shrubs *(cont.)*					
Juniperus chinensis, var. sargenti/ Sargents Juniper	Massing, near buildings and plazas	Low growing	18"-2'/9'	3-4' O.C.	Full sun
Juniperus horizontalis "Bar Harbor"/ Bar Harbor Juniper	Ground cover, near buildings and plazas	Grey-purple winter color	1'/7'	24-30" O.C.	Full sun
Pieris japonica/ Andromeda or Japanese Pieris	Mass or specimen, protect from wind & winter sun	Dark green foliage/bronze new growth	9-12'/6-8'	3-5' O.C.	Full sun - partial shade
Pinus mugo var. mugo/ Mugo Pine	Accent	Slow growth	8'/16'	3-5' O.C.	Sun - partial shade
Rhododendron catawbiense/Catawba Rhododendron	Near buildings and plazas in groups (protected)	Slow growth, flower, foliage	8'/7'	3-4' O.C.	Partial shade
Rhododendron "P.J.M."/PJM Rhododendron	Near buildings and plazas (protected)	Flower, foliage	6'/6'	2-3' O.C.	Partial shade
Deciduous Shrubs					
Clethra alnifolia/ Summersweet Clethra	Good in wet and shady areas, massing, naturalistic understory	Fragrant flower, foliage	3-8'/4-6'	2-3'	Full sun - shade
Comptonia peregrina/ Sweetfern	Roadway mass and bank plantings, naturalistic planting	Fragrant	2-4'/4-8'	2-4'	Full sun - partial shade
Cornus alba "sibirica"/ Siberian Dogwood	Mass, roadside and naturalistic plantings, wet conditions	Red stems, flower	8-10'/5'	2-3'	Sun - partial shade
Euonymus alatus/ Winged Euonymus	Massing, highway, banks	Winged stems, slow growth, fall color	15-20'/ 15 - 20'	3-5'	Full sun - heavy shade
Euonymus alatus "compactus"/ Dwarf Winged Euonymus	Hedge, specimen, good near buildings	Fall color, corky bark	10'/10'	3-5'	Full sun - heavy shade
Ligustrum amurense/ Amur Privet	Hedge (requires pruning)	Fast growth	12-15'/ 8 - 10'	3-5'	Full sun - partial shade
Lonicera tatarica "alba"/Tatarian Honeysuckle	Massing, informal hedge, roadside	Fragrant flowers	9-10'/10'	3-5'	Full sun - partial shade
Myrica pennsylvanica/ Northern Bayberry	Massing, roadsides, naturalistic plantings near buildings and plazas	Fragrant fruit	9'/9-12'	2-3'	Full sun - partial shade
Potentilla fruiticosa/ Bush Cinquefoil	Low mass, color accent	Flower	1-4'/2-4'	1-2'	Full sun - partial shade

A#13-132

BOTANICAL NAME/ COMMON NAME	FUNCTIONS	MATURE DISTINGUISHING FEATURES	HEIGHT/ WIDTH	SPACING	EXPOSURE
***Deciduous Shrubs** (cont.)*					
Prunus cistena/ Purpleleaf Sandcherry	Massing, color	Summer color	6-8′/6′	3-5′	Full sun - partial shade
Rhus aromatica/ Fragrant Sumac	Foreground massing on banks and road-sides, sprawling shrub	Fall color, fast-spreading, fragrant	2-6′/6-10′	3-5′	Full sun - partial shade
Rhus typhina/ Staghorn Sumac	Massing, roadsides, shrub or small tree	Fall color, fruit, habit	15-30′/15-30′	8-10′	Full sun - partial shade
Rosa rugosa/ Rugosa Rose	Massing for banks or difficult sites	Fragrant flowers, fruit	4-6′/4-6′	2-3′	Full sun
Symphoricarpos albus/ Common Snowberry	Massing	Fruit	3-6′/3-6′	1-3′	Full sun - partial shade
Symphoricarpos orbiculatus/Indiancurrant Coralberry	Massing, banks	Fruit, fall color	2-5′/4-8′	2-3′	Full sun - partial shade
Syringa villosa/ Late Lilac	Shrub border, use in residential and pedestrian areas	Flower	6-10′/4-10′	2-5′	Full sun
Syringa vulgaris/ Common Purple Lilac	Shrub border, use in residential and pedestrian areas	Fragrant flowers	8-15′/6-12′	3-6′	Full sun
Vaccinium corymbosum/ Highbush blueberry	Residential and pedestrian spaces, naturalistic planting	Fall color, fruit, flower	6-12′/8-12′	3-4′	Full sun - partial shade
Viburnum acerifolium/ Mapleleaf Viburnum	Massing, woodland planting	Fall color	4-6′/3-4′	1-2′	Shade - heavy shade
Viburnum x burkwoodii/Burkwood Viburnum	Massing, woodland planting	Fall color, fragrant flowers	8-10′/5-6′	3-4′	Partial shade
Virburnum cassinoides/Witherod Viburnum	Mass woodland planting, could use in residential and pedestrian spaces	Fall color, fruit	5-6′/5-6′	1-2′	Shade
Viburnum dentatum/ Arrowwood Viburnum	Massing, informal hedge	Fall color, fruit	6-15′/6-15′	3-6′	Sun - partial shade
Viburnum lentago/ Nannyberry Viburnum	Background screen, use at woodland edge, good for birds	Flowers, fruit	15-30′/10′	3-8′	Sun - shade
Viburnum plicatum var. tomentosum/ Doublefile Viburnume	Massing, screening	Foliage, fall color, flowers	8-10′/9-12′	4-5′	Sun - shade
Viburnum prunifolium/Blackhaw Viburnum	Massing, small specimen tree, wildlife beneficial	Fall color	12-15′/8-12′	4-6′	Sun - shade
Viburnum sieboldii/ Siebold Viburnum	Specimen, small groups	Flowers, fruit, foliage	15-20′/10-15′	5-6′	Partial shade

AA13-133

BOTANICAL NAME/ COMMON NAME	FUNCTIONS	MATURE DISTINGUISHING FEATURES	HEIGHT/ WIDTH	SPACING	EXPOSURE
Groundcovers					
Juniperus horizontalis "Bar Harbor"/ Bar Harbor Juniper	Large area groundcover, banks	Evergreen, silvery purple foliage in winter	1'/6-8'	18" O.C.	Full sun
Juniperus horizontalis Wiltoni/ Blue Rug Juniper	Large area groundcover, banks	Trailing habit, evergreen	4-6"/6-8'	18" O.C.	Full sun
Juniperus Chinensis, var. sargentii / Sargents Juniper	Large area groundcover, banks	Evergreen	18"-2'/8-9'	18" O.C.	Full sun
Parthenocissus quinquefolia/ Virginia Creeper	Large area groundcover, wall climber	Fall color deciduous, rapid growth, can climb	4-6"/climber	3-5'	Full sun - full shade
Vaccinium angustifolium/Lowbush Blueberry	Naturalistic area, shade, can be used in small spaces	Fall color, flower, fruit	6"-2'/2'	12" O.C.	Full sun - partial shade
Vinca minor/ Common Periwinkle	Small scale, use in residential and pedestrian areas	Evergreen, foliage, flowers	3-6"/1'	12" O.C.	Partial shade

Street Trees

Street trees can help establish and define the hierarchy of streets within Picatinny Arsenal. There are specific streets that are primary collectors which traverse the installation. Farley Avenue, a major roadway running east and west, is announced as an important street through the use of street tree plantings which convey a formal approach into the downtown and residential areas. Another street which traverses the installation between Main Gate and Navy Hill Gate is Parker Road. This roadway varies visually as a result of the existing wooded edge and development which continuously change through various visual zones. It is, however, one continuous road that traverses the installation between two primary gates. Street tree plantings can help provide a more consistent image along this thoroughfare.

Physical characteristics of a particular tree species should be considered prior to selection of a street tree. The mature height, spread, texture and shape of a tree should be considered, as well as the type of street on which it will ultimately be located. Physical site constraints, such as overhead utility lines, underground utilities and street lights, will require adequate clearance from street tree plantings. Street trees should be placed 15' from overhead utility lines. As a general rule, street trees should be deciduous species, resistant to salt and root pressure, and should have a 10'- to 12'-high clearance between the street pavement and branch

height to provide adequate truck clearance. It is recommended that these trees be a minimum of 3" caliper at the time of planting. A 10'- to 12'-wide planting strip is preferable in suburban and rural areas to ensure adequate room for the growth of the root system. When a detached walkway is preferred, the minimum allowance of 4' for a planting strip between the back of the curb and sidewalk is recommended with the trees centered within the planting area. Continuous planting strips are not recommended for urban areas.

It is recommended that street trees be spaced no greater than 35 feet on-center. The street tree layout should be coordinated with the layout of proposed street lighting. Closer tree spacing can be used in special areas such as open spaces or pedestrian activity areas to enhance and emphasize a particular area. Appropriate plant heights should be used within sight triangles to ensure safe views from intersections.

Recommended Street Trees

TREES FOR PRIMARY ROADS

Fraxinus pennsylvatica "Marshall's Seedless"	Marshall's SeedlessAsh
Gleditsea triacanthos var. inermis "Shademaster"	Shademaster Honeylocust (thornless)
Ginkgo biloba (male form only)	Maidenhair
Quercus phellos	Willow Oak
Zelkova serrata "Village Green"	Village Green Zelkova

TREES FOR SECONDARY ROADS

Acer rubrum "October Glory"	October Glory Red Maple
Quercus phellos	Willow Oak
Tilia cordata	Littleleaf Linden

TREES FOR TERTIARY ROADS

Carpinus betulus	European Hornbeam
Pyrus calleryana "Aristocrat"	Aristocrat Flowering Pear

Note: Physical site constraints should be considered in addition to the type of road on which the street tree will be located. For example, overhead utility lines along a primary road may warrant the use of a tree species with a shorter mature tree height.

Entrances to the Installation

The entrances and streetscapes into the installation are areas to place landscaping that will develop a strong visual image and provide visual interest during all four seasons. The entrance to the installation creates the first visual impression of Picatinny Arsenal for the visitor. At Picatinny Arsenal, guardhouses demark four of

the five entries to the installation. Although they are not always staffed with a guard on duty, the visitor will have a tendency to slow while passing the guard station. These areas are potential locations for planting islands which could provide seasonal interest. They are also locations for identification and directional signage. As an example, the visitors' center at Parker Road is conveniently located adjacent to the guardhouse and provides an opportunity to expand a cohesive planting scheme that would portray a positive visual image to the visitor.

The landscape materials and planting areas should be proportional in scale to the hierarchy of street on which they are located. Low shrubs, groundcover, annual/perennial plants and canopy trees provide seasonal interest as well as maintain views required to ensure security. Large evergreen plants are discouraged in these locations in that they obstruct sightlines and impact the need for safety and security.

Parking Lot Planting

Parking areas can be visual opportunities or liabilities to any developed area. These spaces should be considered as part of the entry approach to any building. Interior planting in parking areas enhances the space by adding the element of human scale and by helping to establish a visual relationship with the buildings they serve.

Interior landscaping must be provided in parking areas. Optimally, a 60-percent coverage is desired from fully matured trees. Tree numbers and locations in each lot shall be planned to achieve this ratio. Landscape plantings in parking areas serve to provide the following benefits:

- Reduce glare.
- Interrupt the sea of pavement used for parking.
- Provide shade to lessen the heat generated from massive paved areas.
- Provide a visual transition between the flat paved area adjoining the vertical wall of a building.
- Provide visual backdrops for tall light fixtures.

When funding is limited, placing a few large planting islands having sizeable plant material in strategic locations will result in more positive image than using smaller caliper trees in numerous planting islands. Vegetation also has a better chance of surviving in larger landscaped planting islands than as an individual tree in a narrow planting island.

ATT 13 · 136

Perimeter buffers should be provided around parking areas to help screen the obtrusive views of parked cars from the street. Solutions such as hedges, walls and informal plantings can effectively screen parked cars. Hedges do not necessarily have to be evergreen to be used for screening. A deciduous hedge can provide the same amount of screening in the winter with its branching habits and proper spacing as an evergreen hedge. Shrub and landscape plantings will also aid in the delineation of parking lot edges during periods of snow cover. Breaks in these hedges at pedestrian circulation paths are recommended.

Tree Selection

Consideration should be given to the selection of appropriate tree species for parking areas. Trees with shallow root systems, and those which produce fruit, sap or have thorns should be avoided. A planting plan which uses three to five tree species is also less likely to produce a monoculture which could result in the loss of all the trees if they are susceptible to a pest or disease. A variety of tree species also provides a variety of colors, textures, and heights.

SHADE TREES

Acer rubrum	Red Maple
Fraxinus pennsylvatica "Marshall's Seedless"	Marshall's Seedless Ash
Ginkgo biloba (male form only)	Maidenhair
Gleditsia triacanthos "inermis"	Thornless Honeylocust
Quercus palustris	Pin Oak
Tilia cordata	Littleleaf Linden

ORNAMENTAL TREES

Prunus serrulata "Kwanzan"	Kwanzan Cherry
Prunus yedoensis	Yoshino Cherry
Pyrus calleryana "Aristocrat"	Aristocrat Flowering Pear

EVERGREEN TREES - FOR LARGE SCALE SCREEN

Pinus strobus	White Pine

DECIDUOUS SHRUBS

Berberis thunbergii	Japanese Barberry
Viburnum x burkwoodii	Burkwood Viburnum

EVERGREEN SHRUB

Juniperus (species)	Junipers
Ilex cornuta "Rotunda"	Compact Chinese Holly
Prunus laurocerasus "Otto Luyken"	Otto Luyken Cherry Laurel
Ilex crenata "Helleri"	Dwarf Japanese Holly

Foundation Planting

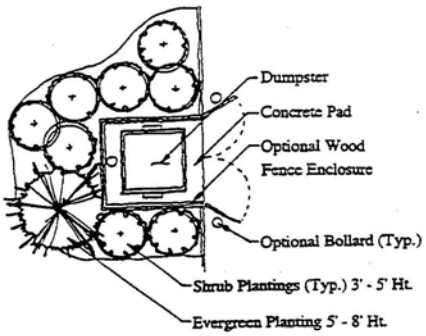
The following are benefits and recommendations for foundation planting.

- Landscape plantings can be used to reinforce and direct pedestrians to main building entrances.
- Landscape plantings can be used to reinforce architectural symmetry.
- Landscape plantings can visually break up massive building elevations.
- Landscape plantings can be used to define building frontality.
- Landscape plantings can help visually terminate view areas.
- Landscape plantings create a sense of arrival.
- Focal and seasonal plantings should be located at building entries for pedestrian interest. Building entries provide opportunities for a high level of detail in the design, layout and choice of materials, since these areas often become used for people gathering. Seating, special paving, textures and seasonal plantings should be incorporated at these locations. Care should be taken to locate site furnishings appropriately.
- The architecture of the building should also be used to evaluate the planting design and selection of plants. Planting design and layout should respond to the building architecture. Plant material should not block windows and views from important interior spaces. Trees shall be setback from the building walls to provide space for mature growth and to prevent root systems from damaging the foundation. Plant material should accent the building and not obstruct important features of the building architecture (e.g., a white flowering tree should not be selected to accent a white building unless evergreens are used as a backdrop). A symmetrical foundation planting design should be used for a symmetrical building.

Screening

SCREENING OF DUMPSTERS

- Dumpsters must be sited out of primary viewsheds to minimize negative visual impacts.
- Dumpsters must be located adjacent to service areas and loading docks.
- Landscape plantings should be used to supplement wood fence and masonry wall dumpster enclosures.



AII13-138

SCREENING OF UTILITIES

- A bed of stone should surround all mechanical units.
- Adequate clearance should be maintained around units for air circulation and maintenance access.
- Mechanical units should be located away from entrances and areas of high visibility.

Native Tree Plantings

The use of existing tree species enhances the image of a proposed development as well as helps maintain the project's woodlands image. A tree survey should be compiled to inventory the location, species, size and condition of existing trees prior to site planning. The use of native plant material also helps the project blend with its surroundings.

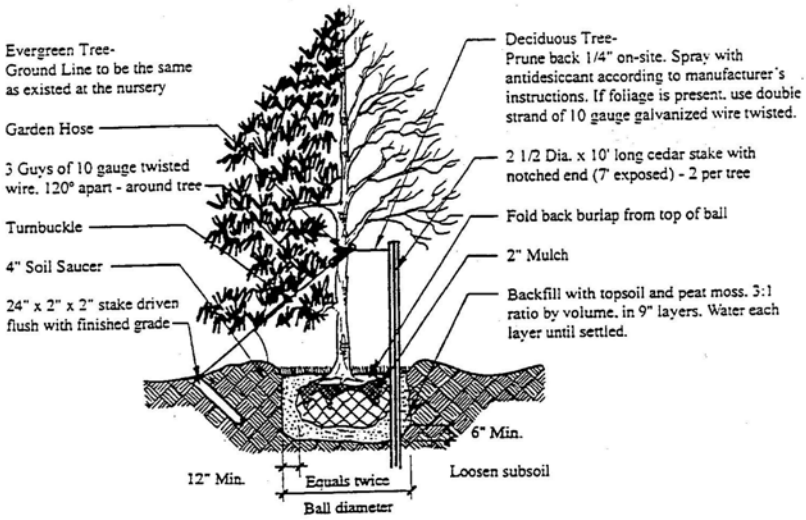
Tree preservation techniques are important considerations when there is a desire to save existing trees. Care should be taken to protect the root system from compaction caused by construction equipment and the placement of fill and debris over the root zone.

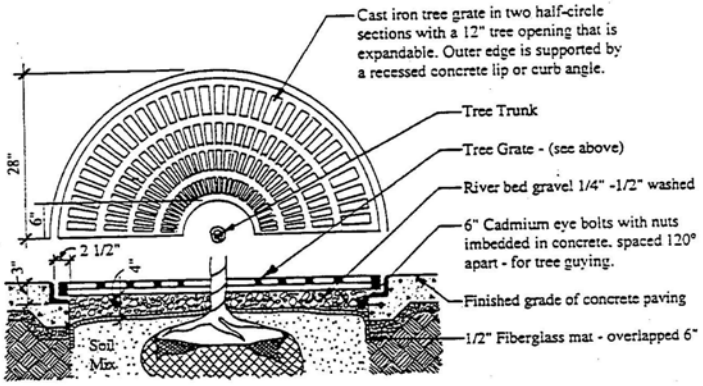
Installation of Planted Material

Shrubs can be divided into three categories according to their mature height.

	Mature Height	*Recommended Spacing*	*Spacing from Structure*
Small Shrubs	3 to 5 feet	2′ to 3′ apart	3′ Min.
Medium Shrubs	5 to 8 feet	3′ to 3-1/2′ apart	3-1/2′ Min.
Large Shrubs	8 to 15 feet	4′ to 6′ apart	5′ Min.

Note: This chart should be used as a recommended guide only. Specific growth and form characteristics should be considered for the plant species. All installation practices should follow *U.S. Standards for Nurserymen* (*latest edition*).





Simple planting concepts are recommended such as massing of individual shrubs into groups and the use of large planting beds. The use of these techniques will result in an aesthetic solution to installation landscape requirements.

Maintenance

The following recommendations will reduce maintenance as well as accommodate routine maintenance practices.

- Leaf litter is a factor to consider in the maintenance of parking areas. The selection of deciduous trees with smaller leaves which will scatter easily is preferable to deciduous trees whose leaf litter is composed of larger leaves which are harder to remove.

WTT 13-140

- Designated grassy areas should be provided as collection areas for snow removal.
- Planting areas adjacent to paved areas should be large enough to accommodate the tree plantings. This will reduce the maintenance to paved areas which may buckle from the interference of root systems as the tree matures.
- In areas where grass will be used, provide large mowing strips for ease in maintenance.
- Although mulch is initially expensive, it reduces maintenance, retains soil moisture and provides a more natural looking ground cover than the use of stone. Mulch also provides
humus to the soil as it decomposes.

PRUNING SHRUBS

- Do not prune shrubs into individual globes.
- Do not prune shrubs flat across the top.
- Prune a plant wider at the bottom than at the top to encourage branching.
- Prune branches yearly on thick-branched shrubs and at the base of the shrub.
- Prune needled evergreens where new growth is evident.

PRUNING TREES

- The natural shape of a tree should be maintained when pruning the height and width of a tree.
- Remove a large limb by making three cuts as follows:
  - Make the first cut on the bottom of the branch 12-24" from the branch attachment.
  - Make the second cut on the top of the branch within 1" of the undercut.
  - Make the final cut just beyond the outer portion of the branch collar. The first two cuts were necessary to re move the weight of the branch and allow cut #3 to be clean without ripping the bark.
- A dead branch stub that has a collar of live wood should be cut just at the outer edge of the collar. The cut will heal itself to prevent decay and insects from entering the interior wood. Wood sprays may be used for aesthetic reasons if desired.

III.2-5 SIGNAGE

General Information

The goal of signage is to effectively communicate information. An effective and unified signage system portrays an image of visual consistency throughout the installation as well as establishes a community character. A sense of order and attention to detail is depicted which results in positive first impressions. It is important to adhere to standard signage guidelines in order to reinforce a consistent image.

Picatinny Arsenal is presently in the process of standardizing signage used throughout the installation. Street signs have been located at street intersections, and building identification signs have been installed at each building. Buildings have also been numbered which helps avoid confusion in locating a destination.

- All proposed sign installation, replacement and maintenance should be coordinated with the DEH at Picatinny Arsenal to ensure standardized colors, symbols, materials, typeface and placement are used.
- Traffic signage shall conform to Department of Transportation (DOT) Standards. Refer to the *Manual on Uniform Traffic Control Devices*, published by the U.S. Department of Transportation/Federal Highway Administration, for standard traffic signs and symbols.
- Refer to *TM 5-807-10* for signage guidelines, specifications and sample layouts.

Sign Types

ENTRY SIGNS

Entrance signage announces the identity of the installation and is typically found at the perimeter entrances to the installation.

- A consistent image and location relative to the entrance should be used at each installation entrance whenever possible.
- Entrance signage located along major highways or roads should be illuminated with aesthetic lighting techniques such as accent lighting from indirect or below-grade weatherproof light sources.

BTF13 - 142

DIRECTIONAL SIGNS

Directional signs should be placed at important intersections or along primary streets to orient visitors to their destinations.

- A maximum number of six destinations should be listed per sign for clarity to vehicular traffic.
- Only one directional sign per entry route is permitted.

STREET SIGNS

Street signs shall be provided at each street intersection.

- A total of two street signs should be provided at each intersection.
- Sign locations shall not interfere with sight lines within the sight triangle.
- Signage should not be obstructed with vegetation or other objects.

BUILDING IDENTIFICATION SIGNS AND NUMBERS

This sign type identifies individual buildings and their occupants. These signs are freestanding and can be incorporated into planting beds. A building number should be placed on each building. These numbers shall be positioned in a consistent location on each building throughout the installation or within each visual zone or thematic area.

- Building signage shall be used at each building to identify the occupant.
- Building signs should be located near the entrance of the building and be clearly visible to pedestrians and traffic.
- Consistent signage placement and setbacks should be used whenever possible.

PROHIBITORY AND WARNING SIGNS

Prohibitory and warning signs are used in restricted areas to warn users of danger or specific procedures and to convey safety information.

- Standardized colors, typeface, layout and shapes should be used to provide users with signs that are easy to recognize.

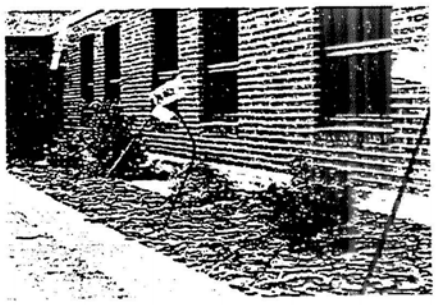
MOTIVATIONAL SIGNS

Motivational signs promote annual or special events to installation personnel. This type of sign is placed in a limited number of locations such as public nodes or important intersections. They are often colorful and create a positive image to installation personnel.

RESERVED PARKING SIGNS

Reserved parking signs indicate specific parking spaces for designated personnel.

- This sign type should be limited in a parking area. It should not occupy more than 20 percent of the spaces in a designated parking area.
- Reserved parking signs should be located properly behind the curb or wheelstop to prevent damage which may be caused from car overhangs.
- Stenciling the sign text on curbs and pavement is prohibited.
- Reserved parking signs shall not be used for on-street parking spaces.

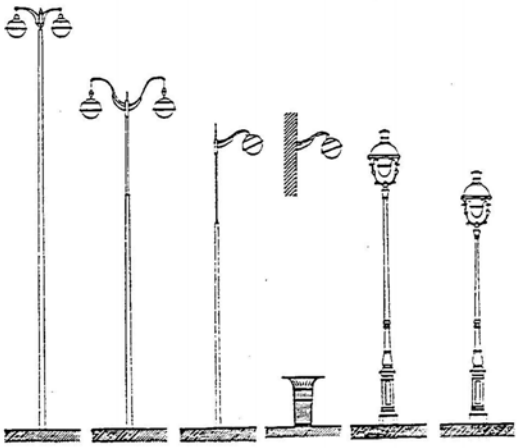


AH 13-144

III.2-6 LIGHTING AND UTILITIES

General Information

Lighting and utilities are elements that provide necessary services to the installation. They must also be considered as important elements of the visual environment. It is essential to establish design criteria for lighting and utilities to ensure that they will not detract from the visual environment. These elements can be unobtrusive and even accent specific areas if they are used appropriately.



- Light and utility fixtures should either be unobtrusive or decorative elements in the visual landscape.
- A system of light fixtures should be established for the installation that will provide a coordination of styles, types and sizes.

Lighting

There are numerous types of lighting available. Each light type has different characteristics which should be considered prior to selection.

HIGH PRESSURE SODIUM

- Produces a pink to orange light color.
- Very efficient.
- Relatively long lamp life.

LOW PRESSURE SODIUM

- Produces a monochromatic yellow light color.
- Highest efficiency rating.
- Long lamp life.

METAL HALIDE

- Good color rendition, highly recommended, especially in urban areas.
- Efficiency varies between ratings for mercury vapor (low) and high pressure sodium (high).
- Lamp life varies between ratings for mercury vapor (long) and high pressure sodium (moderate).

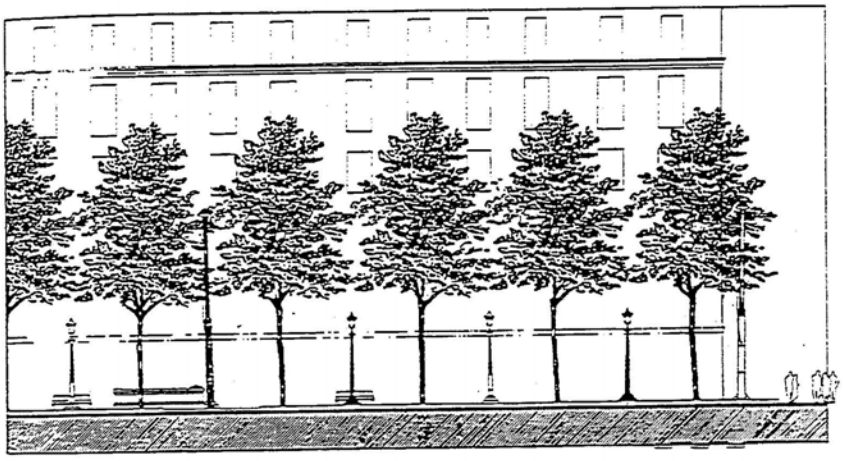
INCANDESCENT

- Lowest efficiency rating.
- Shortest lamp life.
- This type of light should only be used as an accent light in exterior situations (primarily residential).

AH 13-145

MERCURY VAPOR

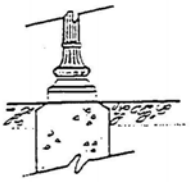
- Produces a blue to green light color.
- Not as efficient in comparison to high pressure sodium.
- Long lamp life.
- Produces low lighting levels.



Downtown example

Mounting Procedures

The location of a light fixture will affect its mounting procedure. In lawn and landscape areas, the fixture shall be mounted on a three-inch concrete base. In paved areas such as sidewalks and plazas, the fixture shall be mounted flush to the surface.



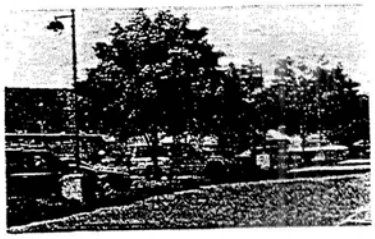
Hardsurface area

Softsurface area

Light Fixtures in Parking Areas - Light fixtures shall be located in landscape islands within the parking area and around the perimeter of the parking lot. All light fixtures shall be mounted on black aluminum poles which will blend in with the surrounding landscape.

Street Lights

Street light locations shall be coordinated with street tree planting locations. Light poles shall be placed a minimum of three feet behind the back of the curb and shall not interfere with pedestrian walks located along the road. Heights of light poles shall be proportional to the type of road which they will serve.

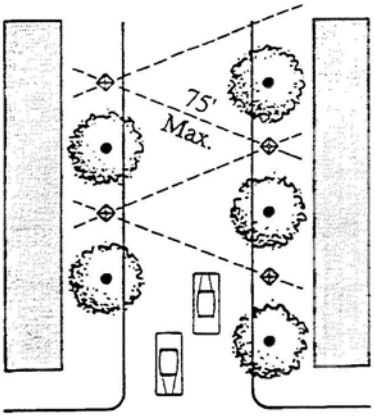


The height of a light fixture is dependent upon the type of roadway or area where it is to be used. The following list shows recommended guidelines for light fixture heights for

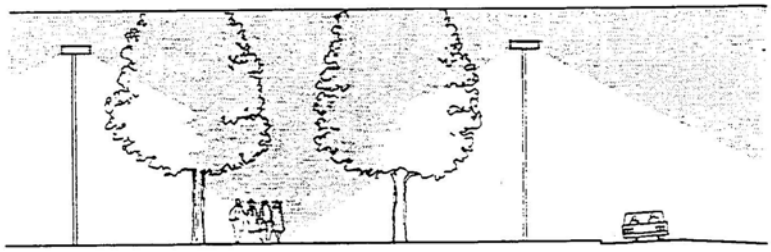
A 1113 - 146

different areas; however, the lighting layout will be determined by the light source as well as the manufacturer's specifications.

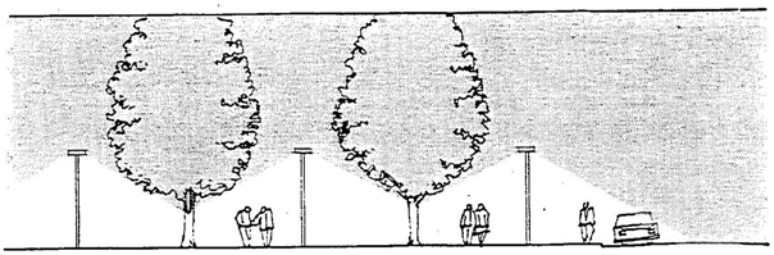
Type of Space	*Recommended Height*
Primary Road	30-35′ Ht.
Secondary Road	25-30′ Ht.
Tertiary Road	15-20′ Ht.
Parking Lot	15-30′ Ht.
Pedestrian Space	8-14′ Ht.



Street light spacing



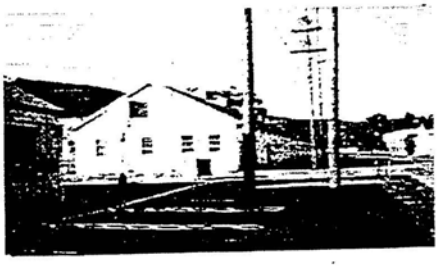
Lighting from high-mount fixtures may conflict with foliage, creating undesirable shadows

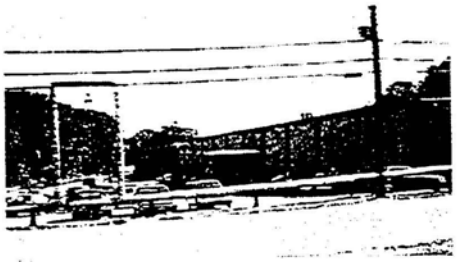


Low-mount fixtures provide for better lighting uniformity and vertical surface illumination

Utilities

- Transformers, meters and mechanical units shall be placed at the rear of buildings whenever possible. Efforts shall be made to make these structures unobtrusive in an attempt to eliminate visual clutter. Landscape plantings or walls may be used to screen these structures.
- Underground utilities should be considered to eliminate visual clutter in areas accessible to the public. A coordinated system of utility locations, such as central trenches on one side of the road, would also organize placement of these utilities.



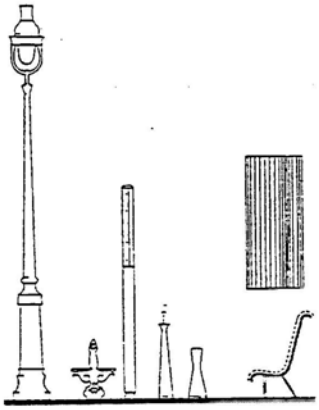


- Manholes that are located in plazas and walks throughout the installation (with the exception of The Tracts visual zone) shall consist of decorative grates and covers or of a special construction type which allows them to be paved with the same material as the adjoining area.
- All drainage inlets shall be located so they will not interfere with cross walks.
- Drainage inlet grates shall be aligned perpendicular to traffic flow to ensure the safety of bicycle users.

ATT 13 - 148

III.2-7 SITE FURNISHINGS

General Information



Site furnishings play an important role in establishing the visual environment of an installation. They can potentially provide a unifying element throughout an area. Site furnishings should be grouped at locations where people congregate (nodes). Two examples of typical pedestrian nodes include building entrances and bus stops. The following is a list of criteria which should be considered for location and type of site furnishings.

- Provide appropriate site furnishings which respond to human scale (i.e., proper bench heights and sizes for the comfort of the intended user).
- Incorporate adequate provisions for handicapped users (refer to *TM 5-803-5*).
- Establish a coordinated system of furnishing styles for the installation or within each visual zone.
- Ensure that the site furnishings chosen will meet the functional needs of the intended users.
- Group site furnishings together. This will reduce maintenance and provide an aesthetic visual image.
- Appropriate locations should be selected to ensure a positive visual image.

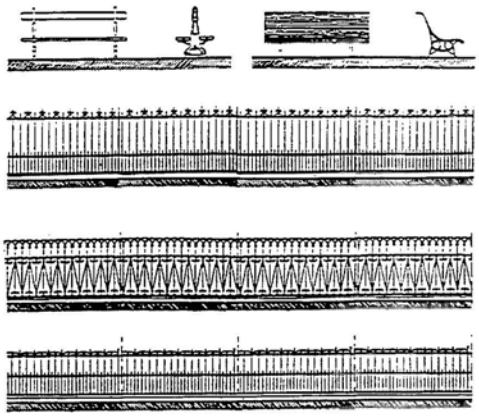
Benches

Benches provide a comfort amenity for users as well as visual detail. Placement of benches can indicate an important pedestrian node in an area. Seating areas are often sited at the periphery of activity areas which provide users with important vantage points. A higher level of detail, such as color and texture, should be provided in these areas in pavement and landscape material. Microclimate should also be considered. The use of deciduous trees will provide shade in the summer and sunny spaces during colder periods of the year. Cold winds should be buffered with evergreen plantings.

The following is a list of design criteria for benches:

- Adequate space shall be provided. Benches shall be set back from pedestrian circulation paths.
- Benches shall be placed on concrete or unit pavers.
- An additional 3′ of paved area shall be provided adjacent to benches to accommodate wheelchair access.
- Benches shall have wooden seats for comfort.
- A trash receptacle shall be provided in the vicinity of the seating area.

Fences and Walls



Fences and walls provide visual screens as well as physical barriers used for security. They can establish or enhance a visual theme in the landscape. The type of fence or wall used should complement and be compatible with the surrounding architecture. For example, a wrought iron fence or brick masonry wall would complement a brick masonry building found in the PM Row visual zone. In areas of high visibility, fences should be black and constructed of cast iron or aluminum. Masonry is the preferred material for walls.

Chain link fence used adjacent to road rights-of-way in high visibility areas shall be black vinyl-clad or perma-fused chain link fence. This treatment will result in a less visually obtrusive fence along road rights-of-way. In vegetated areas, this color will blend with the surrounding vegetation.

Masonry walls shall match the building exterior material of adjoining buildings. A sense of permanence is conveyed in important building zones when masonry walls are used.

Picnic Areas

A common type of open space used at Picatinny Arsenal is the picnic area. A primary recreational picnic area, located at Lake Denmark, can accommodate a relatively large number of people. A wooded setting, views across the lake, and other recreational amenities are also found in this area. A more recent addition, currently under construction, is a centralized picnic area that will serve the downtown area. However, a second type of picnic area used by personnel for lunch and work breaks consists of smaller areas at the sides and backs of buildings.

- Provide trash and ash receptacles in the general vicinity of the picnic area.
- Utilize deciduous plant materials which will create comfortable microclimates throughout the year and result in year-round use.
- Physically separate picnic areas from parking and vehicular circulation.

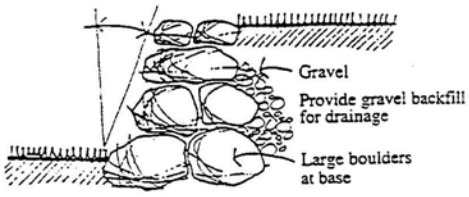
ATT 13 - 15h

Retaining Walls

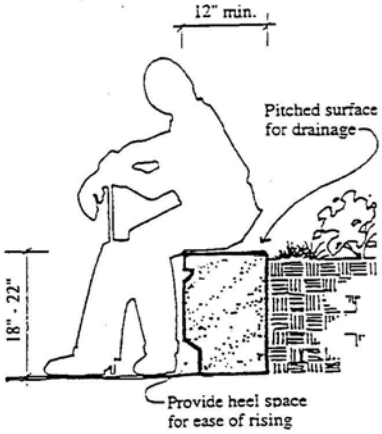
Retaining walls can be used as a functional as well as visual solution to areas with severe grade changes. A retaining wall may be a more appropriate long-term solution than leaving a severe slope which will be difficult to maintain.

Retaining walls must complement adjacent architecture in high visibility areas. Masonry retaining walls are preferable when adjoining brick buildings. The use of boulder retaining walls must also be considered since the materials are readily available on the installation and they complement the landscape in wooded settings and along road rights-of-way.

Soil conditions, drainage and structural conditions must be considered in the design of a retaining wall and may affect the ultimate material selection. The use of retaining walls as informal seating areas in pedestrian zones is a viable option. Proper heights to accommodate comfortable seating should also be used as a design criterion.



Retaining wall



Retaining wall/seating

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ATTACHMENT C

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Section 09B03

SAFETY SITE PLAN

FOR

200 AREA

MCA PROJECT # 49472

PICATINNY ARSENAL, NJ

Prepared by:
AMSTA-AR-WEA
~~September 2002~~
March 2003

SAFETY SITE PLAN

FOR

200 AREA

Introduction

This safety site plan pertains to the consolidation of the mission of the Energetic and Warheads Division into a single facility. This process is spread over 28 different old and decrepit buildings. A new building would be able to accommodate all the operations from all the old buildings at approximately 60 percent of the area currently occupied.

The new facility will include high bay areas, testing bays, storage areas, office area, and explosive storage magazines. The Facility will be enclosed with barricades on both sides. This facility will also include underground hot and cold-water recirculators, compressed air system, and vacuum pump system. Explosion proof lighting, conducting flooring, and lighting protection system will be provided.

Supporting facilities include all required utilities, paving, sidewalks, storm drainage, sanitary system, site improvements, parking area, and communication. Heat will be provided from a stand-alone boiler, which will provide steam service to this new building and other buildings (231, 236, 237 and 252) in the vicinity. Air conditioning and a ventilation system will also be provided.

Process Description

This process is required to support the only Army owned, Army operated facilities for energetic materials research, development, and interim qualification of new and improved energetic materials utilized in explosive munitions system (mines, armor, warhead, artillery, etc). This facility will have capability to develop new energetics from synthesis to scale up and loading to transition to the customer. The facility will also have press loading, experimental cast loading, precision machining and scale up of new high explosive formulations.

This process would provide EWD with an integrated and centralized facility for a substantial operating and maintenance cost savings. The operations include utilizing lathes, drill presses by remote control, to fabricate precision explosive shapes for use as samples or prototype test items. The high bays consist of different operations like Formulation, Oven Drying, Aging, Nitration Synthesis, Casting, Inspection and Assembly.

Building Description

A layout of building 200 area is shown in Figure 1-A.

The rear walls, roof and the dividing walls of the operating bays are to be reinforced concrete designed in accordance with TM5-1300, "Structures to Resist the effects of accidental explosions"(see Fig-2). The exterior wall of the building, facing the open ends of the bays, is constructed of a wooden framework with "blow-out" panels and faces directly onto the near vertical slope of the mountain. The interior bays are also to be constructed of 12 inch reinforced concrete for roof and walls except the walls facing mountain. The sidewalls and the roofs of Inert casting, Inspection and Assembly bays are to be constructed of 12-inch reinforced concrete. Also the wall separating the office area and the small bays is to be constructed of 12 inch reinforced concrete. See Figure 1-B.

EXPLOSIVE LIMITS

Referring to the plan layout in Figure 1A the explosive limits are shown for different bays. The bays have operation like mixing with explosive limit of max. 500 lbs, inspection, assembly, and inert casting with explosive limit of 50 lbs. The middle part of the building is used for operation like lathe, drill presses, milling and band saw with maximum explosive limit of 50 lbs. Other end of the building has operation like Nitration synthesis and casting with maximum explosive allowance of 250 lbs. The last two rooms are used for explosive storage magazine of 1000 lbs (1.1). All the bays are separated from each other by TM5- 1300 Blast walls.

PERSONNEL LIMITS

The total personnel limit for this facility is 25 people. This includes people working in the office.

Inhabited Building Distance (IBD) Requirements

Since the bays (3 walls cubicles with roof) are designed IAW TM5-1300 debris can escape only toward the mountain. Potential debris is assumed to be projected 60 degrees from either side of a normal along the axis of the bays as shown in Figure-3.

For storage magazine area Net Explosive Weight is 1000 lbs, using K-Factor (D=40W1/3) Inhabited Building Distance (IBD), comes out to be 400ft. The arc is shown in Figure –4. There are no inhabited buildings in that arc. With reference to B 252F which is potential for storage of explosive (Ref. To SSP dated June 1988), considering unbarricaded intraline distance using table from AMR 385-64 the distance is 180 ft. The arc shown in Figure 4 shows that B252F is well outside the arc.

The Public Transport Route (PTR) is 60% of 400ft =240ft.

IBD for potential debris i.e. towards the mountain is 1250 ft and PTR is 60% of 1250 = 750ft. The arcs are shown in Fig. 4.

For Inspection and Assembly area using explosive weight of 50 lbs; the IBD from table C2.T1 is 601 ft. The arc shown in fig 4 shows that there are no inhabited building within that arc. Building 271 areas are all demolished.

With reference to B252, which is explosive operation building, the maximum explosive weight is 500lbs from mixing area, hence using K-Factor (D=40W1/3) the distance comes out to be 317 ft. Actual distance is approximately 400 ft. The arc is shown in Fig. 4 and it shows that B252 is well beyond the arc.

Figure 1-B shows the arcs generated from the building.

Figure 2 shows section A-A from figure 1 plan layout and Figure 3 shows angle at which debris fly towards the mountain because 3 walls and the roof of the entire building is constructed of TM5-1300.

Table 1. Facilities within Inhabited Building Distance of new Building for MCA Project.

Building No	Description/Allowance
271M	Demolished
271K	Demolished
271N	Demolished
271L	Demolished
252	Explosive R&D Pilot Facility; 160 lb. 1.1; 500 lb. 1.3
252F	Magazine Storage; 30 lb. 1.1
247	Flare wind tunnel test facility.
234	Explosives processing/mfg; 55 lb 1.1; 60K 1.3; no limit 1.4
256	Inert Storage
256D	Inert Storage

Table 2. QD Arcs for Explosive Facilities within IBD of new building for MCA Project.

Building	Relationship to new Bldg.	N.E.W.,lb	Dist. Reqd. ft.	Actual Dist.,ft.
252	Intraline	160-1.1	105	380
252F	Intraline	30-1.1	66	280
247	IBD/K40	42-1.1 30K lb-1.3 no limit 1.4	145	950
234	Intraline	55-1.1 60K 1.3 no limit 1.4	175	1100

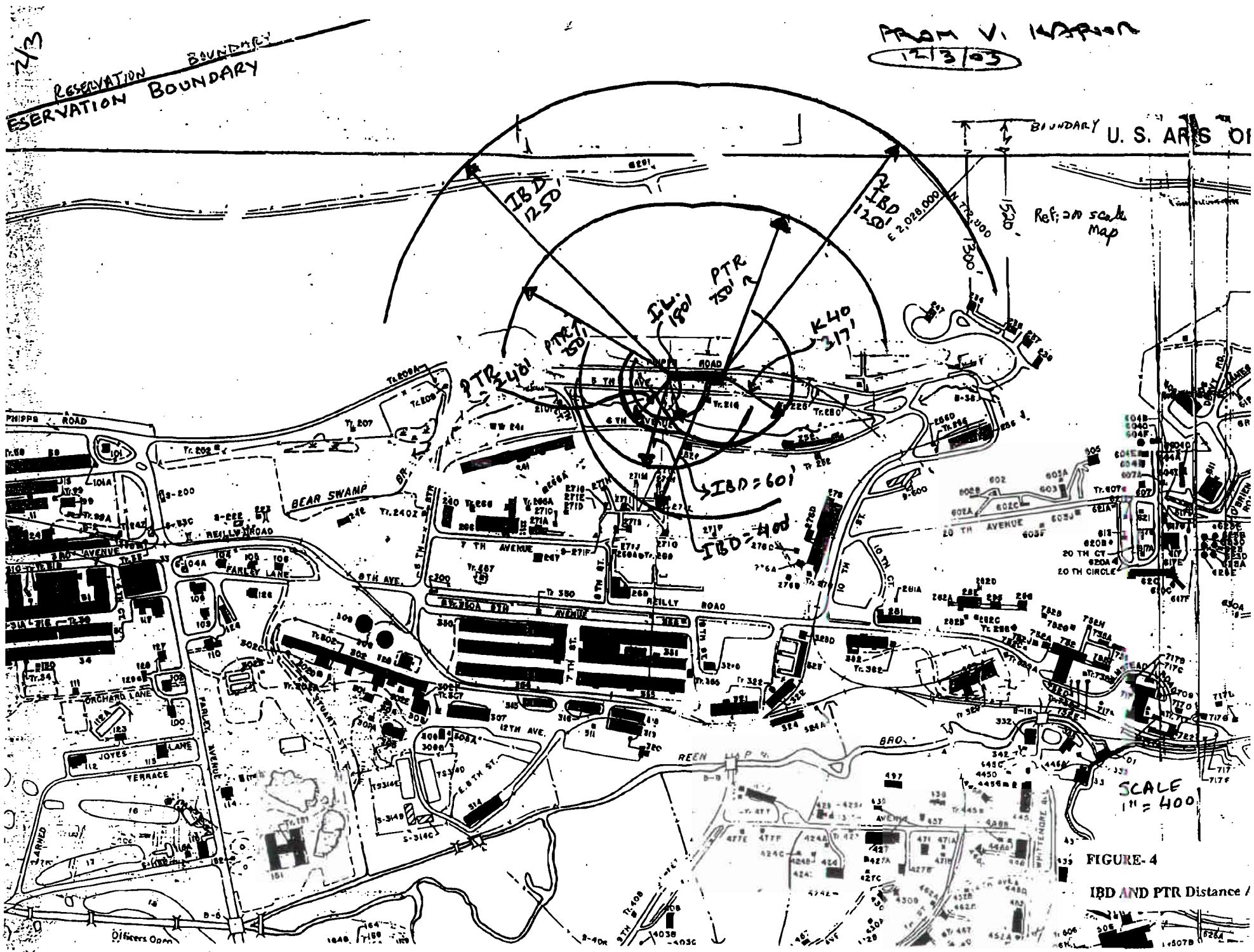


FIGURE- 4

IBD AND PTR Distance

IL INTRALINE DISTANCE

IBD INHABITABLE BUILDING DISTANCE

PTR PUBLIC TRAFFIC ROUTE DISTANCE

K 40? PROCESS RELATED FUNCTION WITHIN AREA

317'

ATTACHMENT D

ENVIRONMENTAL ASSESSMENT
for the
PICATINNY ARSENAL
EXPLOSIVES RESEARCH AND DEVELOPMENT
LOADING FACILITY

Prepared for

U.S. Army Tank-Automotive Armament Command
Armament Research, Development and Engineering Center
Picatinny Arsenal
Dover, New Jersey

Prepared by

ENVIRONMENTAL COMPLIANCE, INC.

and

FOSTER WHEELER ENVIRONMENTAL CORPORATION

July 2002

TABLE OF CONTENTS

Section	Title	Page No.
1.0	PURPOSE AND NEED FOR THE PROPOSED ACTION	1-1
2.0	DESCRIPTION OF THE PROPOSED ACTION	2-1
3.0	APPROPRIATE AND REASONABLE ALTERNATIVES CONSIDERED	3-1
4.0	AFFECTED ENVIRONMENT	4-1
4.1	Location and Land Use	4-1
4.1.1	Site #1	4-1
4.1.2	Site #2	4-2
4.1.3	Site #3	4-2
4.2	Geology and Soils	4-2
4.3	Air Quality	4-3
4.4	Surface Water	4-4
4.5	Wetlands	4-4
4.6	Floodplains	4-5
4.7	Flora and Fauna	4-5
4.7.1	Vegetation Resources	4-5
4.7.2	Wildlife Resources	4-6
4.7.3	Threatened and Endangered Species	4-6
4.8	Historic Resources	4-8
4.9	Noise	4-8
4.10	Transportation	4-8
4.11	Planting and Landscaping	4-8
5.0	ENVIRONMENTAL CONSEQUENCES OF PROPOSED ACTION AND THE ALTERNATIVES CONSIDERED	5-1
5.1	Location and Land Use	5-1
5.2	Geology and Soils	5-1
5.3	Air Quality	5-2
5.4	Surface Water	5-2
5.5	Wetlands	5-3
5.6	Floodplains	5-4
5.7	Flora and Fauna	5-4
5.7.1	Vegetation Resources	5-4
5.7.2	Wildlife Resources	5-4
5.7.3	Threatened and Endangered Species	5-5
5.8	Historic Resources	5-5
5.9	Noise	5-5
5.10	Transportation	5-6
5.11	Planting and Landscaping	5-6
5.12	Socioeconomics	5-7
5.13	Alternatives	5-7
6.0	CONCLUSION OR FINDINGS ON WHETHER THE ENVIRONMENTAL IMPACTS ARE SIGNIFICANT	6-1

Enviro Comment 4/30/96

TABLE OF CONTENTS (Continued)

Section	Title	Page No.
7.0	**LISTING OF PERSONS AND ORGANIZATIONS CONSULTED**	7-1
8.0	**REFERENCES**	8-1

LIST OF FIGURES

Number	Title	Page No.
1-1	Site Location Map	1-2
2-1	Site Plan Map	2-2

LIST OF TABLES

2-1	Existing Explosives Research and Development Loading Facility Buildings to be Demolished	2-3
4-1	Recommended Plant Species for USDA Plant Hardiness Zone 6	4-9
6-1	Alternatives Considered	6-3
6-2	Effects of the Picatinny Arsenal Explosives Research and Development Loading Facility on Resources of Principal National Recognition	6-7

LIST OF APPENDICES

Appendix A: Energetic and Chemical Materials to be Stored at the New Explosives Research and Development Loading Facility

LIST OF ACRONYMS AND ABBREVIATIONS

ARDEC	Armament Research, Development and Engineering Center
CAA	Clean Air Act
EWD	Explosives and Warheads Division
DOD	Department of Defense
ICUZ	Installation Compatible Use Zone
NAAQS	National Ambient Air Quality Standards
NESHAPs	National Emission Standards for Hazardous Air Pollutants
NJAC	New Jersey Administrative Code
NJDEP	New Jersey Department of Environmental Protection
NRHP	National Register of Historic Places
NWI	National Wetland Inventory
PEM	Palustrine Emergent Wetland
PFO1	Palustrine Forested, Broad Leaved Deciduous Wetland
PSS	Palustrine Scrub/Shrub Wetland
SESCP	Soil Erosion and Sediment Control Plan
SHPO	State Historic Preservation Office
TACOM	Tank-Automotive Armaments Command
USACE	United States Army Corps of Engineers
USC	United States Code
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
WMA	Watershed Management Area

1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

The U.S. Army Tank-Automotive Armaments Command - Armament Research, Development, and Engineering Center (TACOM-ARDEC) is located at the Picatinny Arsenal (Arsenal) in Morris County, New Jersey. The mission of the Center is the development of an armament, munitions, and chemical technology base along with modern smart weapon systems. Highly skilled engineers and scientists, as well as other military personnel comprise the work force. The Arsenal's Explosives and Warheads Division (EWD) supports the only Army owned and operated facilities for energetic materials. Their mission is to lead the Army in the research and development of new explosives and to maintain cutting edge technology for anti-armor warheads.

The Army has proposed the construction of a new explosives facility at Picatinny Arsenal (Figure 1-1). The proposed facility will consolidate an operation that is currently spread over 25 old and decrepit buildings. The construction of a new explosives facility is required to modernize and centralize research and development operations of new and improved energetic materials for warhead, tank, artillery, cannon caliber, and small arms.

The existing 25 buildings that currently comprise the explosives facility are spread over a one-mile area. With many of the buildings being as old as 60 years, they are substandard in modern safety, environmental, fire protection, and process controls. These facilities are marginally functioning with deteriorated plumbing, electricity, and physical structures. Major deficiencies in the existing buildings include: redundant heating/cooling systems, vacuum systems, and non-contact cooling water systems; limited overnight explosive magazine storage; inadequate temperature and humidity controls, plumbing, electricity, and lighting; and, leaking roofs on all buildings.

The issuance of repair orders and other administrative work associated with the constant repairs of the outdated explosives facilities, as well as down time during repairs, are preventing the EWD from efficiently performing its mission for the Army. If the proposed explosives facility is not constructed, the ability of the EWD to perform its duties will be severely hindered. Under the current conditions, the EWD cannot use their resources effectively or concentrate their efforts on developing, evaluating, and improving explosive formulations that are both cost-effective and environmentally friendly. In addition, increasingly stringent safety and environmental regulations could also impede the research and development of new explosive formulations at its existing location.

The EWD is in dire need of a modern facility for press loading, experimental cast loading, precision machining, and scale up of new high explosive formulations. This project would provide EWD with an integrated and centralized facility for a substantial operating and maintenance cost savings to the Government.

SOURCE: US Geological Survey 7.5-minute topographic map quadrangle for Dover, N.J. (1954, photorevised 1981).

SCALE: 1:24000

Approximate Alternative site locations denoted

Picatinny Arsenal, Morris County, New Jersey
Explosives Facility
Figure 1-1
Site Location Map

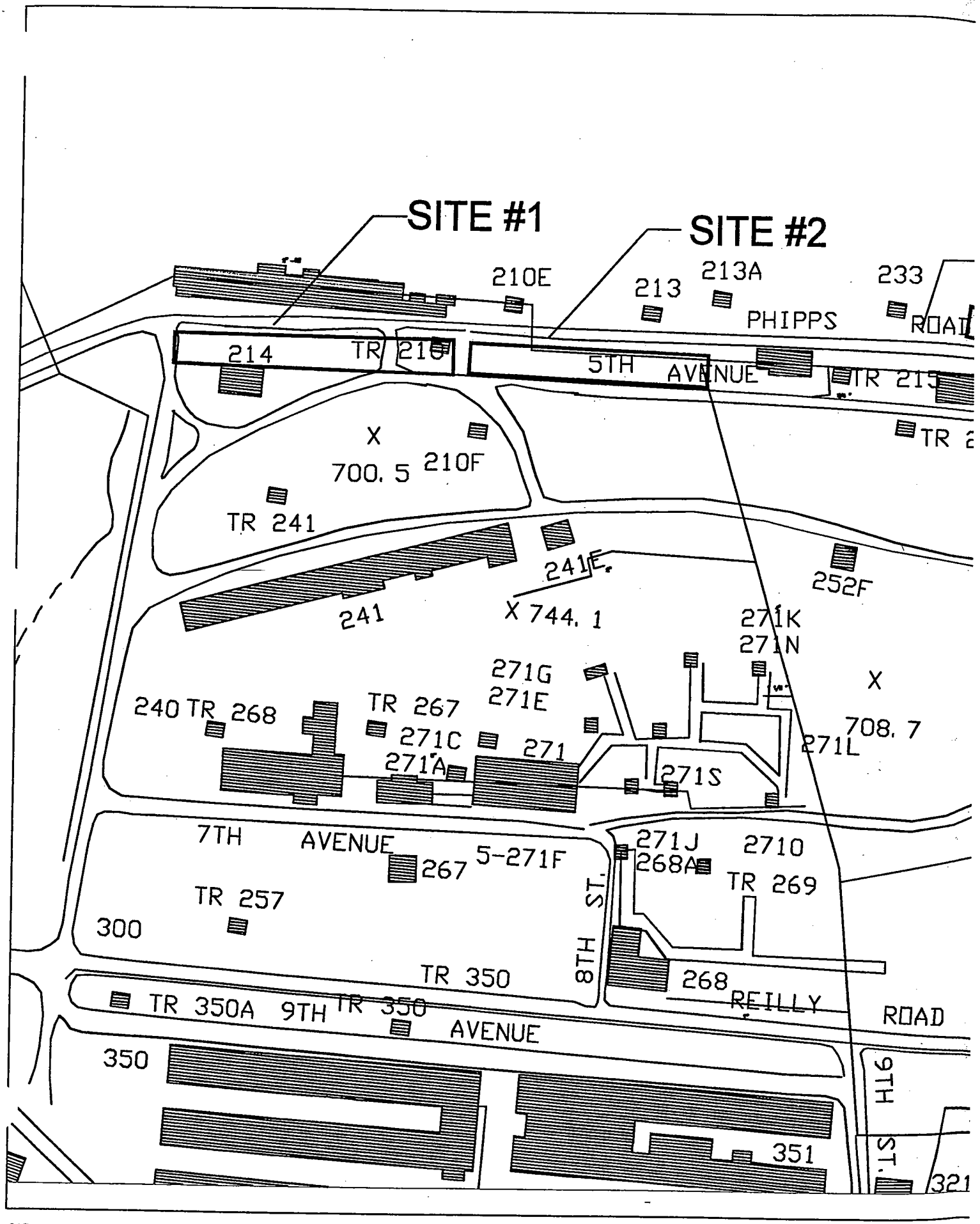
2.0 DESCRIPTION OF THE PROPOSED ACTION

The proposed action calls for the demolition of 25 widely scattered facilities that are currently used by the EWD. The existing facilities, most of which are 60 years old, will be replaced by a new, modernized facility that will centrally locate the explosives operations and meet current safety, accessibility, and construction standards. The new facility, as proposed, will include high bay areas, testing bays, storage areas, office areas, and ammunition storage magazines. The new facility will be enclosed with barricades on both sides. This facility will also include underground hot- and cold-water recirculators, a compressed air system, and a vacuum pump system. Explosion proof lighting, conducting flooring, and lightning protection system will be provided. Supporting facilities will include utilities; electrical service; sewer; storm drainage; paving, walks, curbs, and gutters; information systems; and site improvements. Heating, air conditioning, and access for the handicapped will be provided. New parking areas will also be constructed as part of the proposed action.

Three locations for the explosives facility were considered. Each of the sites is located in the west-central portion of the Arsenal (Figure 2-1).

Utilities will be extended to the new explosives facility from existing lines. Potable water lines will be provided for the proposed facility by the installation's water supply system, and sewage generated will be discharged to the Rockaway Valley Regional Sewerage Authority through the installation's pre-treatment plant.

Demolition of the existing explosives facility will occur following the completion of the new facility. Twenty-five buildings will be demolished for construction of the new explosives facility (Table 2-1). The existing 50+ year old structures are constructed of hollow clay tiles with corrugated transite asbestos roofs. Lead-based paint may exist in some of the structures. Most of the buildings are contaminated with energetics and will be manually demolished. Structures not explosively contaminated will be burned. Asbestos and materials contaminated with lead-based paint will be disposed of accordingly.



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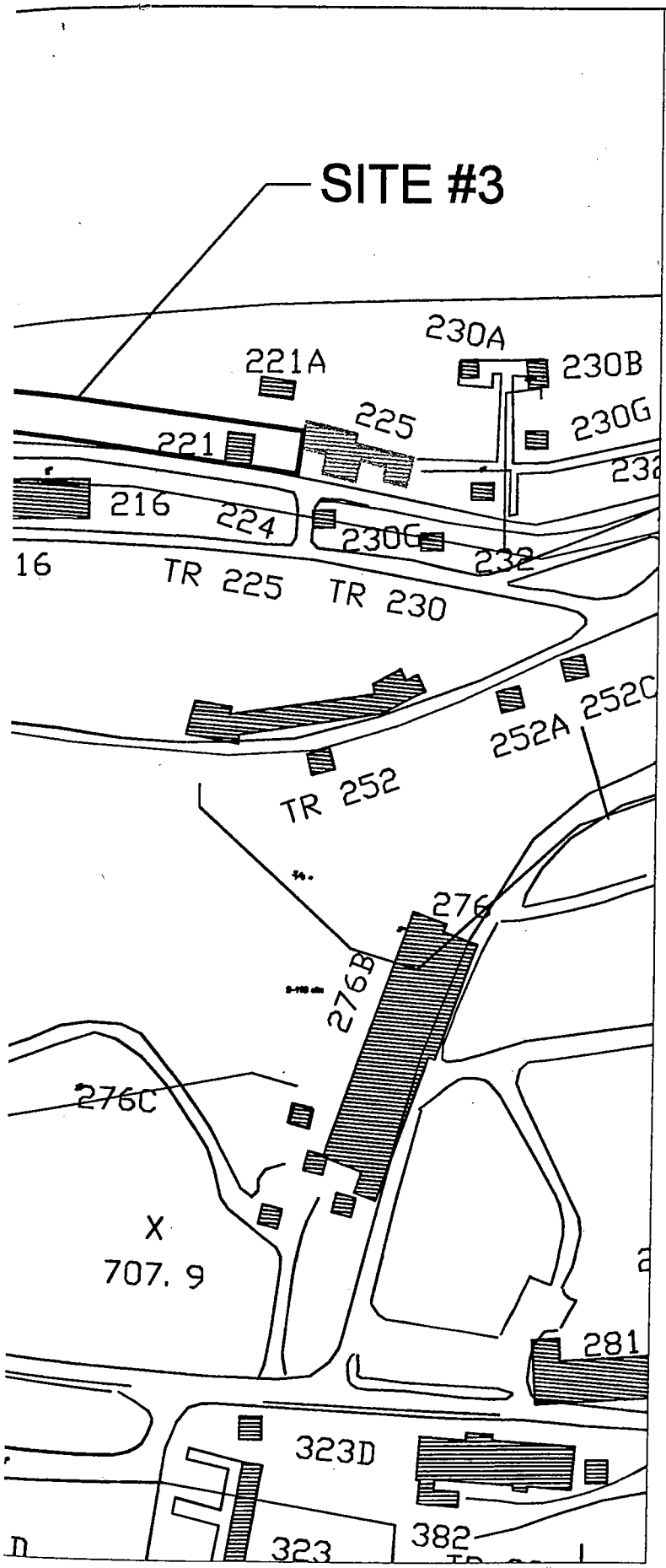

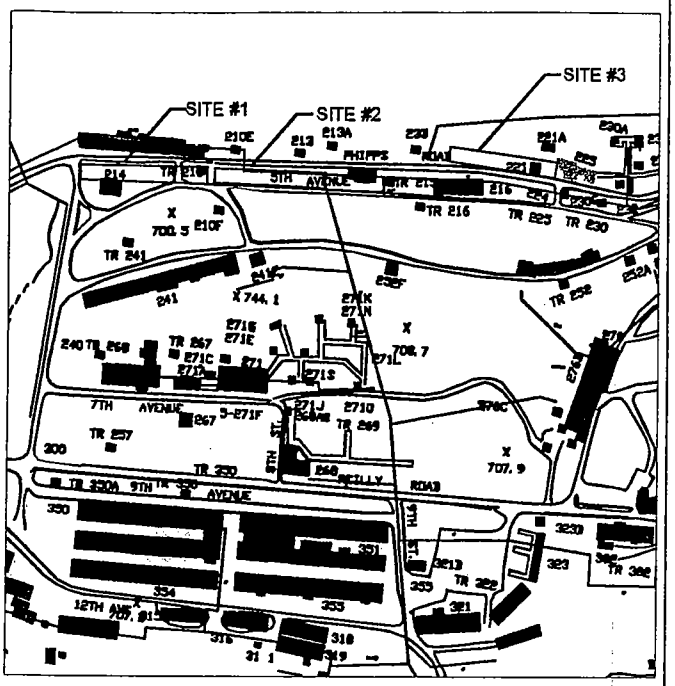

KEY PLAN

LEGEND

EXISTING BUILDING

PROPOSED BUILDING

0 20′ 40′ 60′

1″=20′-0″

THIS DRAWING PRODUCED ON AUTOCAD
DO NOT REVISE IT MANUALLY

PICATINNY ARSENAL
DOVER, NEW JERSEY

FIGURE 2-1
EXPLOSIVES
RESEARCH AND DEVELOPMENT LOADING FACILITY

FOSTER WHEELER ENVIRONMENTAL CORPORATION
MORRIS PLAINS, NEW JERSEY

Table 2-1
Existing Explosives Research and Development Loading Facility
Buildings to be Demolished

Building Number	Description
209	Storage Building
210	Fuze Assembly
213	Storage Building
214	Chang House
215	Ordnance Facility
216	Office
221	Sensitivity Test Laboratory
221A	Inert Storage
224	Control Room
225	Explosives Machining
230	Explosives Workshop
230A	Magazine Storage
230B	Magazine Storage
230F	Inert Storage
230G	Motor Room
232	Explosives Loading
232A	Unknown
232C	Unknown
232F	Motor Room
234	Ovens
235	Assembly and Packing
238	Pressing
252A	Flammable Material Handing
252C	Explosives Fabrication
408	Condemned Building

3.0 APPROPRIATE AND REASONABLE ALTERNATIVES CONSIDERED

The proposed action is to construct a new, state-of-the-art explosives facility at Site #1. Site #1 comprises approximately 40,000 square feet and measures approximately 400 feet long by 100 feet wide. The site includes approximately 6,912 square feet of paved area (Phipps Road and an unnamed road that connects Phipps Road to 5th Avenue). Approximately half of the unpaved portion of the site is covered with gravel and the remaining half consists of previously disturbed, open area vegetated with early successional vegetation and a few scattered trees.

This selection was made on the basis that the existing explosives facility is widely distributed and associated structures have deteriorated over the years to a point where it is not economical to repair them. The Arsenal considered three locations for the new facility, as described below and shown on Figure 2-1. The site location proposed by the Arsenal was selected because it consists of disturbed land with portions that have previously been developed. Construction of the facility at this location will limit potential adverse environmental impacts.

The following alternatives for the proposed action have been considered:

- Site #2
- Site #3
- No Action

These alternatives are discussed below:

Alternative 1: "Site #2"

Site #2 is located to the northeast of Site #1 and encompasses approximately 22,750 square feet (approximately 65 feet wide by 350 feet long). Phipps Road marks the site boundary to the northwest, while a second road, 5th Avenue, marks the southeast boundary. A steam line runs along the northeast boundary, and vacant land lies to the southwest. Early successional vegetation and scattered trees occupy this undeveloped site. The only structures present on this site include one valve and a fire hydrant.

Alternative 2: "Site #3"

Further to the northeast is the location proposed as Site #3. This site measures approximately 180 feet long by 100 feet wide. Buildings 221 and 221A are present on the site and will be demolished prior to the proposed construction. Additional structures on the site include four 12–foot high concrete columns, approximately 8 feet apart, supporting a steam line. The steam line bisects the site from the northeast to the southwest along the southeastern boundary. The remaining land associated with Site #3 consists of disturbed woodlands, a partially maintained lawn, and forestland.

Alternative 3: "No Action"

The "No Action" alternative would maintain the existing explosives facility at its existing size and location. This alternative was considered, but has been deemed not to meet the prescribed need of the proposed action due to the current deteriorated state and widespread distribution of the existing structures. Present conditions of the structures endanger the safety of the personnel who occupy them. Additionally, the distribution of the facility's structures reduces the efficiency of the mission.

4.0 AFFECTED ENVIRONMENT

This section presents a general description of Picatinny Arsenal and the resources that could potentially be affected by construction of a new explosives facility. The information contained in this section was primarily derived from Burt (2000). Additional details on these and other aspects of the environment at Picatinny can be found in that document. A reconnaissance level site visit was conducted on October 16 and 17, 2001 by Foster Wheeler Environmental Corporation. Information obtained during that visit is also included in the following sections.

4.1 Location and Land Use

Picatinny Arsenal occupies 6,491 acres of ridge and valley terrain in Morris County, New Jersey. The Arsenal is located 32 miles northwest of Newark and 42 miles west of New York City. The Delaware Water Gap is located 45 miles to the west. Surrounding communities include Wharton Borough (approximately 1 mile south of the Arsenal), Dover (approximately 3 miles south of the Arsenal), Denville Township, Rockaway Township, and Rockaway Borough (approximately 5 miles southeast of the Arsenal). According to the State of New Jersey, Department of Labor (2001), the populations of these communities in 1999 were 5,695, 16,006, 15,846, 22,009, and 6,316, respectively.

The United States Army Armament Research, Development and Engineering Center (ARDEC), located at Picatinny Arsenal, is a major research and development center under the U.S. Army Materiel Command. Functions operating at the Arsenal include research laboratories and test ranges. These functions are directly related to fulfillment of the installation's mission. One of the Arsenal's first missions was the development of pyrotechnic signals and flares. Other operations, including water treatment, housing, power plant, maintenance, and community and recreation facilities, exist to support that mission.

Large areas of the Arsenal are covered with forests (3,793 acres) and wetlands (approximately 1,250 acres). Due to the steep and rocky terrain of the ridges, development has occurred on the valley floor and on several plateaus. These developed plateaus are surrounded by essentially natural habitats.

The three alternative site locations considered for the new explosives facility all lie within the west-central portion of the Arsenal (Figure 2-1). A description of each of these sites is provided below.

4.1.1 Site #1 (Proposed Action)

Site #1 is located between Buildings 210 and 214 and includes a portion of Phipps Road. The site is bound by Building 210 to the northwest, an unnamed road that connects Phipps Road to 5th Avenue to the southwest, Building 214 and vacant land to the southeast and vacant land to the northeast. Approximately 40,000 square feet (400 feet long by 100 feet wide) of previously disturbed land comprises this site. Phipps Road and an unnamed road that connects Phipps Road to 5th Avenue account for approximately 6,912 square feet of paved area. An estimated 50% of the unpaved portion of the site is covered with gravel, while the remaining 50% consists

of open area vegetated with early successional vegetation and a few scattered trees. Structures observed on the site during the October 16 and 17, 2001 site reconnaissance include a ventilation system for Building 210 (approximately 20 feet by 22 feet), a monitoring well, five valves (6-inch steel pipe), a capped 4-inch steel pipe, an uncapped 6-inch pipe, and a locked metal box (3 feet by 4.5 feet). One manhole was observed on the site within Phipps Road.

4.1.2 Site #2

This site is located to the northeast of Site #1 and is bound by Phipps Road to the northwest, a steam line to the northeast, 5th Avenue to the southeast, and vacant land to the southwest. Site #2 is approximately 65 feet wide by 350 feet long and encompasses approximately 22,750 square feet. Structures present on Site #2 site include one valve and a fire hydrant. Early successional vegetation and scattered trees occupied the undeveloped site as observed during the October 16 and 17, 2001 site reconnaissance. Buildings 210E and 213 are located to the northwest of the site on the northwest side of Phipps Road.

4.1.3 Site #3

Site #3 lies to the northeast of Site #2 and measures approximately 180 feet long by 100 feet wide (about 18,000 square feet). The site is bound by forest to the northwest, forest and Building 225 to the northeast, Phipps Road to the southeast, and forest to the southwest. Buildings 221 and 221A are located within the site boundaries and will be demolished prior to the proposed construction. These structures occupy about 3,600 square feet. Additional structures on the site include four 12–foot high concrete columns, approximately 8 feet apart, supporting a steam line. The steam line bisects the site from the northeast to the southwest along the southeastern boundary. A partially maintained lawn (approximately 4,100 square feet), a disturbed wooded area (about 6,200 square feet) and forest (approximately 4,100 square feet) occupy the remaining lands associated with Site #3.

4.2 Geology and Soils

The Picatinny Arsenal area has two major geologic faults, the Green Pond Fault and the Mount Hope Fault. A longitudinal fault that runs parallel and along the trend of the western side of the valley, the Green Pond Fault, has a displacement of 1,500 feet, an uplift on the west side, and dips steeply to the northwest. The Mount Hope Fault is a high angle, strike-slip fault (horizontal movement) that runs across the valley trend (ARDEC 1996). The most recent earthquakes near the Picatinny area occurred from August 14 to November 3, 1969. The most severe of these earthquakes happened on October 6, 1969, measuring 1.25 on the Richter Scale.

Older precambrian bedrock (granitic gneiss) is present in the east and southeast portions of the Arsenal, while younger paleozoic bedrock (quartz conglomerate and sandstone) is located in the western and northwestern areas. Twenty-six soil types, derived from bedrock, glacial till, and colluvium, are present at the Arsenal. The soils are primarily coarse textured, principally sandy loams. The mountain range to the northwest has rough, stony land that formed on jagged, rocky slopes. The easterly slopes across the valley and the southern end of the mountain range contain primarily stony land and sandy clay loam soils. The soils of the central portion of Picatinny Arsenal consist of loamy, silty, sandy, and gravel clay pan soils, along with swampy areas consisting of peat and muck. Glacial till covers the western and eastern flanks of the Arsenal.

The southern end of the Arsenal consists of poorly sorted sands, gravels, and boulders bordered by a terminal moraine (ARDEC 1996).

According to the Soil Survey for Morris County, New Jersey, the three considered site locations consist of Rockaway very stony, sand loam (RrD), with 3 to 15 percent slopes. Rockaway series soils are well drained and moderately well drained upland soils that are subject to erosion. A Soil Erosion and Sediment Control Plan (SESCP) is required because of the size of the disturbed area, i.e., greater than 5,000 square feet of disturbance. The SESCP will be submitted to the Morris County Soil Conservation District for approval.

The site subsurface conditions are typical of glacial till geology. Generally, the soils on the proposed site consist of gravel, cobbles, and boulders in a silt or clay sand matrix. Groundwater readings following test borings range from 3 ¼ to 15 ¼ feet below the existing ground surface. Therefore, localized water could be encountered when excavating at the lower elevations of the site. It should be the responsibility of the construction contractor to implement appropriate mitigation measures including pumping and discharge of groundwater, springs, or perched water to enable foundation or earthwork operation. The construction contractor should also be aware that such work might require a dewatering permit.

Two monitoring wells (62MW-1 and 62MW-2) were observed on the site during the October 16 and 17, 2001 site reconnaissance. The depths of the wells are 30 feet for 62MW-1 and 31 feet for 62MW-2. The monitoring wells are equipped with ten-foot screens and were installed to measure past contamination that may have existed because of explosives manufacturing and hazardous waste storage.

4.3 Air Quality

Purpose?

Picatinny Arsenal is located within United States Environmental Protection Agency (USEPA) Region 2. Outdoor air quality is judged by comparing actual air pollutant amounts with the National Ambient Air Quality Standards (NAAQS) that have been established by the USEPA for six primary or "criteria" pollutants (carbon monoxide, nitrogen dioxide, ozone, lead, particulate matter with diameters of 10 micrometers or less, particulate matter with diameters of 2.5 micrometers or less, and sulfur dioxide). The State of New Jersey has established ambient air quality standards for the same pollutants covered by the NAAQS, with some variation in the primary and secondary standards for particulate matter and the secondary standards for sulfur dioxide. Primary standards define levels of air quality that are judged necessary to protect public health and secondary standards to protect public welfare.

The New Jersey Department of Environmental Protection (NJDEP) performs air pollution monitoring throughout New Jersey. Picatinny Arsenal lies in the Suburban Region, which includes Middlesex, Morris, and Somerset Counties. Monitoring stations within Morris County are located in Morristown and Chester. According to historical NJDEP air monitoring data (1985 to 2000), levels of carbon monoxide and ozone have exceeded the quality standards in Morristown and Chester, respectively (NJDEP, 2001). The 1990 amendments to the Clean Air Act (CAA) require that an agency's activities do not aggravate existing air quality violations or delay attainment status.

4.4 Surface Water

There are no surface water bodies or storm water drainage features located on the three sites considered for the new explosives facility. Green Pond Brook is listed by the Department of the Interior, Geological Survey (USGS) Topographic Map Quadrangle (7.5-minute series) for Dover, NJ (dated 1954 and photorevised in 1981), as the nearest body of water to the three considered site locations (approximately 1,750 feet to the southeast). Green Pond Brook feeds Picatinny Lake, located to the northeast of the three sites, and continues southwest from the lake where it empties into the Rockaway River. During the site reconnaissance, rivulets, not noted on the Dover USGS topographic map, were observed in Bear Swamp, located between 30 and 135 feet to the southeast of the three considered locations. One manhole was observed on Site #1 within Phipps Road and another manhole, also within Phipps Road, was observed approximately five feet to the southwest of Site #1. The manholes are associated with sewer lines.

The Arsenal is located within the Upper Passaic Watershed Management Area, known as Watershed Management Area 6 (WMA #6). WMA #6 includes the Rockaway, Whippany and upper Passaic Rivers above the confluence with the Pompton River and occupies approximately 416 square miles.

Impervious areas associated with the proposed explosives facility will include parking areas. These areas should be kept to a minimum by using the proper materials. Two types of paving materials (asphalt and sand or crushed stone) are permitted for parking surfaces at Picatinny Arsenal. Sand or crushed stone are environmentally preferable materials for parking lots as they are pervious. Stormwater drainage associated with the facility's parking areas will be tied into the existing Arsenal stormwater system.

4.5 Wetlands

Approximately 1,250 acres of wetlands are located within the boundaries of Arsenal. Wetlands were not observed on any of the three sites considered for the proposed explosives facility during the October 16 and 17, 2001 site reconnaissance. Additionally, natural and archeological resource maps prepared by the Waterways Experiment Station (U.S. Army Corps of Engineers, 1994) and the U.S. Fish and Wildlife Service, National Wetlands Inventory Map (NWI), 7.5-minute series for Dover, NJ, do not identify wetlands on any of the considered site locations.

A wetland complex (Bear Swamp), comprising palustrine forested, broad-leaved deciduous (PFO1), palustrine scrub/shrub (PSS), and palustrine emergent (PEM) components, was observed within 50 feet of Site #1 and Site #2 during the site reconnaissance (Figure 2-1). Site #3 is located approximately 135 feet northwest of the wetland complex. Dominant vegetation observed in the wetland during the site visit included red maple (*Acer rubrum*), sweet birch (*Betula lenta*), tussock sedge (*Carex stricta*), sensitive fern (*Onoclea sensibilis*), woolgrass (*Scirpus cyperinus*), and broadleaf cattail (*Typha latifolia*). The Waterways Experiment Station wetland map indicates a Red Maple wetland (USACE, 1994) and the NWI identifies a PFO1 wetland at this location. The resource value of any nearby wetlands has not been determined; therefore, it cannot be stated if any wetlands in the area are of exceptional resource value.

4.6 Floodplains

Based on the USACE's Waterways Experiment Station Draft Final Report (1994), the three considered locations for the proposed explosives facility do not lie within the annual, 100-year, or 500-year floodplains.

4.7 Flora and Fauna

4.7.1 Vegetation Resources

Approximately 67% (5,848 acres) of land at Picatinny Arsenal is forested. The upland forests include mixed oak and northern hardwood, with mixed oak being the most prevalent. Each of the three considered site locations is occupied by Mixed Oak, with Sites #1 and #2 also containing Non-Forested Lands (USACE, 1994). Vegetation types observed during the October 16 and 17, 2001 site reconnaissance include disturbed land vegetated with early successional vegetation, maintained lawn, mixed oak forest and woodlands. These vegetation types were also observed in the immediate vicinity of the sites and are typical of those found in Morris County, New Jersey. A more detailed description of vegetation observed at each site is provided below.

Site #1

The USACE's Waterways Experiment Station Draft Final Report (1994) identifies the area associated with Alternative #1 as Non-Forested Lands. During the October 2001 site reconnaissance, Site #1 was occupied by paved roads and disturbed land. Approximately 50% of the disturbed area was covered with gravel and the remaining 50% (about 16,544 square feet) was vegetated with early successional vegetation and a few scattered trees. Mature trees located on this site include four red oaks (*Quercus rubra*), two white oaks (*Quercus alba*), one sweet birch, and one red maple. Two small clusters of young trees are also present on the site, one along the southwest end of the site and the other near the ventilation system for Building 210. Tree species present within these clusters include red maple, sweet birch, quaking aspen (*Populus tremula*), eastern hemlock (*Tsuga canadensis*), white ash (*Fraxinus americana*) and American sycamore (*Platanus occidentalis*). Early successional vegetation observed included daisy fleabane (*Erigeron annuus*), common mugwort (*Artemisia vulgaris*), curled dock (*Rumex crispus*), clover (*Trifolium* sp.), goldenrod (*Solidago* sp.), common mullein (*Verbascum thapsus*), English plantain (*Plantago lanceolata*), yarrow (*Achillea millefolium*), thistle (*Cirsium* sp.), dogbane (*Apocynum cannabinum*), white vervain (*Verbena urticifolia*), butter-and-eggs (*Linaria vulgaris*), common milkweed (*Asclepias syriaca*), bluestem (*Andropogon gerardii*), and grass species.

Site #2

Site #2 is also identified as Non-Forested Lands according to the USACE's Waterways Experiment Station Draft Final Report (1994). During the October 2001 site visit, the area was occupied by early successional vegetation and scattered trees. Twenty-seven mature trees, consisting of red and white oaks, tulip trees (*Liriodendron tulipifera*), red maples, hemlocks, white ash, black oak (*Quercus velutina*), and chestnut oak (*Quercus prinus*) were present on the site, along with 16 young hemlocks. In addition to the early successional vegetation observed at Site #1, tulip tree and foxtail grass (*Alopecurus* sp.) were observed in the herbaceous layer and

Japanese barberry (*Berberis thunbergii*) and raspberry (*Rubus idaeus*) were present in the shrub strata.

Site #3

The USACE's Waterways Experiment Station Draft Final Report (1994) identifies Site #3 as Mixed Oak. Three communities were observed on the site during the October 2001 site reconnaissance: a somewhat-maintained lawn, disturbed woodlands, and forest. The approximately 4,100 square-foot lawn area is located along the site's southeastern edge between Building 221 and Building 216. The lawn area is approximately 40 feet wide and runs along Phipps Road. Queen Ann's lace, English plantain, moth mullein, common mullein, strawberry (*Fragaria virginiana*) and grass species were observed in the lawn area. The wooded area extends from the lawn area and behind Building 221 approximately 45 feet and includes about 6,200 square feet. Sweet birch, hemlock, and red oak dominated the tree strata, striped maple (*Acer pensylvanicum*) and American witch-hazel (*Hamamelis virginiana*) dominated the shrub layer, and common mullein and white snakeroot (*Ageratina altissima*) dominated the sparse herbaceous strata. The forested portion of the site (approximately 4,100 square feet) is located to the northwest of the wooded area and is dominated by sweet birch and tulip tree.

4.7.2 Wildlife Resources

The fish and wildlife community found at Picatinny Arsenal includes a wide variety of terrestrial mammals, birds, reptiles, and amphibians and is representative of the fauna of the northeastern United States. A total of 315 vertebrate species have been identified on the installation. These include 208 birds, 41 mammals, 26 fish, 21 amphibians, and 19 reptiles (ARDEC 1996). A blue jay (*Cyanocitta cristata*) and whitetail deer (*Odocoileus virginianus*) scat and tracks were observed on Site #1 during the October 2001 site reconnaissance. No wildlife were observed or heard in the Site #2 and #3 locations. Beaver (*Castor canadensis*) gnaw marks were observed on trees to the southeast of Site #1 in Bear Swamp.

4.7.3 Threatened and Endangered Species

One federally-listed endangered species, the Indiana bat (*Myotis sodalis*), and two federally listed threatened species, the bald eagle (*Haliaeetus leucocephalus*) and the bog turtle (*Clemmys muhlenbergi*), are known to occur at the Arsenal (Burt 2000). The peregrine falcon (*Falco peregrinus anatum*), identified in the Arsenal's Integrated Natural Resources Management Plan as a federally-listed transient species that may occur at the Arsenal, has been de-listed by the United States Fish and Wildlife Service. The bald eagle is considered to be a transient species, the Indiana bat a summer resident and the bog turtle a year round resident. A female Indiana bat was captured on the Arsenal in July 1995 and two male Indiana bats were caught on the Arsenal in the summer of 1997, suggesting a summer population of Indiana bats on or near the Arsenal. The locations of these captures were approximately 1.3 miles from the site. Hibernating Indiana bats have been discovered within 0.5 miles of the Arsenal (greater than 1.9 miles from the site), however; Indiana bat hibernacula have not been discovered on the Arsenal. A bog turtle sighting was confirmed in wetlands associated with the east branch of Green Pond Brook (greater than three miles from the site) in 1987. No bog turtle sightings have been reported at Bear Swamp, the wetland adjacent to the site, and Bear Swamp is not hydrologically connected to the Green Brook wetland.

The Indiana bat occurs in the eastern half of the United States, from northern Alabama up through New England. Indiana bat normally roost under the loose bark of dead, large-diameter trees throughout summer; however, living shagbark hickories (*Carya ovata*) and tree cavities are also used occasionally. Maternity roost sites in dead trees exposed to sunlight and located in upland forests and near streams are particularly important (Drobney and Clawson,). Suitable Indiana bat hibernating sites (cavernous areas) were not observed on or in the immediate vicinity of the three considered locations proposed for the explosives facility. Indiana bat roosting areas (mature trees) were located on and in the vicinity of all three proposed locations, and two potential foraging areas (riparian areas) are located within 2,000 feet of the proposed sites. Therefore, the summer population of Indiana bats, known to occur on or near the Arsenal, may use the three sites under consideration and/or surrounding areas for foraging and roosting.

Suitable bog turtle habitat is recognized by three criteria (suitable hydrology, soils and vegetation). Soils are the critical criterion (USFWS, 2000). Suitable hydrology is identified as having shallow surface water or saturated soils present year-round with shallow rivulets often present. Soils suitable for bog turtles consist of a soft muck substrate or scattered pockets of peat. Suitable vegetation consists of low grasses and sedges with a scrub/shrub component and an open canopy. If these criteria are present in the wetland (Bear Swamp), located to the southeast of the three proposed explosive facility locations, bog turtles could potentially occur in the wetlands. However, as indicated previously, bog turtles have not been documented in Bear Swamp.

Department of Defense facilities are not required to protect state-listed species. However, according to the Arsenal's Integrated Natural Resources Management Plan, there are ten state-listed endangered (eight birds, one snake, and one mammal) and eleven state-listed threatened (ten birds and one turtle) wildlife species known to occur at Picatinny Arsenal. Four of the state-listed endangered species, timber rattlesnake (*Crotalus horridus*), Cooper's hawk (*Accipiter cooperii*), red shouldered hawk (*Buteo lineatus*), and bobcat (*Lynx rufus*), and two of the state-listed threatened species, barred owl (*Strix varia*) and wood turtle (*Clemmys insculpta*) are identified as residing and breeding at the Arsenal. Two of the state-listed threatened bird species great blue heron (*Ardea herodias*) and northern goshawk (*Acipiter gentilis*) are identified as using the Arsenal property for foraging and nesting and foraging, respectively. The Cooper's hawk and northern goshawk are currently listed by the NJDEP as threatened and the great blue heron has been de-listed (NJDEP Natural Heritage Database, 2001). The remaining 13 state-listed bird species are listed as transient and using portions of the Arsenal during seasonal migrations (Burt 2000).

Based on maps generated to predict timber rattlesnake habitat within the Arsenal (WES, 1994), the area surrounding all three of the considered locations provides moderate to low potential summer (foraging) habitat for the timber rattlesnake. The same area provides no potential winter (hibernating) habitat for the timber rattlesnake, although the talus slope at the base of the hillside to the west of Site #1 is rated as high potential winter habitat. However, monitoring of this area over the past several decades has failed to produce sightings of timber rattlesnakes.

There are no known federally-listed endangered or threatened plants located on Arsenal property. Seven state-listed endangered plants, American featherfoil (*Hottonia inflata*), Robbin's pondweed (*Potamogeton robbinsii*), small burreed (*Sparganium minimum*), lesser bladderwort (*Utricularia minor*), wood reedgrass (*Cinna latifolia*), meadow horsetail (*Equisetum pratense*),

and large leaved holly (*Ilex montana*) occur on the Arsenal in aquatic or wetland areas (Burt 2000). Seven additional state-listed endangered plant species may potentially occur on the installation. A complete list of state and federal-listed species that occur or may occur at Picatinny Arsenal is provided in the Arsenal's Integrated Natural Resources Management Plan.

4.8 Historic Resources

Pan American Consultants, Inc. conducted an evaluation of 500 historic structures in June 1997 to determine their eligibility for inclusion on the National Register of Historic Places (NRHP). The evaluation resulted in 54 structures being recommended as eligible for listing to the NRHP as contributing structures to three historic districts, with four judged as non-contributing to a district. These evaluations, Architectural Assessment of Historic Structures at Picatinny Arsenal and Definitions of Historic Districts for Picatinny Arsenal, were presented to the New Jersey State Historic Preservation Office (SHPO) for comment in September 1998. According to the USACE Waterways Experiment Station Draft Final Report (1994), the two buildings located on Site #3 (Buildings 221 and 221A) are not listed on the NRHP. Additionally, there are no historical sites within the vicinity of the three considered sites proposed for the explosive facility.

4.9 Noise

A noise zone map developed by the U.S. Army Environmental Hygiene Agency as part of the Installation Compatible Use Zone (ICUZ) Study in 1993 indicates the level of noise generated from Installation activities and the compatibility of the generated noise with land uses on and off the Installation. Three different zones have categorized the relationship between environmental noise and land use: Zone I (compatible), Zone II (normally incompatible), and Zone III (incompatible). Zone I areas are suitable for noise-sensitive land uses such as residential housing, schools and medical facilities. Zone II and Zone III would not be appropriate for such land uses. Land uses compatible with Zone II or Zone III include various industrial and transportation facilities and some recreational activities. The three locations being considered for the explosives facility do not fall within a designated noise zone.

4.10 Transportation

Three levels of road hierarchy are found at Picatinny Arsenal. They consist of primary, secondary, and tertiary roads. Each of these levels can be further characterized by the visual assessments of rural, suburban, and urban. Primary roads provide major routes through the Installation, as well as connections between high use areas. The three site locations being considered for the explosives facility are situated on one of the Installation's secondary roads.

4.11 Planting and Landscaping

Picatinny Arsenal conveys a natural wooded image in its overall appearance and falls within Zone 6 of the United States Department of Agriculture (USDA) Plant Hardiness Map. Table 4-1 provides a list of recommended plant species appropriate for this zone. Additional plant lists have also been provided for special situations such as recommended street trees and parking lot plantings.

Table 4-1
Recommended Plant Species for USDA Plant Hardiness Zone 6[1]

Shade Trees	
Acer rubrum	Red maple
Fraxinus pennsylvanica	Marshall's Seedless Ash ("Marshall's Seedless")
Gleditsia triacanthos "inermis"	Thornless Honeylocust
Quercus palustris	Pin Oak
Tilia americana "Redmond"	Redmond Linden
Ornamental Trees	
Amelanchier canadensis x grandiflora	Autumn Brilliance Shadblow
Cersis canadensis	Eastern Redbud
Cratagegus crusgalli "Inermis"	Thornless Cockspur Hawthorn
Magnolia stellata	Star Magnolia
Evergreen Trees—large scale screen	
Pinus strobus	White Pine
Deciduous Shrubs	
Euonymus alatus "compactus"	Dwarf Winged Euonymus
Myrica pennsylvanica	Northern Bayberry
Viburnum lentago	Nannyberry
Evergreen Shrub	
Juniperus (species)	Junipers
Ilex glabra "Compacta"	Compact Inkberry
Kalmia latifolia "Elf"	Elf Mountain Laurel

[1]Native plants will be planted whenever possible.

5.0 ENVIRONMENTAL CONSEQUENCES OF PROPOSED ACTION AND THE ALTERNATIVES

5.1 Location and Land Use

Under the proposed action, there will only be minor changes to land uses at the project site. The current site location for the proposed explosives facility consists of previously disturbed land with some paved sections. The facility will be located primarily within the previously developed portion of the site and will occupy approximately 40,000 square feet of land area. Limited removal of trees is anticipated only where necessary for the construction of a new, centralized explosives facility. The proposed facility will use existing roadways and will not require the construction of additional roadways.

As the 25 existing explosives facility's structures are demolished, land will be allowed to naturally revegetate. Planting of various native species will also be conducted throughout the affected areas and will continue to convey the natural wooded image of the Arsenal. These plantings are expected to enhance the visual character of the land while providing additional habitat for resident animal species.

5.2 Geology and Soils

Picatinny Arsenal is located in the Reading Prong of the New Jersey Highlands. The bedrock underlying the site primarily consists of resistant Precambrian granitic gneiss. Surficial deposits of glacial and alluvioglacial sediments directly overlie the granitic gneiss.

The shallow water table is perched on a three to five foot deep fragipan, a natural subsurface horizon with high bulk density relative to the overlying surface horizons and very slowly permeable to water, recharges the underlying granitic gneiss below. The Precambrian igneous and meta-sedimentary bedrock has secondary porosity in its joints and fractures. If the bedrock is exposed and then covered with an impervious surface, recharge to the bedrock will be significantly decreased. The magnitude of this environmental impact will depend upon the utility and reliance upon nearby wells screened in the bedrock aquifer.

The two major geologic faults, the Green Pond Fault and the Mount Hope Fault, in the vicinity of the site are unlikely to impact or be impacted by demolition and construction activities at the site. Based upon historic records (refer to Section 4.2), seismic activity will probably not impact demolition and construction activities at the site.

Prior to the start of demolition and construction activities, clearance of all unexploded ordnance identified in the area must be completed. Construction of the new explosives facilities will include leveling the grade of the site. Grading requires blasting and removal of soil containing boulders, cobbles, and gravel. Excavation of boulders from the soil, identified as Rockaway very stony sandy loam (RpC), may be difficult.

Blasting conducted at the site during construction activities will not alter the physical composition of the geologic units at the site, but may result in minor environmental impact. The vibrations resulting from blasting may affect local slope stability, integrity of nearby structures

and wells, local groundwater flow patterns, and/or yield of nearby wells. In addition, temporary environmental impacts caused by blasting may include noise, uncontrolled flying rock, dust, and venting gases. The construction contractor should complete a blasting plan prior to starting work at the site to mitigate effects of blasting. The plan should include use of a blasting consultant; maintenance of a safe distance for personnel and structures from the blast site; inspection of the foundations of homes, wells, and septic tanks after the blast; and monitoring vibrations of the blast using seismic surveys and a soil particle velocity meter.

Construction plans do not detail the depth to which soil will be removed. If removal of the soil exposes the fragipan layer located between 18 and 30 inches below the ground surface, water is likely to seep along the top of the fragipan into the foundations of nearby buildings and deep excavations. The permeability of water is very slow in the underlying fragipan, which restricts vertical migration of water. The seepage must be intercepted to prevent flooding and erosion. It should be the responsibility of the construction contractor to implement appropriate mitigation measures including pumping and discharge of groundwater, springs, or perched water to enable foundation or earthwork operation. The construction contractor should also be aware that such work might require a dewatering permit.

If the bedrock is exposed, water will likely infiltrate into the joints and fractures of the bedrock. However, some horizontal migration of water may be expected due to the less pervious nature of the bedrock than the previously overlying soil.

Soil excavation may also increase and/or divert surface runoff, thereby increasing the potential for erosion. However, since water capacity in the soil is low, runoff and erosion potentials are only moderate. Steep slopes will be particularly susceptible to erosion during and after construction activities. The addition of impervious surfaces, such as pavement, with effective stormwater management will significantly reduce the erosion potential created by construction activities at the site. In locations where the bedrock is exposed, erosion potential is expected to be very low. The construction contractor should implement erosion control practices such as early revegetation, breaking slopes with diversions and cross streets, and temporary vegetation covers. A SESCP is required because of the size of the disturbed area. The SESCP will be submitted to the Morris County Soil Conservation District for approval.

5.3 Air Quality

Demo of ACM / LBP by Plaintiff's contractor

Any existing asbestos roofing materials from the structures to be demolished will be removed and disposed of in accordance with National Emission Standards for Hazardous Air Pollutants (NESHAPs) regulations and any other applicable federal, state, and local regulations. The removal of any lead paint will also be conducted to avoid contact with the affected environment. Other effects on air quality may include the short-term, temporary road dust that will likely result from truck traffic during construction and demolition.

A long-term benefit to air quality could result from a decrease in traffic in and around the Arsenal. The traffic decrease is expected as a result of centralized facilities.

Paving per Parts 2 and 3 of 01010

5.4 Surface Water

The proposed demolition of existing explosives facilities will decrease the amount of impervious areas through revegetation of land underlying existing structures. The proposed construction will remove existing vegetative cover and decrease the number of pervious areas. In addition to the impervious ground surfaces, rooftops on the proposed structure, as well as a parking area, will likely add increased amounts of runoff to the total volume from the site. The increase in impervious ground surfaces resulting from construction of the new facilities will be offset by the proposed demolition of 25 structures associated with the existing explosives facility. Demolition of existing structures would decrease the net amount of impervious area through natural revegetation of affected areas.

To minimize the environmental impact associated with runoff, stormwater management is essential. According to the state, the post-construction rate of runoff should be limited to 75 percent of the pre-development runoff rate for the 100-year and the 10-year storms, and to 50 percent of the pre-development rate for the 2-year storm.

The addition of impervious areas should be kept to a minimum by using the proper materials. For example, two types of paving materials are permitted for the parking surfaces at Picatinny. The first is asphalt, which is used for primary parking lots adjacent to buildings. The second, and preferred, paving material is compacted sand or crushed stone that is pervious and should be used for parking lots in residential areas. However, maintenance schedules, construction requirements, and use restrictions outlined in N.J.A.C. 7:13-2.8 should be observed even though the project is located outside of the flood hazard zone.

5.5 Wetlands

There are no wetlands located on the site identified for the proposed development; however, Bear Swamp, an approximately 12-acre wetland complex, is located to the south and southeast. Portions of this wetland complex are within 50 feet of the proposed site. The NJDEP also regulates adjacent upland areas or "transition areas." Transition areas serve as an ecological transition zone from uplands to freshwater wetlands and are an integral portion of the wetland ecosystem. They provide temporary refuge for freshwater fauna during high water episodes, are habitat for breeding, spawning, nesting, and wintering, are a natural remediation and filtration area to remove and store nutrients, sediments, petrochemicals, and other contaminants, and also act as a sediment and storm water control zone.

The regulated widths of transition areas range from 50 to 150 feet depending on the resource value of the associated wetland. Wetlands providing habitat for threatened and endangered species are considered a wetland of an exceptional resource value and are assigned a transition area of 150 feet.

Protective measures, such as silt fencing and hay bales will be employed to minimize impacts to the wetland area during construction, the closest border of the proposed site is located approximately 50 feet the Bear Swamp wetland complex. A vegetated buffer will be maintained between the facility and this wetland. Consequently, the construction and operation of the explosives facility at Site #1 will likely have minimal adverse impacts to this wetland.

5.6 Floodplains

As delineated by the USACE, the proposed site for the new explosives facility and the existing structures to be demolished throughout the Arsenal lie outside of the 100-year floodplain. Therefore, the proposed action would have no impact on the floodplain.

5.7 Flora and Fauna

5.7.1 Vegetation Resources

As mentioned previously, the land area where the new explosives facility will be constructed is largely undeveloped, previously disturbed land. It is estimated that over half of this parcel is either paved road or covered with gravel. The remaining area consists of open land with early successional vegetation and a few scattered trees. Mature trees located on this site include four red oaks (*Quercus rubra*), two white oaks (*Quercus alba*), one sweet birch, and one red maple. Two small clusters of young trees are also present on the site and include red maple, sweet birch, quaking aspen (*Populus tremula*), eastern hemlock (*Tsuga canadensis*), white ash (*Fraxinus americana*) and American sycamore (*Platanus occidentalis*). Observed early successional vegetation included daisy fleabane (*Erigeron annuus*), common mugwort (*Artemisia vulgaris*), curled dock (*Rumex crispus*), clover (*Trifolium* sp.), goldenrod (*Solidago* sp.), common mullein (*Verbascum thapsus*), English plantain (*Plantago lanceolata*), yarrow (*Achillea millefolium*), thistle (*Cirsium* sp.), dogbane (*Apocynum cannabinum*), white vervain (*Verbena urticifolia*), butter-and-eggs (*Linaria vulgaris*), common milkweed (*Asclepias syriaca*), bluestem (*Andropogon gerardii*), and grass species.

While limited tree removal is anticipated, a worst-case scenario would result in the removal of all site trees and vegetation to allow for the construction of the centralized explosives facility. Because various types of development (e.g., roads, buildings, cleared areas, and paved areas) currently surround this site, the impact is considered to be minor.

To minimize impacts to vegetation, limited tree clearing will occur where feasible and areas that have been cleared of vegetation and not developed will be planted with native plant species following completion of construction. This will accelerate reestablishment of vegetative cover and prevent colonization by weedy invasive species. Native species will also be used for the site's landscaping. (Refer to Section 4.11 for a description of replanting and landscaping plans.) Following demolition of the existing explosives facilities, affected land areas will also be replanted with native vegetation. This will result in an increase of vegetated areas over the long term.

5.7.2 *Wildlife Resources*

Wildlife species that occur within the proposed construction and demolition sites would potentially be affected. Impacts on wildlife species could include disturbance, displacement, and possible mortality. Mobile species would be displaced to comparable off-site habitat during site clearing and construction, resulting in only minor, short-term impacts. Less mobile species such as reptiles, amphibians, small mammals, as well as bird nests would be more directly affected by the proposed development and could be destroyed if they exist in the area to be cleared. To

minimize impacts to wildlife, any animals encountered during construction should be avoided and not destroyed. Site clearing should also be restricted to the non-breeding season for birds.

5.7.3 *Threatened and Endangered Species*

The federally-listed, endangered, Indiana bat is known to inhabit the Arsenal property during the summer months. Three individuals have been captured on the Arsenal property: one female in 1995 and two males in 1997 during a survey conducted by Boston University. However, Indiana bats have not been observed at the proposed site location. The Army will inspect the proposed site for potential summer roosting habitat of the Indiana bat. Although some mature trees do exist on the site, the fragmented nature of the trees and the surrounding development limit the suitability of these trees for use by the Indiana bat. Due to the absence of Indiana bat roosting (mature trees), hibernating (cavernous areas), and foraging (riparian areas) areas on the site, adverse effects to the Indiana bat or its habitat as a result of the construction of the explosives facility are not anticipated. However, three Indiana bat hibernacula are known to occur within five miles of the proposed project site and transient Indiana bats my use the site trees during summer months. Therefore, tree removal will be restricted from April 1 through November 15. Consequently, impacts to the Indiana bat resulting from project-related tree removal are anticipated to be negligible and the proposed project, following the above seasonal restriction, is not likely to adversely affect the Indiana bat.

The federally-listed threatened bog turtle was observed in 1987 on Picatinny Arsenal in wetlands associated with the east branch of Green Pond Brook that were located greater than 3 miles from Site #1. This wetland was not hydrologically connected to the wetlands adjacent to Site #1, consequently, the project will not adversely affect the bog turtle.

Potential winter den habitat of the timber rattlesnake is located to the northwest of Site #1, although timber rattlesnakes have not been sighted in the vicinity of the site. Potential den habitat in this area may be susceptible to collapse as a result of blasting during construction.

5.8 Historic Resources

None of the 25 structures that will be demolished as part of the proposed activities are listed on the NRHP as properties containing historical significance. Any remaining structures that are currently listed or are eligible for listing on the NRHP would be unaffected by the proposed construction activities. The SHPO will be consulted prior to the start of construction activities.

by Picatinny, or Contractor?

5.9 Noise

The proposed construction of the new explosives facility and the subsequent demolition of existing structures will have minimal short-term impacts on noise. It is expected that the noise generated from construction related equipment will elevate existing noise levels in the project area. This equipment is expected to operate on weekdays during daylight hours. Once construction and demolition are complete, noise in the project area will return to levels typical of the area.

Over the long-term, noise levels in the project area will benefit from the proposed action. By centralizing the explosives facility, the noise generated from traffic will be reduced throughout the area.

5.10 Transportation

The proposed action will use existing roadways and will not require the construction of any additional roadways. The site is situated on one of the Arsenal's secondary roadways. During the construction of the new explosives facility and the subsequent demolition of existing structures, the presence of construction equipment and construction workers' vehicles will have short-term impacts on traffic throughout the Arsenal. These additional vehicles will most likely increase traffic during the early morning and late afternoon hours when workers are commuting to and from the site. However, because the site is located on a secondary road, these impacts are expected to be minimal.

Once the project is complete, roadways in and around the installation will likely see a decrease in the amount of vehicular traffic, resulting in a long-term benefit to transportation. As the 25 existing buildings currently associated with the explosives facility are demolished and workers are relocated to centralized facilities, workers will no longer need to rely on vehicles for transportation to and from various buildings. Despite these potential effects, the character of existing roadways will probably not change.

5.11 Planting and Landscaping

The use of tree species that currently exist in the area will enhance the image of the proposed development and will help to maintain the Arsenal's woodlands image. A tree survey should be compiled to inventory the location, species, size, and condition of existing trees prior to site planning. The use of native plant materials will be continued whenever possible. Native plants require less maintenance and irrigation and will blend in with existing wooded areas, thus creating a more consistent planting scheme within the surroundings. Native plant materials are also recommended in the more rural settings found throughout the installation. However, non-native (but acclimated) species can be introduced in densely developed areas.

Tree preservation techniques are important considerations when there is a desire to save existing trees. Care should be taken to protect the root system from compaction caused by construction equipment and the placement of fill and debris over the root zone.

Potential species to be planted as indicated in Section 4.11 serve as references only. An analysis of microclimate and other site constraints and design goals must be considered prior to the selection of suitable plant material for a specific area. Consideration should be given to the selection of appropriate tree species for parking areas. Trees with shallow root systems and those which produce fruit, sap, or have thorns should be avoided. A planting plan that uses three to five species is also less likely to produce a monoculture that could result in the loss of all the trees if they are susceptible to a pest or disease. A variety of tree species also provides a variety of colors, textures, and heights.

5.12 Socioeconomics

The proposed construction of a new explosives facility and the subsequent demolition of existing structures will have primarily short-term, minor impacts to existing socioeconomic resources. The Arsenal is proposing to spend approximately $10.4 million to complete this project, which is expected to take approximately 24 months to complete. Local workers would be employed on a full- or part-time basis for the duration of the project. Workers involved in the construction and demolition activities would be from the local labor markets, with no significant migration of workers expected. Project construction/demolition personnel spending at area retail locations, eating and drinking establishments, gasoline stations, and other businesses in the surrounding area will provide short-term benefits to the area's economy. In the long-term, it is not expected that employment needs for facility maintenance will differ from existing staffing levels. Existing, full-time employees are also expected to conduct any plantings that are proposed under this alternative. Because the proposed action will reduce the overall number of buildings associated with explosives operations, there will be no need for increases in services such as fire and police.

5.13 Alternatives

Three alternatives were considered for the proposed project. This section assesses Sites #2 and #3 and the no-action alternatives.

Alternative 1: "Site #2"

Location and Land Use

This alternative addresses construction of the proposed facility at Site #2 (refer to Section 3.0 for a general site description). The site is currently undeveloped and is occupied by early successional vegetation and scattered trees. Development of this site would involve removal of trees and other vegetation as required, changing the current land use characteristics at the site.

Geology and Soils

Impacts from this alternative on geology and soils would be similar to those identified for the Proposed Action.

Air Quality

Impacts to air quality related to construction of a new explosives facility at Site #2 would be the same as those identified for the proposed action.

Surface Water

Activities associated with the construction of an explosives facility at Site #2 would have similar effects as those described for the Proposed Action.

Wetlands

Site #2 is located within 25 feet of a wetland (Bear Swamp). This alternative is located closer to wetlands than Site #1 (Proposed Action) and would occupy a larger percentage of the transition area. Therefore, construction and operation activities at the Site #2 location would have greater

adverse indirect impact to wetlands than Site #1, although adverse impacts to wetlands would be minor as the existing transition area is largely unvegetated.

Floodplains

Floodplains associated with Site #2 would not be impacted by the construction of a new explosives facility.

Terrestrial Flora and Fauna

Effects on vegetation, wildlife and threatened or endangered species would be greater to those described for the proposed action. When compared to Site #1 (Proposed Action), Site #2 contains a larger number of mature trees that would potentially be removed by the construction at this location. As stated under the Proposed Action, removal of trees will occur on an as needed basis. Although no wildlife species were observed on the site during the October 2001 site reconnaissance, impacts on wildlife species could include disturbance, displacement, and possible mortality.

The scattered nature of mature trees associated with Site #2 creates a broken canopy, which is adjacent to an area containing open water (Bear Swamp). These elements provide potential foraging habitat for the Indiana bat. In comparison to Site #1, Site #2 contains habitat that is better suited for use by the Indiana bat, therefore, resulting in greater adverse impacts to the Indiana bat due to loss of potential foraging habitat. However, this impact would be minor as the reduction of potential foraging habitat would represent a fractional percentage of available foraging habitats on the Arsenal.

Moderate to low potential summer (foraging) habitat is present within the forested portion of the Site 3 alternative. However, the area selected for development would represent only a fraction of the timber rattlesnake habitat available at the Arsenal, and the construction and operation of the explosives facility at Site #2 would result in minor impacts to potential summer timber rattlesnake habitat. Potential winter den habitat of the timber rattlesnake is located to the northwest of Site #2. Potential dens may be susceptible to collapse as a result of blasting during construction.

Historic Resources

Construction of an explosives facility at this site would have no effect on historic resources.

Noise

Activities related to the construction of a new explosives facility at Site #2 would be expected to generate low levels of additional noise over the short-term, similar to that described for the Proposed Action. Following completion of the decommissioning activities, noise levels in the project area will benefit from construction of a new facility at this site. By centralizing the explosives facility, the noise generated from traffic will be reduced throughout the area.

Transportation

Impacts to transportation related to the construction of a new explosives facility at Site #2 would be the same as those identified for the proposed action.

Planting and Landscaping

Construction of a new explosives facility at Site #2 would have similar impacts to planting and landscaping as those identified for the proposed action.

Socioeconomics

Impacts to socioeconomic resources as a result of construction of a new explosives facility at Site #2 would be the same as those identified for the proposed action.

Alternative 2: "Site #3"

Location and Land Use

This alternative addresses construction of the proposed facility at Site #3 (refer to Section 3.0 for a general site description). The site is currently comprised of a partially maintained lawn, a disturbed wooded area, and forested land. Two buildings and a steam line with support structures also occupy this site. Development of this site would result in minor changes to the current land use characteristics at the site.

Geology and Soils

Impacts from this alternative on geology and soils would be similar to those identified for the Proposed Action.

Air Quality

Impacts to air quality related to construction of a new explosives facility at Site #3 would be the same as those identified for the proposed action.

Surface Water

Activities associated with the construction of an explosives facility at Site #3 would have similar effects as those described for the Proposed Action.

Wetlands

Site #3 is located approximately 135 feet from the wetland boundary of Bear Swamp, the farthest distance from wetlands of all the alternatives. The Site #3 alternative would result in lesser impacts to the Bear Swamp wetland than Site #1 or Site #2 because of its distance to the wetland boundary.

Floodplains

Floodplains associated with Site #3 would not be impacted by the construction of a new explosives facility.

Terrestrial Flora and Fauna

Effects on vegetation, wildlife and threatened or endangered species would be similar to those described for the proposed action. When compared to Site #1 (Proposed Action), Site #3 contains a greater number of mature trees that could possibly be affected by the construction at this location. Because the forested area is in an area of various types of development (*e.g.*, roads, buildings, cleared areas, and paved areas), the impact is considered to be minor. Removal of trees will occur on an as-needed basis. Although no wildlife species were observed on the site

during the October 2001 site reconnaissance, impacts on wildlife species could include disturbance, displacement, and possible mortality of less mobile species.

The number of mature trees located at Site #3 is greater than Site #1 (Proposed Action); however, they form a tighter canopy and are located farther from the riparian areas. Therefore, Site #3 would have less of an adverse impact to the Indiana bat than Site #1 and Site #2.

Moderate to low potential summer (foraging) habitat is present within the forested portion of the Site #3 alternative. However, the area selected for development would represent only a fraction of the timber rattlesnake habitat available at the Arsenal, and the construction and operation of the explosives facility at the Site #3 would result in minor impacts to potential summer timber rattlesnake habitat. Potential winter den habitat of the timber rattlesnake is located to the northwest of Site #3. Potential dens may be susceptible to collapse as a result of blasting during construction.

Historic Resources

Construction of an explosives facility at this site would have no effect on historic resources.

Noise

Activities related to the construction of a new explosives facility at Site #3 would be expected to generate low levels of additional noise over the short-term, similar to that described for the Proposed Action. Following completion of the decommissioning activities, noise levels in the project area will benefit from construction of a new facility at this site. By centralizing the explosives facility, the noise generated from traffic will be reduced throughout the area.

Transportation

Impacts to transportation related to the construction of a new explosives facility at Site #3 would be the same as those identified for the proposed action.

Planting and Landscaping

Construction of a new explosives facility at Site #3 would have similar impacts to planting and landscaping as those identified for the proposed action.

Socioeconomics

Impacts to socioeconomic resources as a result of construction of a new explosives facility at Site #3 would be the same as those identified for the proposed action.

Alternative 3: "No Action"

Location and Land Use

The "No Action" alternative considered by the Arsenal involves the continued maintenance of existing explosives facilities with no enhancements. This alternative would maintain existing land uses in their current condition.

Geology and Soils

Geology and soils would not be impacted by this alternative, as no construction or demolition activities would take place. Similarly, stormwater runoff would not be impacted by this alternative.

Air Quality

The continued maintenance of existing explosives facilities with no enhancements would have no effect on air quality.

Surface Water

No effects to surface water would result from implementation of this alternative.

Wetlands, Floodplains, Terrestrial Flora and Fauna

Maintaining the existing explosives facilities in their current condition with no construction or demolition activities would result in no impacts to wetlands, floodplains, vegetation, wildlife and threatened or endangered species.

Historic Resources

This alternative provides for the existing explosives facilities to be maintained in their current condition. None of these structures are listed on the NRHP as properties containing historical significance. Therefore, historic resources would not be affected under this alternative.

Noise

Maintaining the existing explosives facilities in their current condition would have no effect on noise levels within or adjacent to the project area.

Transportation

Maintaining the existing explosives facilities in their current condition with no enhancements would have no effect on transportation within the Arsenal.

Planting and Landscaping

This alternative would not have any effect on the existing landscape and therefore would not require any re-planting activities.

Socioeconomics

The no action alternative would maintain existing explosives facilities in their current size, configuration, and condition. This alternative would have no effect on existing socioeconomic resources of the Arsenal or the surrounding area.

6.0 CONCLUSION OR FINDINGS ON WHETHER THE ENVIRONMENTAL IMPACTS ARE SIGNIFICANT

This section summarizes the conclusions regarding the proposed action for the explosives facility and the alternatives considered by the Picatinny Arsenal. Section 2 of this document contains a description of the proposed action by the Arsenal, while Section 3 describes reasonable alternatives that were considered. The evaluation of the existing explosives facilities includes the following four alternatives:

(1) Construction of a new, state-of-the-art explosives facility as proposed by the Arsenal at Site #1. This alternative proposes the demolition of 25 existing structures and the construction of a new, modernized facility that will centrally locate explosives operations. The new facility will meet current safety, accessibility, and construction standards.

(2) Construction of a new, state-of-the-art explosives facility at Site #2. Except for the site location, this alternative is identical to the Proposed Action.

(3) Construction of a new, state-of-the-art explosives facility at Site #3. Except for the site location, this alternative is identical to the Proposed Action.

(4) No action alternative, resulting in no change to the current explosives facilities. Existing structures would be maintained with no enhancements.

Table 6-1 summarizes the anticipated environmental effects for the alternatives considered. As can be seen from the table, implementation of the Proposed Action would have the most significant impacts on geology, stormwater runoff, and threatened and endangered species habitat.

An increase in impervious surface (i.e., pavement) could reduce the amount of recharge to underlying bedrock. Reducing or avoiding the amount of bedrock that is exposed and then covered with an impervious surface could minimize the magnitude of this environmental impact. Also, the amount of impervious surface can be kept to a minimum by using material such as compacted sand or crushed stone as an alternative to asphalt paving. Such actions will also help to prevent any flooding or erosion due to seepage of water into the fragipan.

Although construction of the proposed explosives facility will likely increase the amount of impervious ground surface, subsequent demolition of existing structures will more than off-set that effect by allowing affected areas to revegetate. It is expected that a net decrease in impervious ground surface will result.

The proposed actions would result in a minor loss or degradation of potential habitat for the federally-listed endangered Indian bat, and the state-listed endangered timber rattlesnake. Mature trees suitable for summer roosting habitat of the Indiana bat will be removed during construction. The proposed location or its alternatives would also result in a loss of moderate to low potential timber rattlesnake foraging habitat as a consequence of construction and operation and a possible degradation of potential timber rattlesnake winter den habitat as a consequence of blasting. The loss or possible degradation of these potential habitats would result in a minor adverse impact to these species as their use of these areas is undocumented and removal of this habitat would represent a small fraction of available habitat at the Arsenal.

In addition to the potentially adverse impacts described above, the proposed action is expected to benefit noise levels and transportation at the Arsenal. By centralizing the explosives facility, workers will no longer need to rely on their vehicles to travel between buildings. As a result, traffic and the noise generated from traffic will be greatly reduced throughout the area. A reduction in traffic could also help to improve the air quality of the surrounding area by decreasing the amount of exhaust entering the environment. Effects of the proposed project on resources of principal national recognition are summarized in Table 6-2.

Although the proposed action will likely have both positive and negative effects on environmental resources, as described above, any adverse effects will be far outweighed by the benefits. Unless action is taken, the ability of the EWD to perform its duties will be severely hindered. Under current conditions, the EWD cannot use their resources effectively or concentrate their efforts on developing, evaluating, and improving explosive formulations that are both cost-effective and environmentally friendly. In addition, the research and development of new explosive formulations at the new location would be conducted under improved safety conditions.

Table 6-1
Alternatives Considered
Sheet 1 of 4

RESOURCES	PROPOSED ACTION (SITE #1)	SITE #2	SITE #3	NO ACTION
Location and Land Use	Minor changes to land uses at the proposed project site are expected. Limited removal of trees is anticipated only where necessary. Existing roadways will be utilized. Natural revegetation and plantings will enhance visual character and provide additional habitat.	Same as the Proposed Action.	Same as the Proposed Action.	Existing land uses would be maintained in their current condition, with no enhancements.
Geology and Soils	The addition of impervious surfaces, along with effective stormwater management, will significantly reduce the soil erosion potential resulting from construction activities. A soil erosion and sediment control plan and a blasting plan will also be implemented to further reduce any impacts. Short-term impacts may include flying rock, dust, and venting gases.	Same as the Proposed Action.	Same as the Proposed Action.	No change.
Air Quality	Short-term, temporary road dust will likely result from truck traffic during construction and demolition activities. However, decreased traffic, as the result of a centralized facility, could help to improve air quality.	Same as the Proposed Action.	Same as the Proposed Action.	No change.

Table 6-1
Alternatives Considered
Sheet 2 of 4

RESOURCES	PROPOSED ACTION (SITE #1)	SITE #2	SITE #3	NO ACTION
Surface Water	The amount of runoff from the proposed site is expected to increase as a result of an increase in impervious ground surfaces and roof tops on proposed structures, and removal of vegetation. Impacts will be minimized with proper stormwater management.	Same as the Proposed Action.	Same as the Proposed Action.	No change.
Wetlands	No wetland areas are located on the proposed site.	Same as the Proposed Action.	Same as the Proposed Action.	No change.
Floodplains	All proposed activities will occur outside the 100-year floodplain, as delineated by the USACE.	Same as the Proposed Action.	Same as the Proposed Action.	No change.
Bio/Ecosystems	Removal of trees and vegetation will occur only where necessary, and impacts are expected to be minor. Affected areas will be allowed to naturally revegetate following completion of construction, and replanting of native species will occur throughout the site. Impacts to wildlife species could include disturbance, displacement, and possible mortality of less mobile species. Minor loss of potential summer habitat and possible minor degradation to potential winter habitat of timber rattlesnake.	Same as the Proposed Action.	Same as the Proposed Action.	No change.

Table 6-1
Alternatives Considered
Sheet 3 of 4

RESOURCES	PROPOSED ACTION (SITE #1)	SITE #2	SITE #3	NO ACTION
Historic Resources	There are no sites either listed or eligible for listing on the NRHP that occur within the affected area, therefore no effects are anticipated as a result of this alternative.	None of the existing structures are listed or eligible for listing on the NRHP, therefore historic resources would not be affected by this alternative.	None of the existing structures are listed or eligible for listing on the NRHP, therefore historic resources would not be affected by this alternative.	No change.
Noise	Minimal, short-term impacts are expected as a result of noise generated from construction related equipment. It is expected that noise generated from traffic will be greatly reduced, benefiting noise levels over the long-term.	Same as the Proposed Action.	Same as the Proposed Action.	No change.
Transportation	The presence of construction equipment and construction workers' vehicles will have minimal, short-term impacts on traffic during early morning and late afternoon hours. Once the project is complete, roadways in and around the installation will likely see a decrease in the amount of vehicular traffic, resulting in a long-term benefit to transportation.	Same as the Proposed Action.	Same as the Proposed Action.	No change.

Table 6-1
Alternatives Considered
Sheet 4 of 4

RESOURCES	PROPOSED ACTION (SITE #1)	SITE #2	SITE #3	NO ACTION
Planting and Landscaping	Preservation techniques will be implemented for existing trees that are to be saved. Any impacts that revegetation might introduce will be minimized by using various native species.	Same as the Proposed Action.	Same as the Proposed Action.	No change.
Socioeconomics	The spending of project personnel at area businesses will provide short-term benefits to the economy. In the long-term, it is not expected that employment and community service needs (*i.e.*, police and fire) associated with the new facility will differ from existing levels.	Same as the Proposed Action.	Same as the Proposed Action.	No change.

Table 6-2
Effects of the Picatinny Arsenal Explosives Facility on Resources of Principal National Recognition

TYPES OF RESOURCES	PRINCIPAL SOURCES OF NATIONAL RECOGNITION	MEASUREMENTS OF EFFECTS
Air Quality	Clean Air Act, as amended (42 USC 1857 h-7 et. seq.)	No change in air quality classifications
Endangered & Threatened Species/Critical Habitat	Endangered Species Act of 1973, as amended (16 USC Sec. 1531 et. seq.)	Minor decrease in potential summer roosting habitat for Indiana bats
		Minor decrease in moderate to low timber rattlesnake potential summer habitat
		Minor degradation to timber rattlesnake potential winter den habitat.
Fish and Wildlife Habitat	Fish and Wildlife Coordination Act (16 USC Sec. 661 et. seq.)	Removal of woody vegetation may impact less mobile species depending on schedule
Floodplains	Executive Order 11988, Floodplain Management	No floodplain areas gained or lost
Historic & Cultural Properties	National Historic Preservation Act of 1966, as amended (16 USC Sec. 470 et. seq.)	No National Register eligible or listed properties affected
Water Quality	Clean Water Act (33 USC 1251 et. seq.)	No change in state water quality classifications; stormwater management system to be employed
Wetlands	Executive Order 11990, Protection of Wetlands	No wetlands lost or gained.

7.0 LISTING OF PERSONS AND ORGANIZATIONS CONSULTED

Persons and Organizations Consulted. The following agencies, organizations, and personnel were consulted during the preparation of this environmental assessment:

Mr. Gary Chen, General Engineer, TACOM-ARDEC

Mr. Jon Van De Venter, Natural Resource Manager, TACOM-ARDEC

Ms. Dorothy Guzzo, New Jersey Historic Preservation Office

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New Jersey Department of Environmental Protection, Land Use Regulation Program

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ATTACHMENT E

DDESB-KT

MEMORANDUM FOR ALTERNATE ARMY BOARD MEMBER, Mr. JAMES C. KING
NAVY BOARD MEMBER, CAPTAIN MARK HELMKAMP
AIR FORCE BOARD MEMBER, COLONEL DANIEL TOMPKINS
MARINE CORPS BOARD MEMBER, MR. JERRY MAZZA

SUBJECT: Corrected Updated Guidance on 12-inch Thick Substantial Dividing Walls

References: (a) DDESB-KT Memorandum of 18 October 2002

(b) DDESB-KT Memorandum of 14 May 2001, Subject: Guidance on 12-inch Thick Substantial Dividing Walls

(c) Technical Manual (TM)-5-1300, Naval Facilities Engineering Command (NAVFAC) P-397, Air Force Manual (AFM) 88-22, "Structures to Resist the Effects of Accidental Explosions," 28 November 1990

(d) NFESC TR-2112-SHR, "HPM Non-Propagation Wall Design Criteria", June 2002

1. Reference (a), which provided updated guidance to reference (b), was inadvertently issued with an omission. Specifically, it did not incorporate technical information derived from Air Force-sponsored substantial dividing walls (SDW) testing performed by the Naval Facilities Engineering Service Center (NFESC). Consequently, reference (a) is rescinded and replaced by this memorandum. The significant changes made to reference (a) by this memorandum are described below:

a. Paragraph 4.f below was revised to incorporate SDW support requirements resulting from the above-mentioned Air Force-sponsored testing.

b. This memorandum revises the previous approach of specifying Hazard Divisions (HD) in the SDW guidance memorandum and instead directs users to Chapter 9 of DoD 6055.9-STD for determining whether ammunition and explosives (AE) materials can be expected to detonate (partially or in full) or burn. Paragraph 3 below provides additional information regarding this item.

2. Reference (b) provided the initial guidance regarding the application of and criteria for 12-inch thick SDW. Since this initial guidance was issued, NFESC has completed additional explosives testing and analyses, which has increased our knowledge of SDW protection capabilities. The results of those tests and analyses have shown a need to further clarify and define SDW criteria. In addition, additional administrative controls are needed to insure the

application of SDW criteria only to those situations that have been validated either through testing or analyses.

3. This memorandum provides updated guidance regarding the application of and criteria for 12-inch thick SDW to prevent prompt detonation reactions or propagation of burning reactions (involving AE) between adjacent bays and to provide personnel protection from remotely controlled operations. Paragraph C9.2.1 of DoD 6055.9-STD provides criteria to be used for determining the quantity of explosives present and how the various HD are to be treated when by themselves or in mixtures with other HD. Detonation (either mass (hereafter called full) or non-mass (hereafter called partial)) reactions are considered to occur with HD 1.1, HD 1.2, HD 1.5, and HD 1.6 materials and with AE mixtures that result in one of those HD designations. Burning reactions are considered to occur with HD 1.3 by itself or when co-located with 1.6.

4. Definition of a 12-inch thick SDW. A 12-inch thick SDW is a reinforced concrete wall having the following characteristics (Note: As previously stated in reference (b), existing 12-inch thick reinforced concrete walls constructed for explosives operations, explosives storage, or remotely controlled explosives operations at Department of Defense (DoD) facilities are considered adequate for use as SDW):

a. A minimum thickness of 12 inches.

b. A minimum steel reinforcing bar size of 1/2-inch diameter (#4).

c. The steel reinforcing bars are spaced not more than 12 inches on center horizontally and vertically, on both faces of the wall, with bars on one face staggered with the bars on the opposite face.

d. The concrete cover over the steel reinforcing bars is approximately two inches thick.

e. The concrete has a minimum compressive strength of 2,500 pounds per square inch (psi).

f. The SDW main steel is continuous into supports as follows:

(1) If the SDW is used for prevention of either prompt detonation or propagation of burning reactions, it must, at a minimum, be adequately supported at the floor.

(2) If the SDW is used for personnel protection, from either detonation or burning reactions, for remote-controlled operations, it must, at a minimum, be supported on at least two sides (e.g., the SDW is supported at the floor and at least one 12-inch thick adjacent SDW.)

g. When SDW described in paragraph 4.(a - f) above are incorporated into a room or cubicle, additional structural considerations must be addressed in order to limit internal pressure build-up within the room or cubicle and assure the capability of the SDW to provide prompt propagation protection to munitions in adjacent rooms or cubicles. For this reason, the following additional criteria apply to a room or cubicle incorporating SDW:

(1) A minimum of two surfaces (wall or roof) of the room or cubicle must be open or frangible. A surface is considered frangible if its unit weight $\leq$ 10 lbs/ft^2. If a roof is treated as one of a frangible surface, then any potential additional dead load, snow load, or ice load must be considered when calculating the roof's unit weight.

(2) A minimum scaled vent area ($A_V/V^{2/3}$) of 1.85 will be provided; where A_V = total area of frangible and open surfaces (ft^2) and V = volume of room (ft^3).

(3) When used as a firewall for prevention of propagation of burning reactions, the SDW must be continuous from the floor to the roofline to mitigate thermal effects unless otherwise required by local fire codes to extend above the roof.

(4) Those rooms or cubicles containing only materials that are expected to exhibit burning reactions will have adequate venting area; that is, a frangible wall or roof (see paragraph 4.g(1) above as to what constitutes frangible.)

5. Application and use of SDW for prevention of prompt detonation or propagation of burning reactions. The following conditions apply to the use of SDW for the prevention of prompt detonation or propagation of burning reactions. When these conditions are not met, individual net explosive weights (NEW) of each room or cubicles will be summed together and quantity-distance will be based on the summed NEW. Paragraph 3 above explains how to determine the reaction (detonation or burning) type and AE quantity expected in an event. (Note: See the Joint Hazard Classification System listing for the Sensitivity Groups (SG) associated with HD 1.1 and HD 1.2.1 items. Additional SG information is provided in the attached table.)

a. To prevent a prompt detonation reaction in any acceptor room or cubicle separated by an SDW from adjacent donor rooms or cubicles, each adjacent donor room or cubicle containing material that will detonate is limited to a maximum of 425 pounds NEW or to a loading density (NEW/room volume (ft^3)) of < 0.20 pounds/ft^3, whichever is attained first. For HD 1.1 and HD 1.2.1 located in acceptor rooms or cubicles, storage is limited to SG 1, 2, 3 and 4 AE only. AE will be placed no closer than 3 feet from the nearest wall.

b. To prevent a prompt detonation reaction involving SG 5 in an acceptor room or cubicle separated by an SDW from adjacent donor rooms or cubicles, each adjacent donor room or cubicle containing material that will detonate is limited to a maximum of 20 pounds NEW, or to a loading density (NEW/room volume (ft^3)) of < 0.01 pounds/ft^3, whichever is attained first. AE will be placed no closer than 3 feet from the nearest wall.

c. To prevent propagation of a burning reaction (i.e., HD 1.3) between adjacent rooms or cubicles separated by an SDW, the NEW in each room or cubicle is limited to 5,000 pounds of packaged materials or 300 pounds for unpackaged materials.

6. Application and use of SDW for personnel protection for remotely controlled operations. The following apply to the use of SDW for personnel protection (commonly called K24 protection) during remotely controlled operations:

a. Personnel will be separated from operations involving materials that will detonate either by the shorter K24 separation distance when measured over or around the 12-inch thick SDW or by the shortest distance that provides 2.3 psi level of protection to personnel.

b. Personnel will be separated from operations involving only material where a burning reaction is expected by the shorter K8 separation distance when measured over or around the SDW or by the shortest distance that limits the thermal flux to personnel to 0.3 calories/cm^2/sec.

c. Personnel will be protected from fragments and debris having energies of 58-foot-pounds or greater (hazardous fragments). A 12-inch thick SDW that is properly supported on two sides (such as a reinforced concrete floor and another 12-inch thick SDW) will provide such personnel protection from a maximum credible event (MCE) involving up to 300 pounds of AE expected to burn or up to 8 pounds of AE expected to detonate.

7. If any of the SDW criteria discussed above cannot be met, then the wall/room design and explosives scenario will be separately analyzed using references (c) and (d) to determine if equivalent protection is provided by the available wall/room arrangement (e.g., a four wall cubicle, an alternate reinforced concrete wall design, a larger room, a greater standoff, or a smaller quantity of SG 5). Department of Defense Explosives Safety Board (DDESB) approval of any such analysis is required.

8. The intraline distance (ILD) level of protection issue is not addressed by this guidance. The requirement remains K18 or ILD, as specified in the appropriate tables of DoD 6055.9-STD, for the HD in question. Presently, there is no consideration that a 12-inch thick SDW or any type of wall provides an equivalent ILD level of protection. However, if an SDW is determined to provide K24 personnel protection, then by default, it can be assumed that K18 protection is also provided by that SDW.

9. My point of contact on this matter is Eric Deschambault, DSN: 221-1369, commercial phone: (703)-325-1369; fax: (703)-325-6227; e-mail: Eric.Deschambault@ddesb.osd.mil.

WILLIAM E. WRIGHT
Captain, US Navy
Chairman

Attachment
as stated

cc:
Alternate Navy Board Member, Captain Robert M. Honey
Alternate Air Force Board Member, Mr. Eric Olson
Alternate Marine Corp Board Member, Mr. Thierry Chiapello
JCS (J-4-SMPD)
DTRA (Cdr. Gatski)
DCMA (DCMA-O)
TRANSCOM (TCJ4-LT)
DA, Director of Safety (Mr. J. Gibson)
USADAC/SOSAC-ES (Mr. Johnnie Cook)
NOSSA/N7D (Mr. Richard T. Adams)
HQ, USACE (Mr. Joseph P. Hartman)

Ordnance Groups and Critical Acceptors.

Sensitivity Groups #	Sensitivity Groups Description	Compatibility Group (CG)	Ordnance Description	Critical Acceptor Ordnance
1	**Robust**	C, D, E	Bombs, Projectiles, Thick-Case Munitions	**MK82, MK83, MK84 Bombs** **M107-155mm Projectile** WALLEYE[1]
		J	Ammunition with both Explosives & Flammable Liquids	HARPOON TOMAHAWK
2	**Non-Robust**	D, E	Thin-Case Items: Most Missiles, Rockets Underwater Mines & Torpedoes	**MK103/ MK10 Torpedo Warheads** **MK55 Underwater Mine**
3	**Fragmenting**	D, E	Fragmenting Missile Warheads	WAU17 Sparrow Warhead
4	**Cluster Bombs/ Dispenser Munitions**	D, E	Cluster Bombs, Dispenser Munitions	M483 Bomblet, **M864 Proj** Gator Bomblet
		J	Ammunition with both Explosives & Flammable Liquids	TOMAHAWK
5	**SD Sensitive**	B	Detonators and Initiating Devices	#8 Blasting Cap
		F, G	Fireworks, Incendiary, Illuminating, Smoke or Tear Producing Munitions; Ammunition with Initiation Devices	M106 Grenade M61 Grenade
		C, D, E	Demolition Explosives, Very Thin-case items; Sheet Explosives, Sensitive Non-Robust	M118 PETN & Mk36 H6 Demo Blocks **TOWII** / HELLFIRE[1]

[1] Directed Energy Weapon. Stowage plan must orient directed energy jet away from NPW.

ATTACHMENT F

NOT USED

ATTACHMENT G

NOT USED

ATTACHMENT H

NOT USED

ATTACHMENT I

NOT USED

ATTACHMENT J

WASTE PROFILE DOCUMENT

Waste Profile Document #: _B 0230-0-000-A_____

Office Symbol: _AMSRD-AAR-AEE-W_____

POC: _G.Rector , J. Christanio_____ Phone # 6731 or 6726

Process Description (That Generates this Waste): _Melt Casting, Formulation
Melting explosives, Such as COMP B, PAX-21, TNT, Tritnol, PAX/AFX 196, PAX-28, PAX-41, Octol 70/30

Description of the Waste:

Liquid _X__ or Solid _X___

Multi Layered? __No_____ (yes / no)

Flash Point: _300 deg. F_____ (in degrees F)

pH: _____

Oxidizer? ___NO_____ (yes / no)

Reactive (Is there the realistic potential to explode or react violently?) ____No____ (yes / no)

Does the waste contain: (yes / no)

Arsenic	__no__	Benzene	_no__	Hexachlorobenzene	_no__
Barium	_no___	Carbon Tetrachloride	_no__	Hexachlorobutadiene	-no
Cadmium	_no__	Chlordane	_no__	Hexachloroethane	no
Chromium	_no__	Chlorobenzene	_no__	Lindane	no
Lead	_no___	Chloroform	_no__	Methoxychlor	no
Mercury	_no___	o, m, p – Cresol	_no__	Methyl Ethyl Ketone	no
Selenium	_no___	Cresol	_no__	Nitrobenzene	no
Silver	__no___	2,4-D	__no_	Pentachlorophenol	no
		1,4 Dichlorobenzene	_no__	Pyridine	_no__
		1,2 Dichloroethylene	_no__	Tetrachloroethylene	_no__
		1,1 Dichloroethylene	_no__	Toxaphene	_no__
		2,4 Dinitrotoluene	_no__	Trichloroethylene	_no__
		Endrin	_no__	2,4,5-Trichlorophenol	_no_
		Heptachlor	_no__	2,4,6-Trichlorophenol	_no_
				2,4,5-TP (Silvex)	_no__
				Vinyl Chloride	_no__

Constituents / Ingredients: (list each ingredient)

Chemical Name:	% Range by weight
TNT	10% TNT, 2% rag and 88% water
COMP B	10% Comp B, 2% rag and 88 % water
PAX/AFX 196	10% PAX/AFX 196, 2% rag and 88% water
PAX-21	10% PAX-21, 2% rag and 88% water
PAX-28	10% PAX-28, 2% rag and 88% water
PAX-41	10% PAX-41, 2% rag and 88% water
Octol	10% Octol, 2% rag and 88% water
Tritonol	10% Tritonol, 2% rag and 88% water
Inert Mix (Wax, Gypsum, Rosin)	1% Inert Mix, 99% water
RDX and HMX	1% RDX and HMX and 99% water
_____	_____
_____	_____

Disposal / Labeling Information: *(to be completed by Environmental Office)*

DOT Shipping Name: _____

Additional Description: _____

DOT Class: _____

DOT ID#: _____

DOT Packing Group: _____

EPA Waste Codes: _____

UHC's: _____

ATTACHMENT K

NOT USED

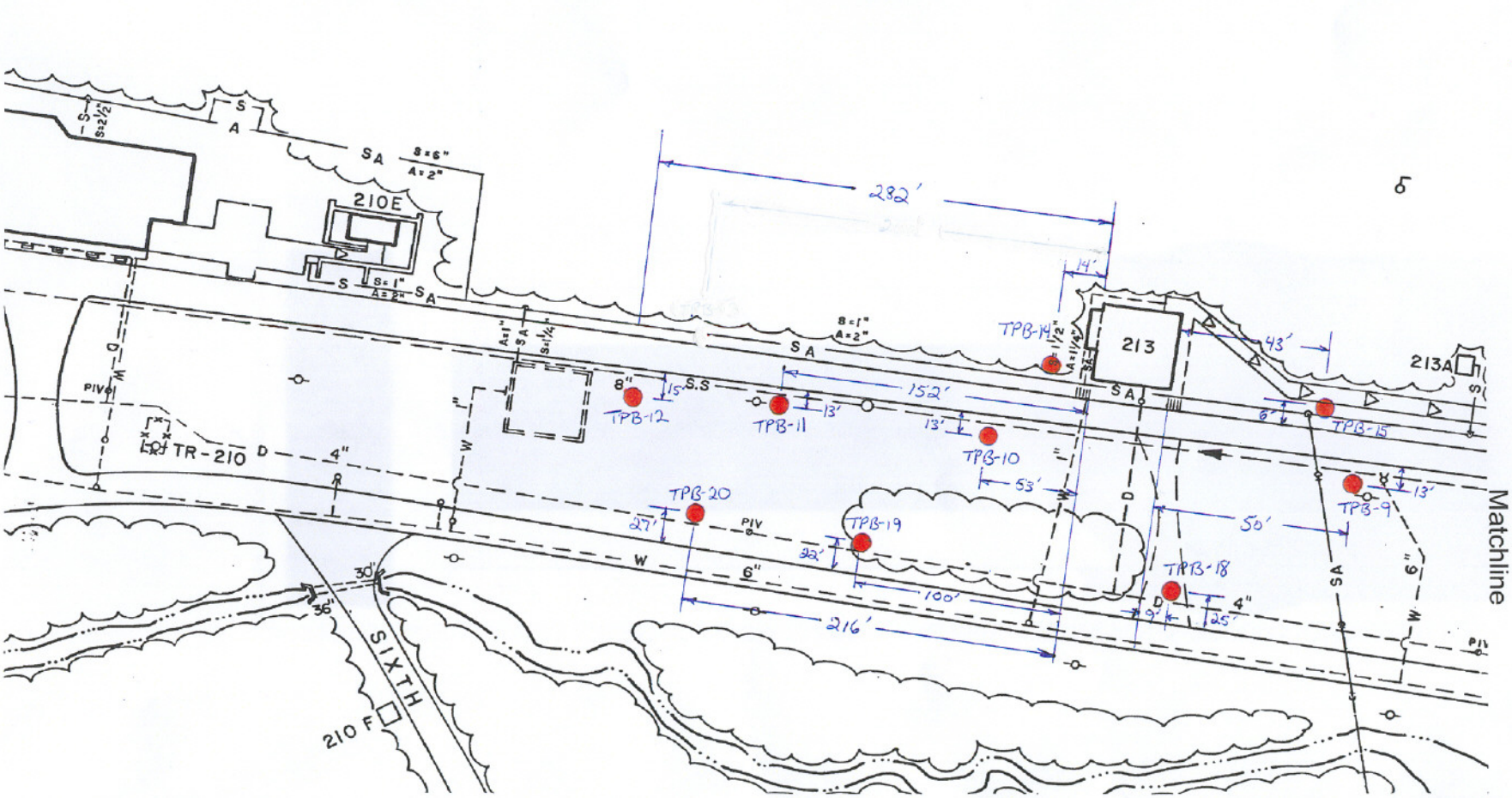
ATTACHMENT L

SUPPLEMENTAL TEST PIT PROGRAM
EXPLOSIVES R&D FACILITY
PICATINNY ARSENAL
DOVER, NJ

The supplemental test pit program consisted of the performance of 11 test pits. The locations of the test pits are shown in Figure No. 1 and 2. It should be noted that test pit TP-B13 was not performed due to the proximity of the test pit to the steam line located along Phipps Road.

The test pits were performed on May 3 and May 4, 2004 by a subcontractor hired by Jersey Boring and Drilling, Inc. of newark, NJ. The test pits were inspected on a full time basis by Mr. Chang Oh of URS Corporation. The test pit depths ranged from 5 ft to 10 ft and were performed using a CAT 426 Backhoe. The test boring logs and representative photographs are included.

The subsurface conditions at the test pits generally consist of coarse to fine sand with various amounts of boulders, cobbles, gravel, and silt. Based on visual observations, the percentage of boulders and cobbles within the excavated material was estimated to be approximately 20 to 70%.



LEGEND

● TPB-9 — TEST PIT IDENTIFICATION AND LOCATION

NOTES

1. TEST PIT LOCATIONS ARE NOT SURVEYED. LOCATIONS SHOULD BE CONSIDERED AS APPROXIMATE.
2. BASE MAP OBTAINED FROM UNDATED DRAWING ENTITLED "MASTER PLAN - DETAIL PLATS."

Test Pit Location Plan - 1 Explosive R&D Loading Facility Picatinny Arsenal, NJ			
URS WAYNE, NEW JERSEY			
DR BY: TGT	SCALE: Not to Scale	PROJ NO: 11655665	
	DATE: 5/13/2004	FIG NO: 1	

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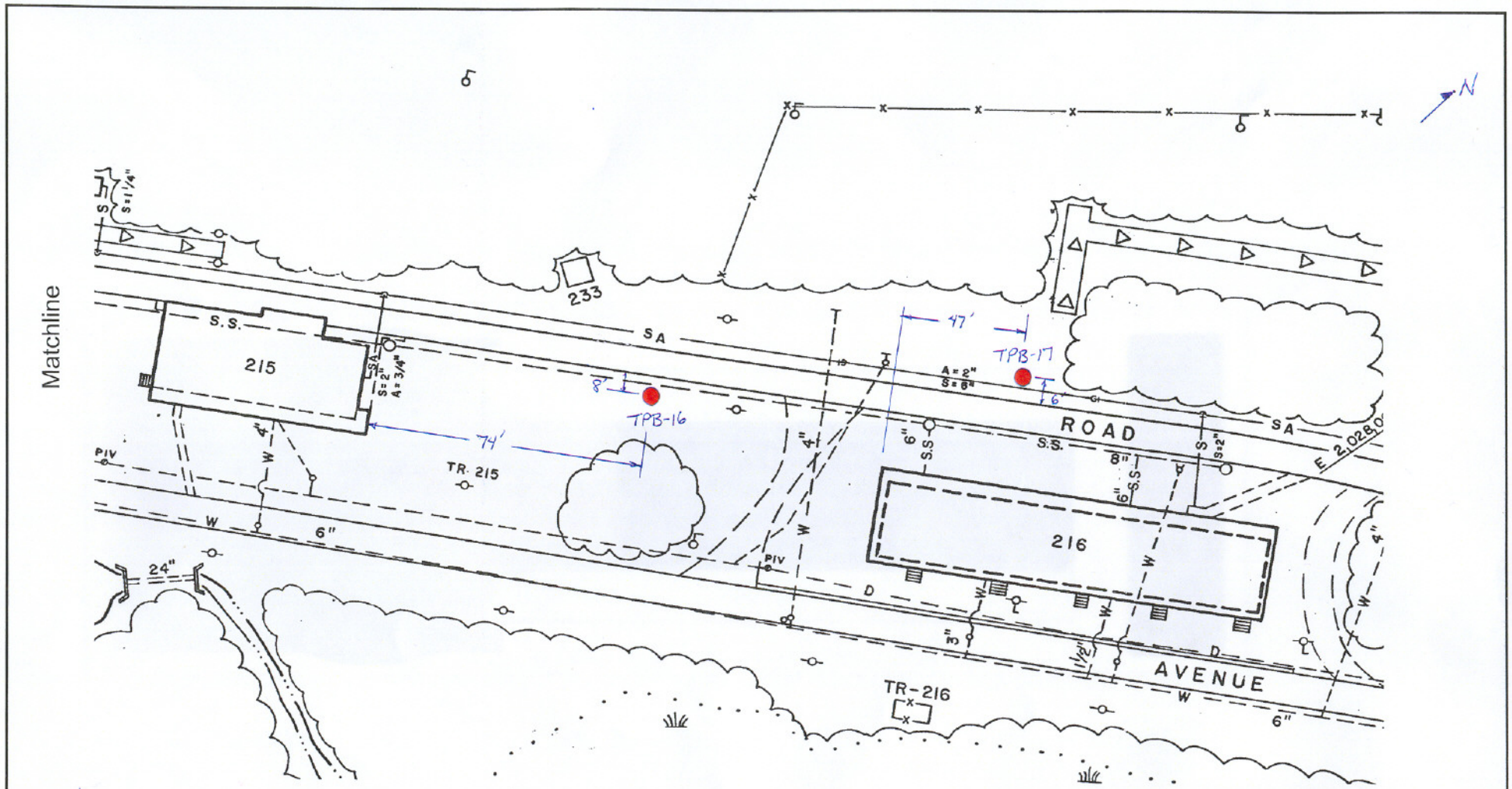


LEGEND

TPB-16 — TEST PIT IDENTIFICATION AND LOCATION

NOTES

1. TEST PIT LOCATIONS ARE NOT SURVEYED. LOCATIONS SHOULD BE CONSIDERED AS APPROXIMATE.
2. BASE MAP OBTAINED FRM UNDATED DRAWING ENTITLED "MASTER PLAN - DETAIL PLATS."

Test Pit Location Plan - 2 Explosive R&D Loading Facility Picatinny Arsenal, NJ			
URS WAYNE, NEW JERSEY			
DR BY: TGT	SCALE: Not to Scale	PROJ NO: 11655665	
	DATE: 5/13/2004	FIG NO: 2	

I:\Projects\11655665(Picatinny)\Report\testpitlocationplan-2.XLS

URS

LOG OF TEST PIT TPB-9

PROJECT NAME Explosive R&D Loading Facility LOCATION Picatinny Arsenal, Dover, NJ		GROUND ELEVATION (FT)	COMPLETION DEPTH 10 ft.	PROJECT NUMBER 11655665
EXCAVATION CONTRACTOR Mike Fitzpatrick & Sons	FOREMAN Mike Huber	DATE STARTED May 03, 2004	DATE COMPLETED May 03, 2004	APPROX. DIMENSIONS (FT) L x W x D 8 ft. x 3 ft. x 10 ft.
EXCAVATION EQUIPMENT Caterpiller 426 Backhoe		WATER LEVEL (FT) 9 ft.	INSPECTOR Chang Oh	VIEW
EXCAVATION LOCATION				HORIZONTAL SCALE NTS

Description	Depth (ft)
South Face: 8' 7' 6' 5' 4' 3' 2' 1' 0 West Face: 0 1' 2' 3'	
(SP) Dark brown, coarse to fine SAND with cobbles and boulders, roots Encountered boulders with dimensions of 3 ft. x 1.5 ft. x 1 ft. and 2 ft. x 2 t. x 1 ft. Approximately 40%-50% boulders and cobbles.	0 1' 2' 3'
(SP) Light brown, coarse to fine SAND, some coarse to fine gravel, trace silt. Fine content increased from 6 ft. to below. Water flowing in	4' 5' 6' 7' 8' 9' 10'

URS

LOG OF TEST PIT TPB-10

PROJECT NAME Explosive R&D Loading Facility LOCATION Picatinny Arsenal, Dover, NJ		GROUND ELEVATION (FT) 713 ft. (approx.)	COMPLETION DEPTH 7 ft.	PROJECT NUMBER 11655665
EXCAVATION CONTRACTOR Mike Fitzpatrick & Sons	FOREMAN Mike Huber	DATE STARTED May 03, 2004	DATE COMPLETED May 03, 2004	APPROX. DIMENSIONS (FT) L x W x D 8 ft. x 4 ft. x 7 ft.
EXCAVATION EQUIPMENT Caterpiller 426 Backhoe		WATER LEVEL (FT) 6 ft.	INSPECTOR Chang Oh	VIEW
EXCAVATION LOCATION				HORIZONTAL SCALE NTS

Description	Depth (ft)
BOULDER and COBBLE with brown to dark brown, coarse to fine sand, roots. Approximately 50%-60% boulders and cobbles.	0 – 2'
Dark brown to black, coarse to fine SAND with boulders and cobble Approximately 30%-40% boulders and cobbles. ○ ← Water flowing in	2' – 6'
Orange brown to brown, CLAY.	6' – 7'

8' 7' 6' 5' 4' 3' 2' 1' 0 1' 2' 3' 4' 4.5'

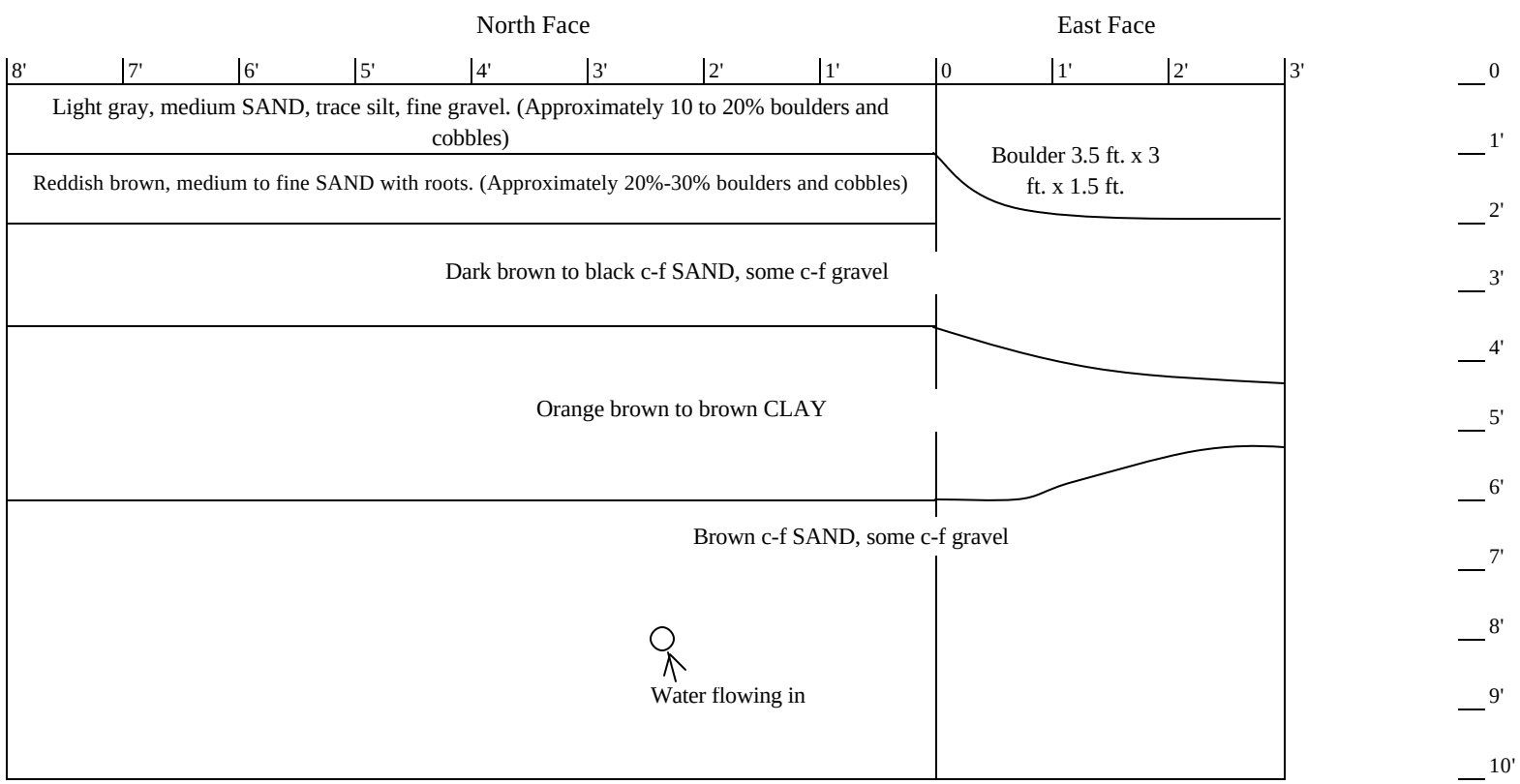
0 1' 2' 3' 4' 5' 6' 7'

URS

LOG OF TEST PIT TPB-11

PROJECT NAME Explosive R&D Loading Facility LOCATION Picatinny Arsenal, Dover, NJ		GROUND ELEVATION (FT) 713 ft. (approx.)	COMPLETION DEPTH 10 ft.	PROJECT NUMBER 11655665
EXCAVATION CONTRACTOR Mike Fitzpatrick & Sons	FOREMAN Mike Huber	DATE STARTED May 03, 2004	DATE COMPLETED May 03, 2004	APPROX. DIMENSIONS (FT) L x W x D 8 ft. x 3 ft. x 10 ft.
EXCAVATION EQUIPMENT Caterpiller 426 Backhoe		WATER LEVEL (FT) 8 ft.	INSPECTOR Chang Oh	VIEW
EXCAVATION LOCATION				HORIZONTAL SCALE NTS

Description	Depth (ft)



URS

LOG OF TEST PIT TPB-12

PROJECT NAME Explosive R&D Loading Facility LOCATION Picatinny Arsenal, Dover, NJ		GROUND ELEVATION (FT)	COMPLETION DEPTH 5 ft.	PROJECT NUMBER 11655665
EXCAVATION CONTRACTOR Mike Fitzpatrick & Sons	FOREMAN Mike Huber	DATE STARTED May 03, 2004	DATE COMPLETED May 03, 2004	APPROX. DIMENSIONS (FT) L x W x D 8 ft. x 4 ft. x 7 ft.
EXCAVATION EQUIPMENT CAT 480D		WATER LEVEL (FT) N/A	INSPECTOR C. Oh	VIEW
EXCAVATION LOCATION				HORIZONTAL SCALE NTS

Description	Depth (ft)

North Face East Face

8' 7' 6' 5' 4' 3' 2' 1' 0 1' 2' 3'

Light brown m-f SAND

Dark brown to black BOULDERS / COBBLES, some c-f sand, c-f gravel. Encountered boulders with dimensions of 3 ft x 2.5 ft x 2 ft and 2 ft x 1.5 ft x 1 ft. Approximately 60 to 70% boulders.

Greenish brown to brown silty CLAY, trace of some f- sand

0 1' 2' 3' 4' 5' 6' 7'

URS

LOG OF TEST PIT TPB-14

PROJECT NAME Explosive R&D Loading Facility LOCATION Picatinny Arsenal, Dover, NJ		GROUND ELEVATION (FT)	COMPLETION DEPTH 8 ft	PROJECT NUMBER 11655665
EXCAVATION CONTRACTOR Mike Fitzpatrick & Sons	FOREMAN Mike Huber	DATE STARTED May 03, 2004	DATE COMPLETED May 03, 2004	APPROX. DIMENSIONS (FT) L x W x D 10 ft. x 4.5 ft. x 8 ft.
EXCAVATION EQUIPMENT Caterpiller 426 Backhoe		WATER LEVEL (FT) NA	INSPECTOR Chang Oh	VIEW
EXCAVATION LOCATION				HORIZONTAL SCALE NTS

Description	Depth (ft)

South Face: 8' 7' 6' 5' 4' 3' 2' 1'

West Face: 0 1' 2' 3'

Light Brown to Brown m-f SAND , some c-f gravel

Brown c-f SAND, some c-f gravel. Approximately 30-40 % of boulders and cobbles.

Reddish Brown to Brown CLAY

0 1' 2' 3' 4' 5' 6' 7' 8'

NOTE: Very hard boulder encountered around 2 - 4'

LOG OF TEST PIT TPB- 15

PROJECT NAME Explosive R&D Loading Facility LOCATION Picatinny Arsenal, Dover, NJ		GROUND ELEVATION (FT)	COMPLETION DEPTH 7.5 ft	PROJECT NUMBER 11655665
EXCAVATION CONTRACTOR Mike Fitzpatrick & Sons	FOREMAN Mike Huber	DATE STARTED May 03, 2004	DATE COMPLETED May 03, 2004	APPROX. DIMENSIONS (FT) L x W x D 10 ft. x 4.5 ft. x 7.5 ft.
EXCAVATION EQUIPMENT Caterpiller 426 Backhoe		WATER LEVEL (FT) NA	INSPECTOR Chang Oh	VIEW
EXCAVATION LOCATION				HORIZONTAL SCALE NTS

Description	Depth (ft)

East Face — South Face

3' 2' 1' 0 1' 2' 3' 4' 5' 6' 7' 8'

Black to dark gray c-f SAND, trace of some c-f gravel, little cobbles, roots (Approx. 30 to 40%)

Brown to reddish brown silty CLAY, trace of f. sand, (Approximately 10-20 %)

Reddish brown to brown CLAY

0 1' 2' 3' 4' 5' 6' 7' 8'

NOTE: About 4 feet depth : Hard operation around 1/3 of boulder

10" of concrete pavement observed.

URS

LOG OF TEST PIT TPB-16

PROJECT NAME Explosive R&D Loading Facility LOCATION Picatinny Arsenal, Dover, NJ		GROUND ELEVATION (FT)	COMPLETION DEPTH 8.5 ft	PROJECT NUMBER 11655665
EXCAVATION CONTRACTOR Mike Fitzpatrick & Sons	FOREMAN Mike Huber	DATE STARTED May 03, 2004	DATE COMPLETED May 03, 2004	APPROX. DIMENSIONS (FT) L x W x D 9.5 ft. x 4 ft. x 8.5 ft.
EXCAVATION EQUIPMENT Caterpiller 426 Backhoe		WATER LEVEL (FT) 7'	INSPECTOR Chang Oh	
EXCAVATION LOCATION				HORIZONTAL SCALE NTS

Description	Depth (ft)
East Face: 8' 7' 6' 5' 4' 3' 2' 1' South Face: 0 1' 2' 3' Gray to dark brown m-f SAND, trace of some c-f gravel, some cobbles and and boulders	0 1' 2'
Light brown to brown c-f SAND, some clay, trace of c-f gravel with boulders and cobbles, encountered 3 ft x 2.5 ft x 2 ft size boulder. Approximately 30- 40 % boulders.	3' 4' 5' 6'
water flowing in at 7 ft. Brown to Reddish Brown silty CLAY, more of f. sand	7' 8'

URS

LOG OF TEST PIT TPB-17

PROJECT NAME Explosive R&D Loading Facility LOCATION Picatinny Arsenal, Dover, NJ		GROUND ELEVATION (FT)	COMPLETION DEPTH 6 ft	PROJECT NUMBER 11655665
EXCAVATION CONTRACTOR Mike Fitzpatrick & Sons	FOREMAN Mike Huber	DATE STARTED May 03, 2004	DATE COMPLETED May 03, 2004	APPROX. DIMENSIONS (FT) L x W x D 10 ft. x 4 ft. x 6 ft.
EXCAVATION EQUIPMENT Caterpiller 426 Backhoe		WATER LEVEL (FT) NA	INSPECTOR Chang Oh	
EXCAVATION LOCATION				HORIZONTAL SCALE NTS

Description	Depth (ft)
North Face: 8' 7' 6' 5' 4' 3' 2' 1' East Face: 0 1' 2' 3' Black c-f GRAVEL, some c-f sand, with cobbles and and boulders (Approx. 50 to 60%), encountered 4' x 3x 1.5' of boulder	0 1' 2' 3'
Orange brown to brown silty c-f SAND , some clay, cobbles (Approx 30- 40%)	4' 5' 6' 7' 8'

URS

LOG OF TEST PIT TPB-18

PROJECT NAME Explosive R&D Loading Facility LOCATION Picatinny Arsenal, Dover, NJ		GROUND ELEVATION (FT)	COMPLETION DEPTH 6 ft	PROJECT NUMBER 11655665
EXCAVATION CONTRACTOR Mike Fitzpatrick & Sons	FOREMAN Mike Huber	DATE STARTED May 04, 2004	DATE COMPLETED May 04, 2004	APPROX. DIMENSIONS (FT) L x W x D 7 ft. x 3 ft. x 6 ft.
EXCAVATION EQUIPMENT Caterpiller 426 Backhoe		WATER LEVEL (FT) 4.5'	INSPECTOR Chang Oh	
EXCAVATION LOCATION				HORIZONTAL SCALE NTS

Description	Depth (ft)
North Face (7') 8' 7' 6' 5' 4' 3' 2' 1' / East Face (3') 0 1' 2' 3'	0
Brown c-f SAND, some c-f Gravel with cobbles and boulders, trace of some silt (Around 30% boulders and cobbles)	1' 2' 3' 4'
Black to dark gray SILT, trace to some clay Water flowing in from 4.5 '	5'
Dark brown to brown CLAY	6' 7' 8'

URS

LOG OF TEST PIT TPB-19

PROJECT NAME Explosive R&D Loading Facility LOCATION Picatinny Arsenal, Dover, NJ		GROUND ELEVATION (FT)	COMPLETION DEPTH 6 ft	PROJECT NUMBER 11655665
EXCAVATION CONTRACTOR Mike Fitzpatrick & Sons	FOREMAN Mike Huber	DATE STARTED May 05, 2004	DATE COMPLETED May 05, 2004	APPROX. DIMENSIONS (FT) L x W x D 9ft. x 3.5 ft. x 6.0 ft.
EXCAVATION EQUIPMENT Caterpiller 426 Backhoe		WATER LEVEL (FT) 4'	INSPECTOR Chang Oh	
EXCAVATION LOCATION				HORIZONTAL SCALE NTS

Description	Depth (ft)
Top Soil and Roots	0 – 1'
Brown c-f SAND, some c-f gravel,trace of silt, with boulders (2.5' x 2.5' x 1.5'). Approximately 20 to 30 % boulders	1' – 4'
Mostly BOULDERS and COBBLES and a little brown to gray silt. Approximately 50 to 60 % boulders Water flowing in	4' – 8'

West Face North Face

3' 2' 1' 0 1' 2' 3' 4' 5' 6' 7' 8'

0 1' 2' 3' 4' 5' 6' 7' 8'

URS

LOG OF TEST PIT TP-B20

PROJECT NAME: Explosive R&D Loading Facility LOCATION: Picatinny Arsenal, Dover, NJ		GROUND ELEVATION (FT)	COMPLETION DEPTH 6 ft	PROJECT NUMBER 11655665
EXCAVATION CONTRACTOR Mike Fitzpatrick & Sons	FOREMAN Mike Huber	DATE STARTED May 05, 2004	DATE COMPLETED May 05, 2004	APPROX. DIMENSIONS (FT) L x W x D 9ft. x 3.5 ft. x 6.0 ft.
EXCAVATION EQUIPMENT Caterpiller 426 Backhoe		WATER LEVEL (FT) 4'	INSPECTOR Chang Oh	
EXCAVATION LOCATION				HORIZONTAL SCALE NTS

Description	Depth (ft)

North Face: 8' 7' 6' 5' 4' 3' 2' 1'

East Face: 0 1' 2' 3'

Mostly BOULDER and CONCRETE, with brick rubble, some black to dark gray c-f sand, some silt c-f gravel, Approimately 60% of boulders and cobbles

Water flowing in

Greenish brown to gray CLAY

0, 1', 2', 3', 4', 5', 6', 7', 8'

Test Pit TPB-9

Test Pit TPB-9

Test Pit TPB-9

Test Pit TPB-9

Test Pit TPB-10

Test Pit TPB-10

Test Pit TPB-10

Test Pit TPB-10

Test Pit TPB-11

Test Pit TPB-11

Test Pit TPB-11

Test Pit TPB-11

Test Pit TPB-12

Test Pit TPB-12

Test Pit TPB-12

Test Pit TPB-14

Test Pit TPB-14

Test Pit TPB-14

Test Pit TPB-15

Test Pit TPB-15

Test Pit TPB-15

Test Pit TPB-16

Test Pit TPB-16

Test Pit TPB-16

Test Pit TPB-16

Test Pit TPB-17

Test Pit TPB-17

Test Pit TPB-17

Test Pit TPB-18

Test Pit TPB-18

Test Pit TPB-18

Test Pit TPB-19

Test Pit TPB-19

Test Pit TPB-19

Test Pit TPB-19

Test Pit TPB-20

Test Pit TPB-20

Test Pit TPB-20

ATTACHMENT M

Standing Operating Procedure

For

Soil Management Procedures during Construction Activities

Picatinny Arsenal

Prepared: July 2003

Revised:

Prepared by:

Johnson Controls, Inc.
Risk Management Group
Environmental Office

Table of Contents

Section	Page
1.0 Concurrences and Sign-off	3
2.0 Site Construction Managers Statement	4
3.0 Purpose	5
3.1 Definitions	5
3.2 Applicable Documents	6
4.0 General Procedures for All Soil Disturbance Activities	6
4.1 Environmental Work Request Requirements	7
4.1.1 Site Evaluation Sampling Requirements	7
5.0 Site Investigation Sampling And Analysis	8
5.1 Investigation of Buildings Requiring TECUP Procedure	9
6.0 Construction Planning/Site Excavation	9
6.1 Soil Excavation Requirements	9
6.1.1 Soil Excavation and Management of Excess Soil	10
6.2 Management of Visually Contaminated Soil	11
6.3 Management of Soil/Excess Soil Not Visually Contaminated	11
7.0 Erosion Control	12
7.1 Erosion Control Measures Prior to Excavation	12
7.2 Erosion Control Measures During Excavation	13
7.3 Post Construction/Excavation Erosion Controls	13
8.0 Soil Storage Management	13
8.1 “Clean” Soil Storage Management	14
8.2 “Contaminated” Soil Storage Management	14
9.0 Soil Re-Use Considerations	15

ATTACHMENTS

Attachment 1. Soil Management Checklist & Flow Diagram
Attachment 2. Environmental Affairs Program Requirements Checklist
Attachment 3. Environmental Work Request for Site Clearance/Soil Management
Attachment 4. Soil Management Report
Attachment 5. Potentially Contaminated Soil Management Manifest and Record
Attachment 6. Picatinny Arsenal Excess Soil Manifest and Record Document

Date: July 31, 2003
SOP No. XXXXXXX
Office Symbol: XX
SOP No.: XXXXXXX

Section 1

Armament Research, Development and Engineering Center

Standing Operating Procedures For:
Soil Management Procedures During Construction Activities

PREPARED BY: _____DATE:_____
Johnson Controls, Inc. Risk Management Group

SUBMITTED BY: _____DATE:_____

CONCURRED BY: _____DATE:_____
Ted Gabel, IRP Program Manager

APPROVED BY: _____DATE:_____
Thomas Solecki, Chief Environmental Affairs Office

Section 2

SITE CONSTRUCTION MANAGER'S STATEMENT

I have read or have read to me the Guidelines established in this SOP. I certify to the best of my ability that the operation as described within this SOP can be conducted in a safe, healthy and environmentally sound manner. I have ensured that all operators are trained and are familiar with the requirements of this SOP and of the operation/activity. I agree to review the SOP every three months during continuing operations and at the renewal period of two years later. If deviations/alterations to the SOP are required, I will ensure that the operation is discontinued until the revised SOP is staffed for approval. Furthermore, if unexpected safety, health or environmental hazards are identified, I will ensure that the operation is discontinued until the hazard has been eliminated.

Name of Construction Manager, Title Date

_____ _____

3.0 Purpose

This Standing Operating Procedure (SOP) summarizes the general soil management and environmental protection considerations that must be addressed when soils at Picatinny Arsenal are disturbed during construction activities.

Picatinny Arsenal is currently listed by the U.S. Environmental Protection Agency (USEPA) as a National Priority List (NPL) site and is Federally mandated to address soil and groundwater contamination at the installation. Many areas of the installation have been investigated and contain levels of contamination exceeding regulatory action levels. If excavated or disturbed soils contain a sufficient concentration of hazardous contaminants that results in classification as a industrial or hazardous waste, then those soils must be properly treated or disposed of in accordance with USEPA and New Jersey Department of Environmental Protection (NJDEP) regulations.

This SOP and the attached **Soil Management Checklist (Attachment 1)** are for use at all sites where activities will disturb the soils. In addition to construction activity, this includes such activities as (but not limited to) grubbing, grading, excavation, and significant heavy equipment traffic over soils. Adherence to the policies and procedures identified in this SOP is required for Picatinny to properly manage and track the movement of potentially contaminated soil removed during the above referenced activities.

The **Soil Management Checklist and Flow Diagram** outlines general soil management requirements related to Picatinny construction activities. Detailed guidelines describing the Installation's required soil management policies are provided in this Soil Management SOP. The Checklist should be reviewed and completed by all Department of Public Works (DPW) project managers and contractor site construction managers. A completed Checklist with supporting documentation should be submitted to EAO/Johnson Controls (Elaine Comings x-8010) for review.

This SOP does not address potential water treatment requirements if storm water or other water erosion effects cause water discharges from the site to exceed NJ Pollutant Discharge Elimination System (NJPDES) regulatory limits. Nor does it cover NEPA, stream encroachment, wetlands, NJPES, or other permits that may be required as part of the construction planning process. The project proponent must contact the Environmental Affairs Office (EAO) x5818 to obtain an evaluation of all the potential or applicable permitting requirements for a proposed activity using EAO's most recent **Program Requirements Checklist (Attachment 2).**

3.1 Definitions

<u>Contaminated Soil:</u>
Soil, which contains one or more contaminants from an unintentional or intentional spill or release of a hazardous substance, hazardous waste or pollutant at a concentration, which exceeds applicable remediation standards.

<u>Hazardous Soil:</u>
Soil is considered "hazardous" when any of the following criteria are met:

a. Soil tests positive for characteristics of a hazardous waste defined at Title 40 CFR Part 261 Subpart 261.21-261.24.

b. Soil containing a listed waste as per 40 CFR 261 Subpart D 261.31-261.33.
c. Soil containing a mixture of a solid waste (non-hazardous) and one or more hazardous wastes listed in 40 CFR261 Subpart D 261.31-261.33.

Hazardous soils must be removed for treatment or disposal. This material must be properly manifested; transported by a licensed, insured hauler; and go to a facility authorized to accept hazardous soils.

Non-hazardous Soil:

Soil is considered to be ID-27 non-hazardous when the following criteria are met:

a. The soil contains levels of contaminants exceeding NJDEP soil cleanup criteria (as per NJDEP proposed rule entitled Cleanup Standards for Contaminated Sites, N.J.A.C. 7:26D) however at levels not considered hazardous as per definition by Title 40 CFR.

b. The contaminant levels in soil exceed the site-specific cleanup criteria.

Soils classified as non-hazardous ID-27, can be re-used onsite (with prior approval of NJDEP, USEPA and EAD) or transported by a licensed hauler to a facility authorized to receive solid waste.

Clean Soil:
Soil that contains contaminants at levels below the most stringent site cleanup levels established by the NJDEP for that specific site. These soils can be reused without treatment or prior approval of NJDEP or USEPA.

3.2 Applicable Documents

NJDEP “Soil Management Procedures”

Inter-Agency Agreement (IAG) with the EPA Docket II-CERCLA-FFA-00104

Army Regulation AR200-1 and the relevant sections of the National Environmental Protection Act (NEPA)

Army Regulation AR415-15, dated September 4, 1998

NJDEP “Field Sampling Procedures Manual” dated February 1988

NJDEP Technical Requirements for Site Remediation, N.J.A.C. 7:26E

NJDEP proposed rule entitled Cleanup Standards for Contaminated Sites, N.J.A.C. 7:26D

SOP for “Decon to Degree of 5X and Demolition of Contaminated Buildings”

4.0 General Procedures For All Soil Disturbance Activities

When construction activity is contemplated, AR415-15 requires all proposed construction sites be evaluated to determine the potential for encountering contamination through

qualitative analysis. If the site evaluation concludes that the potential for contamination exists, then soil sampling and analysis may be necessary to determine if the site is contaminated and provide a quantitative analysis of the site.

All construction projects or any project resulting in the excavation or movement of soil planned by any office at the Arsenal must complete and submit an **Environmental Work Request for Site Clearance/Soil Management** (Attachment 3.) to the EAO for review and approval prior to implementing the proposed work.

4.1 Environmental Work Request Requirements

The *Environmental Work Request for Site Clearance/Soil Management* should provide information regarding the following:

a. Proposed location of project; with a map which showing location and construction footprint.
b. Brief description of the project and scope of construction.
c. Description of where soils will be disturbed and/or excavated, the depth of soil removal, and the anticipated amount of excess soil to be generated. Indicate if excess soil will be graded onsite or moved to another location.
d. Provide a time schedule for the project.

EAO/JCI representatives will evaluate the information submitted in the *Environmental Work Request* and determine the need for additional site investigation and sampling prior to initiating the proposed construction activities. EAO/JCI will provide this determination within 2 weeks. Sampling to determine if a site is clean prior to any construction activity generally requires 4 to 8 weeks for scheduling, sampling and analysis. Therefore, the project schedule should make allowances for completing a site evaluation as necessary. Requirements for determining the need for additional investigation are presented below in Section 4.1.1 Site Evaluation Sampling Requirements. At some sites only sampling of the excess soil (for classification and re-use purposes) will be required.

Emergency utility line replacements or repairs are exempt from these requirements. The Department of Public Works (DPW) has a copy of the installations **Remedial Action Concept Plan,** which identifies existing sites requiring investigation and/or cleanup. Safety precautions must be taken during emergency repairs and for the management of obviously contaminated soil when utility line repair is required. EAO/JCI representatives should be notified @ x8010 within 24 hours to coordinate management of any excess soil issues associated with the emergency response activity.

4.1.1 Site Evaluation Sampling Requirements

AR 415-15 requires that all proposed construction sites be evaluated by the installation for potential site contamination and categorized as one of the following:

<u>Category I:</u>
These sites are located in traditional non-hazardous locations such as administrative, recreation, residential housing or wooded areas. The installation has no reason to suspect contamination, so in general, no sampling is required.

Category II:
These sites consist of former industrial sites or other hazard-producing areas. This site category includes locations that have a potential for contamination due to former use. Sampling will be required at Category II sites however there may be exemptions. If the nature of the project is small and no excess soil is generated, sampling will not be required. For example, projects such as the installation of a new utility line, shed or transformer pad may be exempt.

Category III:
This category includes sites, which are known to be contaminated. Alternate project sites should be considered if a project is proposed in a Category III location. Some NPL designated Category III sites are subject to future use restrictions and therefore cannot be used based on proposed or approved remedial actions.

EAO will make a determination of the appropriate category. The project proponent is required to pay for sampling and analytical costs. These activities typically cost approximately $500 to upwards of thousands of dollars depending on the number of samples, required QA/QC protocols and the type of chemical analyses. In the absence of previously collected site investigation data, sampling will be required at Category II sites. Because of liability issues, sampling might also be required at Category I sites if the project will generate excess soil requiring offsite disposal. In addition, the project proponent should consider the time to plan, conduct and evaluate soil sampling in their project's overall schedule.

5.0 Site Investigation Sampling and Analysis

If an ***Environmental Work Request for Site Clearance/Soil Management*** evaluation indicates that a site may be contaminated, a ***Sampling and Analysis Plan*** should be developed for approval by EAO. The project proponent should contact the EAO to coordinate and discuss options for managing required sampling and/or investigations. EAO will provide information on any known contamination to the project proponent for inclusion in the Plan. The Sampling and Analysis Plan should be biased to sample locations with the greatest likelihood of contamination with the highest concentration levels. Proposed sampling should be completed in accordance with the New Jersey Department of Environmental Protection (NJDEP) Technical Requirements for Site Remediation, N.J.A.C. 7:26 E and the NJDEP Field Sampling Procedures Manual. These documents provide guidance on the required number of samples per location, placement of samples, sample depths, required analytical parameters, etc. Examples of choosing biased sampling points include:

- Sampling of outflow points from building drains and collection systems.
- Sampling of rain gutter outflows when hazardous materials may have been vented to the roof.
- Sediment sampling of sumps, manholes or catch basins.
- Boiler or compressor discharge points.

- Sediment sampling of ponds or drainage areas receiving stormwater runoff from the site.
- Sampling septic disposal fields and other wastewater treatment/disposal systems.
- Sampling around above-ground or underground storage tanks.
- Loading and unloading areas.
- Chemical storage and staging areas.
- Dumpsters or other disposal areas.

5.1 Investigation of Buildings Requiring TECUP Procedure

Specialized Picatinny site investigation procedures and sampling requirements, such as those associated with building demolitions requiring **TECUP procedures**, are addressed within the **SOP for Decon to Degree 5X and Demolition of Contaminated Buildings (DPW SOP AR-XP-WO19).** The **TECUP SOP** contains instructions on required procedures for the investigation and remediation of buildings and subsurface utilities containing energetic materials. This document should be utilized in addition to the Soil Management SOP to determine specific soil management criteria for soils containing energetic materials.

6.0 Construction Planning/Site Excavation

After conducting a site investigation and any associated sampling and analysis for the site, the Site Construction Project Manager (SCM) should contact the EAO and request an evaluation of the findings report to determine if a re-location of the planned construction is warranted.

If the site has soils with contamination levels exceeding NJDEP cleanup criteria, it may be recommended that the soils not be disturbed as part of a construction activity but rather addressed as a separately funded remedial action. In addition, previously established Inter-Agency Agreements with State (NJDEP) and Federal (USEPA) regulatory agencies, including those developed as per a Record of Decision (ROD) and Land Use Control Restrictions, may preclude consideration of certain construction activities at a site. Consequently, the Project Manager must contact the EAO to obtain information and data associated with any potential use restrictions established for a site.

If the site has soils with contamination levels exceeding NJDEP cleanup criteria and those soils need to be excavated as part of the construction plan, the following soil management criteria will apply.

6.1 Soil Excavation Requirements

For large construction projects and major contracts such as those involving the demolition of structures followed by construction of new buildings or extensive construction of underground utilities, the SCM or contractor must develop a **Soil Management Plan (SMP)** for EAO review. The SMP should address issues regarding the procedures for the removal, handling, stockpiling, sampling, documenting, manifesting, transportation and disposal of

excavated material. The proposed activities within the SMP shall comply with criteria established in this SOP as well as all State and Federal regulatory requirements for managing contaminated soil.

Smaller projects will be exempt from the requirement to complete a SMP, however compliance with the soil management criteria identified below will be required.

6.1.1 Soil Excavation/Management of Excess Soil

Soils excavated during construction may be re-used at the project site if certain criteria are met. These criteria will apply to all construction related projects including the installation of subsurface utilities. Excavated material, which cannot be utilized at the same project location shall be considered excess soil and should be handled in accordance with the requirements detailed in Sections 6.2 and 6.3 of this document. All excess soil must remain separate from other materials such as rock, concrete, asphalt and demolition or construction debris.

All soils removed during the construction process must be visually screened for the presence of obvious contamination. If, during the course of the construction/excavation project, signs of contamination (stained soils, odor, drums, drain lines, etc.) or contamination pathways are encountered, then the Construction Project Manager must contact EAO immediately to request an environmental evaluation of this new site information.

Visually contaminated material must be segregated, properly stockpiled and characterized for future transport and disposal. Post-excavation sampling will also be required for those areas where visually contaminated soil is removed. Sampling shall be completed by the construction contractor or a qualified subcontractor in accordance with the requirements provided in the NJDEP Technical Requirements for Site Remediation, N.J.A.C. 7:26 E and the NJDEP Field Sampling Procedures Manual.

Soil not visually contaminated can be re-used for backfilling or grading purposes as long as the material is returned to the approximate position of its' original location. For example, the Site Construction Manager/Contractor should attempt to replace the soils back into the excavation at the same relative soil horizons as existed prior to excavation activities. It should be understood, however that large-scale re-grading is unacceptable at NPL designated sites, which will require future soil remediation or are regulated by Land Use Controls. If re-grading is necessary for a project within a NPL site, EAO personnel must be contacted by the Construction Project Manager in order to clear those areas where re-grading is proposed. Specific details regarding planned grading requirements should be provided within the Environmental Work Request for Soil Clearance/Soil Management previously discussed in Section (4.1) of this SOP.

If a project requires clean fill material from a source outside of the installation, the SCM must provide documentation to EAO, which shows that the fill used is certified virgin material from a commercial source. Bills of lading should also be provided to the EAO to document the source and volume of fill material. In addition, The SCM must forward a completed ***"Soil Management Report Document (*Attachment 4*)*** to Elaine Comings (ext 8010) at EAO/JCI personnel. The Clean Soil Management Document should include a detailed site map delineating the location where clean fill material is used.

6.2 Management of Visually Contaminated Soil

Visually contaminated material must be segregated, properly stockpiled separately from any other stockpiles and characterized for future transport and disposal. Excavated soil should be placed on and covered with plastic at least 10 millimeters in thickness. Hay bales or something similar should be placed around the soil pile to control erosion and the plastic should be periodically checked prior to disposal. In addition, each stockpile must be properly tagged and labeled for future identification by EAO personnel. Information regarding the source location, date of excavation, estimated soil volume and the designated SCM contact, should be included on the label. The SCM must complete and submit a ***Potentially Contaminated Soil Management Record*** **(Attachment 5)** to Elaine Comings (ext 8010) at EAO/JCI and contact the EAO to obtain direction and guidance as to where excavated material should be stockpiled prior to disposal.

Waste Classification sampling and analysis of stockpiled soils shall be completed by the project contractor or a qualified subcontractor in accordance with the requirements provided by the designated disposal facility, NJDEP Division of Solid & Hazardous Waste Regulations and the NJDEP Field Sampling Procedures Manual. Required waste characterization parameters typically include Toxic Characteristic Leaching Procedure (TCLP) and Targeted Analyte List (TAL) analyses. Waste characterization results as well as detailed information regarding the source location of the material (including a map), the date of excavation and the estimated volume of material, must be submitted by the SCM to the EAO for review prior to transport and disposal.

The Site Construction Manager will be required to manifest and transport soil, which is characterized as hazardous, to an EPA approved offsite facility for treatment or disposal. The SCM must contact the EAO to obtain Picatinny's listing of EPA approved disposal facilities. Waste disposal manifests should be obtained directly from the selected disposal facility. The SCM will also be required to submit copies of all completed manifests to the EAO for regulatory reporting purposes. In accordance with NJDEP regulatory requirements, all hazardous soil must be removed for disposal within 90 days of generating the material.

6.3 Management of Soil/Excess Soil Not Visually Contaminated

Soil, which does not appear to be visually contaminated, can be re-used for backfilling or grading purposes at the site as long as the material is returned to the original location and approximate depth of removal. Characterization sampling is not required for soil, which is returned to its point of origin.

Any soil that is not used during the construction activity is considered excess soil. This material must be characterized to determine if it can be stored in Picatinny Arsenal's Soil Excess Area or whether it must be manifested and transported offsite for disposal.

Consequently, excess soil, which cannot be re-used, must be temporarily stockpiled at the project location and characterized (sampled and analyzed) for classification. This soil should be placed on and covered with plastic at least 10 millimeters in thickness. All excess soil must remain segregated from other materials such as visually contaminated soil, rock, concrete, asphalt and demolition or construction debris. Additionally, soil piles must

remain segregated by Building or Site Area and each stockpile must be properly tagged and labeled for future identification. Information regarding the source location, date of excavation, date of sampling, estimated soil volume and the designated SCM contact, should be included on the label. The SCM must forward a completed ***"Potentially Contaminated Soil Management Manifest and Record" Document (*****Attachment 5*****)*** to Elaine Comings (ext 8010) at EAO/JCI. The *Manifest and Record* should include a detailed site map indicating the location of excavated material as well as the location and final dimensions of the excavation or trench area.

Subsequent Waste Classification sampling and analysis of stockpiled excess soils shall be completed by the project contractor in accordance with the NJDEP Technical Requirements for Site Remediation, 7:26 E-6.4 "Post Remedial Action Requirements" and the NJDEP Field Sampling Procedures Manual. Soil samples should be collected at a frequency of 1 sample per 20 cubic yards for the first 100 cubic yards followed by 1 sample for each additional 100 cubic yards thereafter. Samples must be analyzed for (1) Targeted Analyte List (TAL) Metals by USEPA SW-846 Method 6020 (2) Semi-volatile Organic Compounds by USEPA SW-846, Method 8270B. Analysis for Explosives by USEPA SW-846, Method 8330 will also be required at sites where explosives are a contaminant of concern. Waste characterization results must be submitted by the SCM to the EAO for review prior to transport or disposal.

Excess soil characterized as non-hazardous industrial waste, shall be transported by the project contractor, to a designated installation soil storage area. Soils classified as hazardous must be managed in accordance with the requirements summarized above in Section 6.2 of this document. The SCM must coordinate with the EAO to determine the exact location for storage of excess soil. Additionally, excess soil identified for removal and transport to a designated installation storage area must be tracked utilizing the Picatinny Arsenal ***Excess Soil Manifest and Record*** **Document (Attachment 6)**. Completed Records must be forwarded by the SCM to Elaine Comings (ext 8010) at EAO/JCI.

Again, soil piles, which are transported to a soil storage area, must remain segregated by Building or Site Area and each stockpile must be properly tagged and labeled for future identification. Information regarding the source location, date of excavation, date of sampling, estimated soil volume and the designated SCM contact, should be included on the label.

7.0 Erosion Control

All construction/excavation activities must be conducted in a manner, which minimizes the potential for offsite transport of sediments by either wind or water erosion during the construction/excavation activity. In addition, if the disturbed area is greater than 5000 square feet, a Soil Erosion and Sediment Control Plan must be submitted to the Morris County SCS office.

7.1 Erosion Control Measures Prior to Excavation

Currently, there are no protection measures necessary for wind erosion prior to excavation activities. Protection from water erosion should be developed however, prior to disturbing any soils. Required protection measures include construction of diversion ditches up gradient of the excavation site. The ditches must be capable of containing a volume of

runoff typical of a 25-year 24-hour rainfall storm event. This will minimize or eliminate run-off erosion of loose soils resulting from the excavation/construction activity.

Down gradient of the excavation site, silt fences or sediment ponds shall be constructed to capture sediment, which might be transported off-site due to a rainfall event. Sediment fence material (i.e. opening size selection) and sediment pond detention time requirements will depend upon the soil type expected in the excavation. Therefore, a soils evaluation must be performed prior to installation of the erosion control measures. When silt fences are used, they must be installed at least 6 inches below ground surface to ensure that runoff will be properly filtered through the silt fence. Upon reaching 75 percent of capacity, a second fence must be constructed unless soils are removed (and stored in the temporary soil storage area) in order to re-establish sediment storage capacity.

7.2 Erosion Control Measures During Excavation

During excavation temporary storage/staging areas are often established on or adjacent to the excavating site. These on-site storage/staging areas should be clearly delineated, grubbed of vegetation and topsoil removed (unless the area is for topsoil storage) to prevent subsurface soils from mixing with existing topsoil. Additionally, a ditch or berm should be constructed around the staging/storage area to contain erosion of the soil stockpile.

During the construction/excavation project, erosion control will include maintenance of the erosion control measures established as per Section 7.1 and implementation of additional erosion control measures as necessary. If there is a significant amount of truck traffic over dirt roads, dust control may be warranted. Dust control of dirt roads may be maintained with water or preferably a mixture of water and commercially available additives such as DOWFLAKE (sodium carbonate), which will reduce the amount of water required to achieve good dust control. The soil at temporary onsite storage/staging areas must be placed on and covered with plastic sheeting to eliminate wind and water erosion.

7.3 Post Construction / Excavation Erosion Controls

When construction is completed, subsurface soils are returned into the excavation first. Previously removed, stored topsoil from the site is then placed above the subsurface soils. This is to restore the soil horizons back to what existed before soil disturbance. Subsequent to backfilling and re-grading, the affected area should be seeded with a wheat/grass/clover mix and covered with straw or mulch. The erosion control measures established for the project (i.e. diversion ditches, silt fences and sediment ponds) should be closed only after re-establishing good vegetative cover. Additionally, when erosion control measures are closed, the affected area should be restored to the original grade existing prior to construction, seeded with a wheat/grass/clover mix and covered with straw or mulch material.

8.0 Soil Storage Management

Excess soil, characterized as clean or contaminated (but non-hazardous) material, may be stored at designated excess soil management sites. As discussed in Section 6.3, the SCM

for the project must contact EAO/JCI personnel to obtain direction on locating a soil storage area, which can accommodate project needs. The project manager or contractor utilizing each of these sites must establish erosion control measures as defined in Section 7.0 of this document. As these soil management areas will be used over a long term, erosion controls for stormwater runoff shall include a sediment pond or basin for contaminated soils, in addition to silt fences. Each designated site shall contain either clean or contaminated soils but not both in order to ensure proper storage and re-use. Soil stockpiles must be segregated by Building location, source area and soil classification (i.e. topsoil, clean soil, petroleum contaminated soils, non-hazardous heavy metals contaminated soils, etc.).

The ideal soil storage site should be located in an area with zero to two percent slopes and have erosion control measures at least ten feet above the 100-yr flood plain. In addition, the site should be located a sufficient distance away from steep slopes to eliminate potential stockpile erosion from large volumes of high velocity storm water. The SCM for a project generating excess soil will be responsible for closely monitoring the condition of soil piles while in the soil storage area. Soil piles shall be inspected by the SCM or designated alternate at least once per month in order to ensure that stockpiles are adequately covered and protected and that erosion control measures are functional.

8.1 "Clean" Soil Storage Management

Soils that are classified as clean can be used in an unrestricted manner at industrial sites in Picatinny Arsenal. "Clean" soils should be stored in a minimum of two separate piles, one for topsoil and one for other soils. Additional segregation by soil type may be employed for geo-technical considerations in future reuse plans. If clay soils, rocky soils, sandy soils, etc. are stored in separate piles then the reuse potential of excess soils is enhanced. This additional segregation is not required but rather is optional to the user. There will be no restrictions in composting "clean" soils from various sites around the Arsenal. Soils will be reused on a Last In / First out (LIFO) basis in order to minimize disturbing established vegetative cover on soil storage piles.

8.2 "Contaminated" Soils Storage Management

The greatest risk is from water transport of contaminated soils; therefore, additional measures must be taken to protect the environment from potential discharges from the soil management area. The contaminated soils storage site will be located, if possible, within an area containing an impervious surface such as asphalt or cement pavement. Additionally, soil piles should be placed on and covered with plastic at least 10 millimeters in thickness. These measures will ensure protection of surrounding soils and groundwater resources at the soil storage site.

Soils must be segregated by primary contaminant type (i.e. gasoline contaminated, diesel contaminated, heavy metals, pesticides, etc) so that the reuse potential can be maximized. Base on soil characterization data, soils of a similar contaminant type may be combined and sited into one pile. Each stockpile in the storage area must be properly tagged and labeled for future identification. Information regarding the source location, date of excavation, date of sampling, estimated soil volume and the designated SCM contact, should be included on the label.

9.0 Soils Re-Use Considerations

Soils that are *"Clean"* can be reused at Picatinny without restriction upon receiving approval of the Picatinny EAO. "*Contaminated Non-hazardous"* soils can be re-used at industrial sites within Picatinny. However, re-use proposals will require prior approval of the NJDEP, USEPA and Picatinny EAO. The primary consideration in determining re-use options is the potential for future transport of contaminated non-hazardous soils off site due to erosion and/or impact to groundwater. Contaminated non-hazardous soils cannot be used as the top layer of fill material at any site because of the risk of exposure to factors such as surface, wind or storm water erosion. However, if a protective, impervious cap (i.e. asphalt roadways, parking lots, buildings, etc) is created as part of the construction activity, then the contaminated non-hazardous fill may be used immediately below that protective layer.

Attachment 1.

Picatinny Arsenal
Environmental Affairs Office

Soil Management SOP Checklist

1. Purpose

This checklist and the attached flow diagram support the proper management and oversight of soil management activities as provided in Picatinny's Soil Management SOP. This checklist will help DPW project managers and contractor site construction managers identify applicable requirements for compliance with State and Federal solid waste management criteria. Additionally, this checklist identifies the general soil management and environmental protection considerations that must be addressed when soils at Picatinny Arsenal are disturbed during construction activities.

The objective of the checklist is to provide a uniform framework for managing and tracking the movement of soil at Picatinny Arsenal. This checklist will assist the user in identifying and documenting specific soil management requirements related to the construction process. When used, this checklist should also assist the project proponent in assessing potential impacts of these soil management requirements on proposed budgets and schedules.

2. Scope

The scope of this document covers all soil movement and soil management activities associated with construction at Picatinny.

3. Instructions for Completing Checklist

In each section, answer each question and include descriptions of current site conditions and activities applicable to the construction project being reviewed. In responding, the preparer must consider all relevant or available information and attach supporting documentation as necessary (i.e. Soil Manifests, analytical data, etc.). Detailed guidelines describing the Installation's required soil management policies are provided in the Soil Management SOP. Environmental/Site Clearance checklists and manifests can be found as attachment to the SOP or obtained from Picatinny EAO. This form and all supporting documentation should be forwarded to Elaine Comings (ext-8010) at EAO/Johnson Controls for review.

Picatinny Arsenal
Soil Management SOP Requirements Checklist

Section I: Pre-Construction Requirements

1. All construction projects or any project resulting in the excavation or movement of soil must complete and submit an **Environmental Affairs Program Requirements Checklist. Has this checklist been completed? : Yes____ No_____**

2. All construction projects or any project resulting in the excavation or movement of soil must complete and submit an **Environmental Work Request for Site Clearance form. Has Site Clearance Request been completed? : Yes____ No____**
**If yes, please indicate assigned site clearance number: _____

Section II: Site Construction/Project Implementation Requirements

1.Will proposed construction activities generate excess soil? **Yes___ No___**
**If yes, indicate estimated volume:_____cu yds. (or) tons

2. Will excess soil be utilized at the project site for purposes such as backfilling or re-grading? **Yes___ No___**

If no, the project manager must complete and submit a **Potentially Contaminated Soil Management Record to Elaine Comings (ext 8010) at EAO/Johnson Controls.
Has a manifest record been submitted to EAO? Yes___ No___

3. Excess soil that cannot be utilized at the project site (ie.visually contaminated soil or soil which cannot be used for backfilling or re-grading purposes) must be properly stockpiled, sampled and laboratory analyzed in order to characterize the material for future use or disposal. Sampling requirements are identified and discussed in the Soil Management SOP**. Have soil samples been collected and analyzed? Yes___ No___**

**If yes, the project manager must submit a complete laboratory data package to EAO personnel for review. This data will be used by EAO to classify the soil as hazardous or non-hazardous.

4. Have stockpiled soils been characterized as:

a. Hazardous? _____
b. Non-hazardous_____

5. Will the project require use of clean fill material? Yes___ No___

If yes, the project manager must provide documentation to Elaine Comings (ext.8010) at EAO/Johnson Controls showing that the fill is certified as clean. Bills of lading must also be provided to EAO as well as a **Picatinny Soil Management Report Document. **Has a Soil Management Report been completed and submitted to EAO? Yes___ No___**

Section III: Management of Excess Soil

1. Non-Hazardous Soil:

Any soil not re-used during the construction activity is considered excess soil. Excess soil characterized, as **"non-hazardous"** shall be transported from the construction site to a designated Installation storage area. Detailed guidelines regarding Picatinny's soil storage requirements are provided in the Installation's Soil Management SOP, Sections 6.3 and 8.0 to 8.2. In general, soil piles must remain segregated according to Building or Site location and each stockpile must be staked, tagged and labeled for future identification. Information regarding the source location, date of excavation, date of sampling, estimated soil volume and the project POC should be included. Additionally, excess soil identified for removal and transport to an installation storage area must be tracked utilizing the Picatinny Arsenal **Excess Soil Manifest and Record Document.**

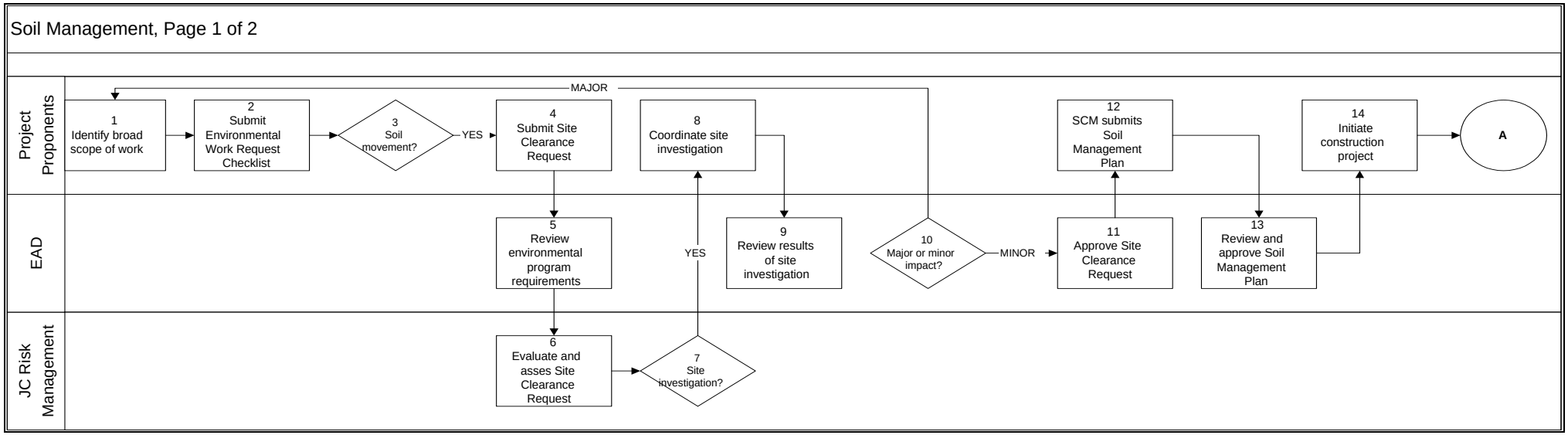
Has an Excess Soil Manifest and Record been submitted to EAO/Johnson Control personnel? Yes___ No__

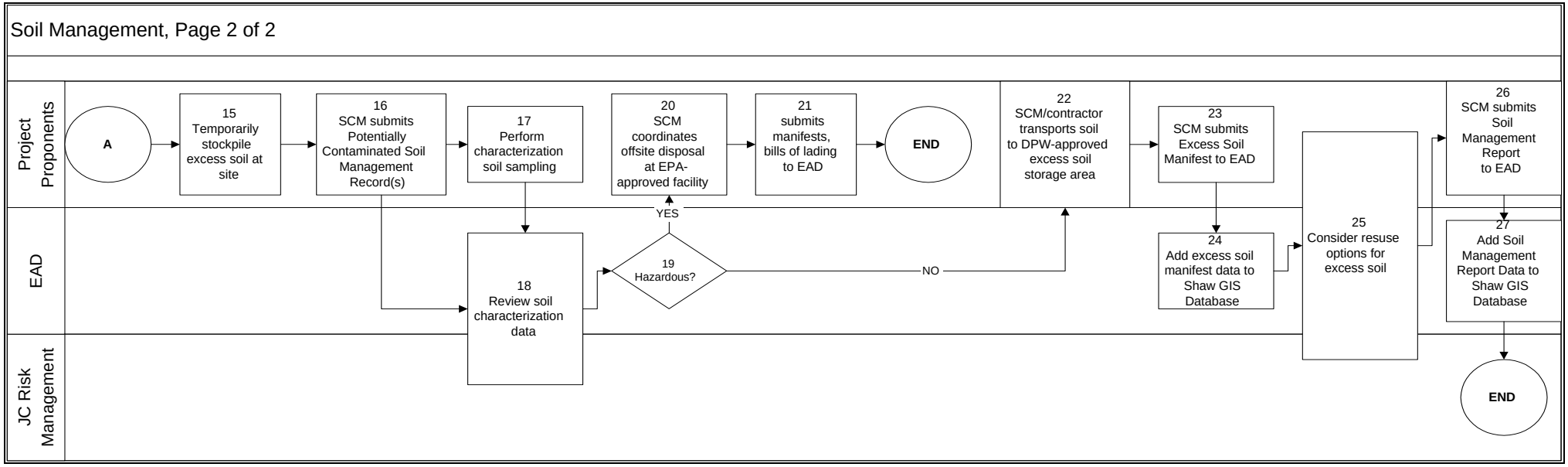
2.Visually Contaminated and/or Hazardous Soil:

Any soil, which is visually contaminated or characterized as "hazardous" must be transported offsite for disposal at an EPA approved disposal facility. The project manager must contact EAO representatives to coordinate the transportation and disposal process.

Waste disposal manifests should be obtained from an approved disposal facility. The site construction manager is required to submit copies of all completed manifests to the EAO. All hazardous soil must be removed for disposal within 90 days of generating the material.

Have completed manifests been submitted to EAO personnel?
Yes___ No___


Soil Management, Page 1 of 2
Project Proponents
EAD
JC Risk Management
1 Identify broad scope of work
2 Submit Environmental Work Request Checklist
3 Soil movement?
YES
MAJOR
4 Submit Site Clearance Request
5 Review environmental program requirements
6 Evaluate and asses Site Clearance Request
7 Site investigation?
YES
8 Coordinate site investigation
9 Review results of site investigation
10 Major or minor impact?
MINOR
11 Approve Site Clearance Request
12 SCM submits Soil Management Plan
13 Review and approve Soil Management Plan
14 Initiate construction project
A


Soil Management, Page 2 of 2
Project Proponents
EAD
JC Risk Management
A
15 Temporarily stockpile excess soil at site
16 SCM submits Potentially Contaminated Soil Management Record(s)
17 Perform characterization soil sampling
18 Review soil characterization data
19 Hazardous?
YES
NO
20 SCM coordinates offsite disposal at EPA-approved facility
21 submits manifests, bills of lading to EAD
END
22 SCM/contractor transports soil to DPW-approved excess soil storage area
23 SCM submits Excess Soil Manifest to EAD
24 Add excess soil manifest data to Shaw GIS Database
25 Consider resuse options for excess soil
26 SCM submits Soil Management Report to EAD
27 Add Soil Management Report Data to Shaw GIS Database
END

Attachment 2.

Environmental Affairs Program Requirements Checklist

(Rev. June 26, 2003)

The purpose of this checklist is to ensure that all environmental requirements are identified during the project-planning phase for all new projects including construction, testing, CRADAs, licenses, and leases. Accurate completion of this checklist will reduce project delays by providing sufficient time to perform environmental evaluations to determine the need for design changes and/or environmental permits. In many cases, environmental permits are needed before construction begins and due to the lengthy permit application process it is important that these environmental issues be addressed during the design phase.
Please answer the attached questionnaire. If the answer to any questions is "YES", include an explanation in the space provided at the end of this questionnaire. Upon completion, return this checklist to Carol McLaughlin, AMSTA-AR-PSE, Building 319, or by electronic mail at cmclaugh@pica.army.mil.

Project Title:
Proponent Directorate:
Point of Contact (Name, Phone #):
Anticipated Project Start Date:
Briefly Describe the Project and the Building(s)/Area(s) That Will Be Affected.
ENVIRONMENTAL AFFAIRS OFFICE
PROGRAM REQUIREMENTS CHECKLIST

AIR PROGRAM: Any source operation that emits an air contaminant is regulated, regardless of size. It doesn't matter if the air emissions are emissions are emitted indoors or outdoors. Some new sources and modifications to existing sources will require pre-construction and operating permits. Replacement of existing equipment with identical, new equipment requires a pre-construction permit. Pre-construction permits must be obtained before the new equipment is purchased or the existing equipment is altered. Most of the time, permits will not be needed. However, all source operations that have air emissions must be registered with the Environmental Affairs Division for inventory and reporting purposes.

STORMWATER PROGRAM: Procedures for the outdoor storage of materials either during construction or normal operations must be addressed. Ensure that there will be no exposure, during and after storm events, of industrial materials, machinery, waste products or other source materials located at the building. At all times, outside storage is to be raised off the ground, covered with a tarp, or put under a shelter. No operation is to discharge through separate storm sewers to surface waters.

NOISE PROGRAM: If this project will involve the generation of outdoor sound levels exceeding 65 decibels (continuous) or 80 decibels (impulsive) please notify the Environmental

Office. The Environmental and Public Affairs Offices will determine the procedure to be followed in notifying the local police and residents in the surrounding area in order to avoid noise complaints.

SPILL PREVENTION, CONTROL, COUNTERMEASURE AND CLEANUP PROGRAM: This program is to reduce the likelihood and impact of oil, hazardous materials, and hazardous wastes releases to the environment. The installation of any tank for the above storage is regulated under this program. This will require that the facility is designed IAW the standards in the regulations (tank secondary containment, transfer area secondary containment, high/low level alarms, SOPs), and that the facility operator receives the required training in the regulations. All tank installations have to be registered with the Environmental Office because new tanks need to be added to Picatinny's Spill Plan and because the operators have to receive the required training.

HAZARDOUS MATERIALS/HAZARDOUS WASTE PROGRAM: Any operation which utilizes hazardous materials, or may generate waste batteries or fluorescent light bulbs, regardless of the amounts, may be regulated under the hazardous waste regulations. Minor changes, even to current operations, may have significant impacts on facility permits. Notify the Environmental Affairs Office for all new operations or changes to existing operations when there is a possibility of generating a hazardous waste. When utilizing chemicals on base, all chemicals must be inventoried and accounted for at Picatinny's HAZMART. This is imperative for regulatory reporting on the use of chemicals at Picatinny. Also of note is to ensure chemicals, drums and containers are not stored outside if all possible.

DRINKING WATER PROGRAM: Any new drinking water lines or repairs to existing lines must be tested as safe prior to be placed in service.

OZONE DEPLETING CHEMICALS PROGRAM: Army installations have been directed to eliminate dependency on commercial availability of Class I Ozone Depleting Chemicals (ODCs) effective December 31, 2003. In addition, under the Clean Air Act Amendments, the EPA has been directed to establish standards and requirements regarding the use and disposal of Class I substances. These regulations include the requirement that reduce the use and emission of such substances to the lowest achievable level.

SEWER/WASTE WATER PROGRAM: All sanitary sewer water goes off-base to Rockaway Valley Regional Sewerage Authority (RVRSA). Any new discharges or increased flows into the sewer distribution system must first be approved by RVRSA and Picatinny Arsenal's licensed operator. Each discharge must adhere to the RVRSA permit requirements.

NATURAL RESOURCES PROGRAM (FLORA/FAUNA): A review and assessment of potential impacts to the physical terrain, its vegetative cover and use as wildlife habitat is necessary before any project is approved and undertaken. The proposed site and activity will be evaluated per known or likely occurrences of plants and animals. A site survey for specific plants and animals may be required in an appropriate season. Current policy for safeguarding the roosting and foraging habitats of the federally endangered Indiana Bat mandate that required tree felling or pruning be scheduled between 15 November and 1 April.

GENERAL CONSTRUCTION ACTIVITIES: Picatinny Arsenal is a Superfund site and has contaminated sections that present risk. In NJ, movement of soils is regulated. In order to comply with regulations and insure the safety of Arsenal personnel, it is imperative that any activities which involve soil disturbances, soil movement and new construction be coordinate through the Environmental Affairs Office.

NEPA PROGRAM: The NEPA process is the systematic examination of potential environmental impacts resulting from the implementation of a proposed action. Coordinating the NEPA process with Government action must occur at the earliest possible time to ensure informed decisions can be made based on the best available information. Early coordination helps to alleviate the possibility for delays later on in the project. All new projects must be assessed for NEPA applicability and compliance. Completion of this questionnaire will initiate the NEPA process.

Answer "YES" or "NO" to the following questions. For each "YES" answer, please explain in the space provided at the end of this checklist.

WILL THIS PROJECT INVOLVE:	**YES/NO**
1) The installation of any equipment that will emit an air contaminant?	_____
2) The modification of any existing air contaminant-emitting source?	_____
3) The replacement of any existing air contaminant emitting equipment with identical equipment?	_____
4) The reconfiguration of any existing air contaminant emitting exhaust stack (change in height, diameter, or location)?	_____
5) The installation of any fuel burning equipment such as boilers, hot water heaters, internal combustion engines or process heaters?	_____
6) The installation of any tanks for the storage of materials such as fuel oil, propane or any process raw material or waste material?	_____
7) The installation of any manufacturing equipment such as mixers, extruders, conveyors or kettles?	_____
8) The installation of any surface coating equipment such as spray booths or involve any type of surface coating process?	_____
9) The installation of any surface cleaning equipment such as spray or dip tank degreasers or involve any surface cleaning process?	_____
10) Any water or wastewater discharges?	_____
11) Putting anything into the sewer system besides domestic waste?	_____
12) The outside storage of any materials such as metals or drums?	_____
13) Any outdoor/exterior construction and/or additions?	_____
14) Any indoor construction or renovation?	_____
15) The generation of outdoor sound levels exceeding 65 decibels (continuous) or 80 decibels (impulsive)?	_____
16) The installation of any tanks for the storage of waste water or pink water?	_____
17) The use, storage or shipment of any chemicals or hazardous materials that require a Material Safety Data Sheet? If so, how will it be purchased?	_____
18) The generation of any waste chemicals, oils, paints, etc?	_____

19) The generation of any waste fluorescent light bulbs or batteries? _____

20) Any equipment containing halons, chlorofluorocarbons, hydrochlorofluorocarbons or solvents (carbon tetrchlorochoride, methyl chloroform)? _____
21) The servicing of any refrigeration equipment? _____
22) The servicing of any comfort cooling systems? _____
23) Will this project involve contractors interacting with ODCs or ODC equipment? _____
24) The use of any potable or non-potable water sources? _____
25) Connecting to any existing potable or non-potable water sources (within or out side of the building)? _____
26) The installation of any wells? _____
27) Any water or waste water discharges (i.e. floor drains, fire sprinkler testing, cooling water, emergency eyewash/showers etc)? _____
28) The installation of any septic systems? _____
29) The installation of any water or wastewater treatment equipment? _____
30) The cutting of any trees or clearing of any land? _____
31) Any new or post construction landscaping (perennial ground covers, lawns, shrubs, trees, annual or biennial flowers, mulch, etc.)? _____
32) Any outdoor testing? _____
33) The disturbance of any soils, bringing on site or removal from the site of any soil or fill material? _____
34) Any trenching, digging, or drilling? _____
35) The installation of any temporary roads? _____
36) The covering of any land surface with materials such as asphalt or concrete? _____
37) The disturbance of any painted surface? _____
38) Any real estate transactions such as a lease? _____
39) A private company either under or not under contract with TACOM-ARDEC? _____
40) The exterior alteration of an existing building? _____

For each question above for which you answered "YES", provide an explanation below.
Question # Explanation

Attachment 3.

Environmental Work Request for Site Clearance/Soil Management Site Restoration Program

A. Name of Project:

B.1. Proposed Location of Project (Map indicating footprint of Project):

B.2. Size of Structure:

C. Scope of Project concerning soil removal and/or depth of construction:

D. Description of the Project:

E. Description of how the soils and other wastes may be handled:

F. Construction Schedule:

Date:

POC: **Phone number:**

Organization:

Attachment 4.

POTENTIALLY CONTAMINATED SOIL MANAGEMENT
Manifest and Record

PROJECT NAME:

DEH PM:
CORPS PM:
CONTRACTOR PM:

DATE:

LOCATION OF PROJECT:_____
LOCATION OF PILE: _____
PROJECTED/ACTUAL VOLUME OF PILE (TONS/YDS): _____
DATE PILE EXCAVATED: _____
DEH PM:_____DATE:_____

SOIL HAS BEEN STORED AT:_____ DATE:_____
DEH PM:_____

MAP MUST BE ATTACHED _____

EAO POC:_____

ENVIRONMENTAL OFFICE – NOT FOR USE BY DEH OR CONTRACTOR
DATE SOIL MANIFEST SUBMITTED _____
DATE PLAN APPROVED *_____*
DATE SOIL SAMPLED _____
DATE RESULTS MADE _____
ANALYSIS # _____
APPROVED EROSION CONTROL PLAN YES_____ NO_____

SOIL IS CLEAN *_____*
SOIL IS SOLID WASTE *_____*
SOIL IS HAZARDOUS *_____*

DATE AND # DIRECTIVE SENT TO DEH _____

Attachment 5.

SOIL MANAGEMENT REPORT

PROJECT NAME:

DEH PM:
CORPS PM:
CONTRACTOR PM:

DATE:

LOCATION OF PROJECT:_____

SITE CLEARANCE #:_____

SOURCE OF FILL MATERIAL:_____

VOLUME OF MATERIAL:_____

LOCATION OF MATERIAL:_____

PLEASE ATTACH SITE MAP:_____

CLEAN FILL CERTIFICATION ATTACHED: YES_____ NO_____

BILL OF LADING ATTACHED: YES_____ NO_____

Attachment 6.

EXCESS SOIL MANAGEMENT
Manifest and Record

PROJECT NAME:

DEH PM:

SITE CLEARANCE #:

CORPS PM:

CONTRACTOR PM:

DATE:

LOCATION OF PROJECT _____
LOCATION OF EXCAVATION _____
PROJECTED/ACTUAL SIZE OF PILE _____

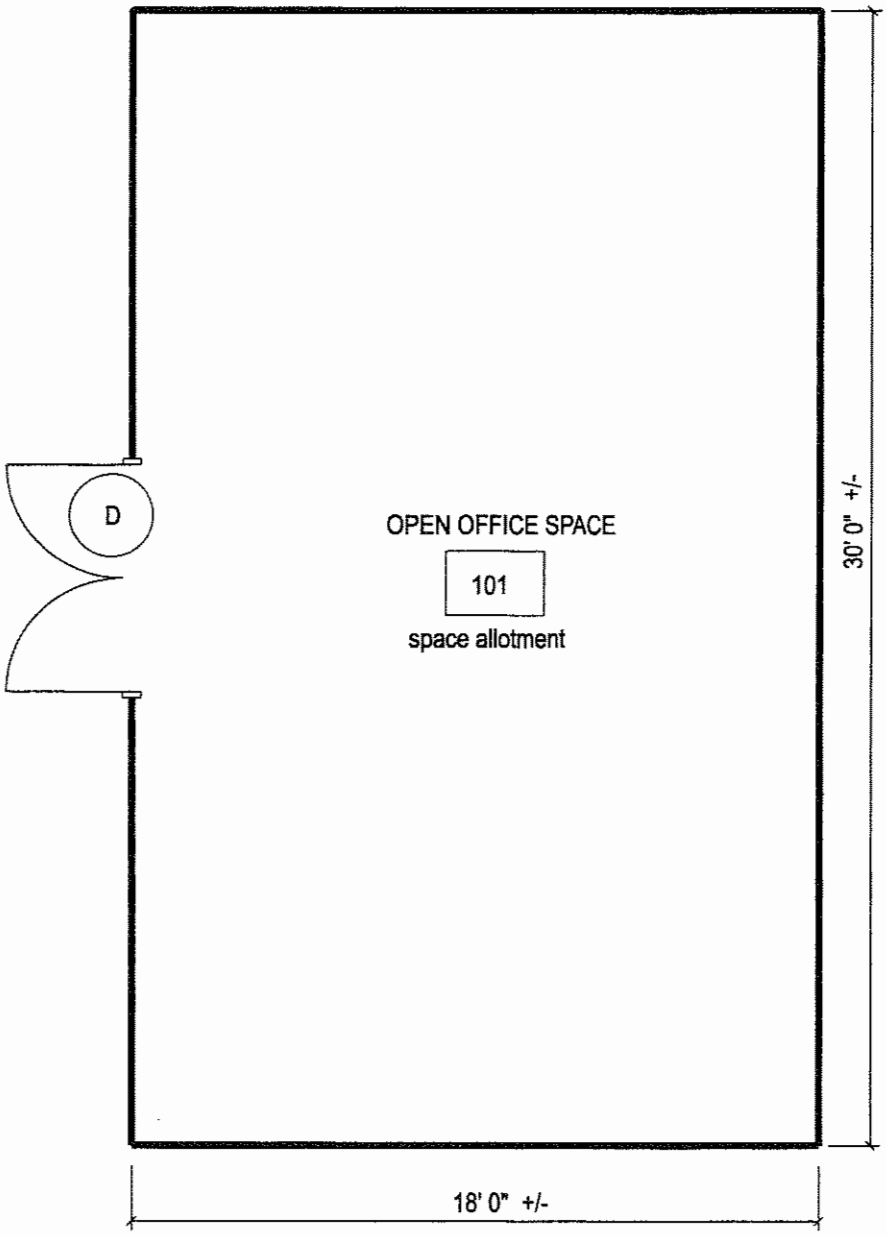
SOIL HAS BEEN STORED AT _____
*LOCATION OF PILE*_____
DATE _____
DEH PM _____

SOIL HAS BEEN TAKEN TO _____
*LOCATION OF PILE*_____
DATE _____
DEH PM _____

MAP MUST BE ATTACHED _____

*SOIL IS CLEAN: YES*_____ *NO*_____
*SOIL IS SOLID WASTE: YES*_____ *NO*_____

ATTACHMENT N



DOOR TYPE "E"

Double leaf to swing
180 Degree to outside

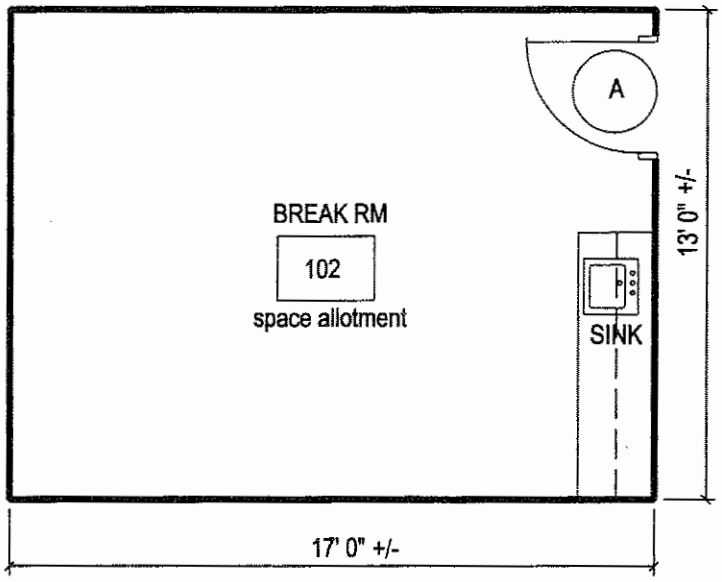
TO BE FURNISHED BY OTHERS:
- EQUIPMENT
- TV CAMERAS
- WORKBENCHES

N

OPEN OFFICE SPACE

4' 3' 2' 1' 0' 5' 10' 15'

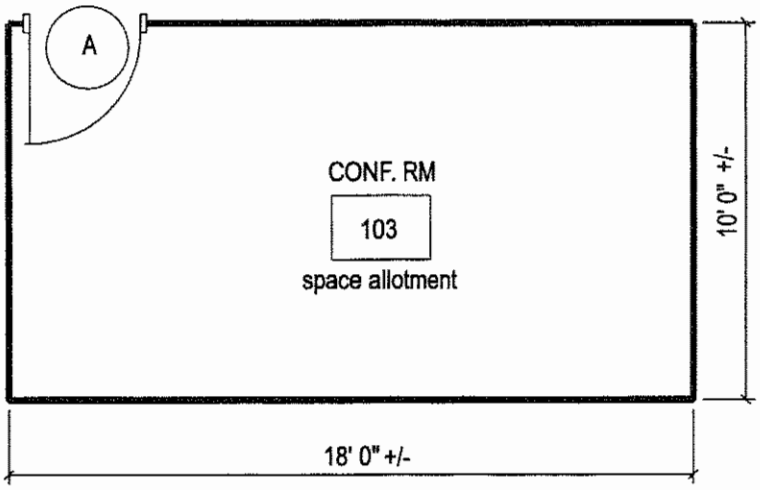
EXPLOSIVE R&D LOADING FACILITY



BREAK RM.

4' 3' 2' 1' 0' 5' 10' 15'

EXPLOSIVE R&D LOADING FACILITY



DOOR TYPE "E"

Double leaf to swing
180 Degree to outside

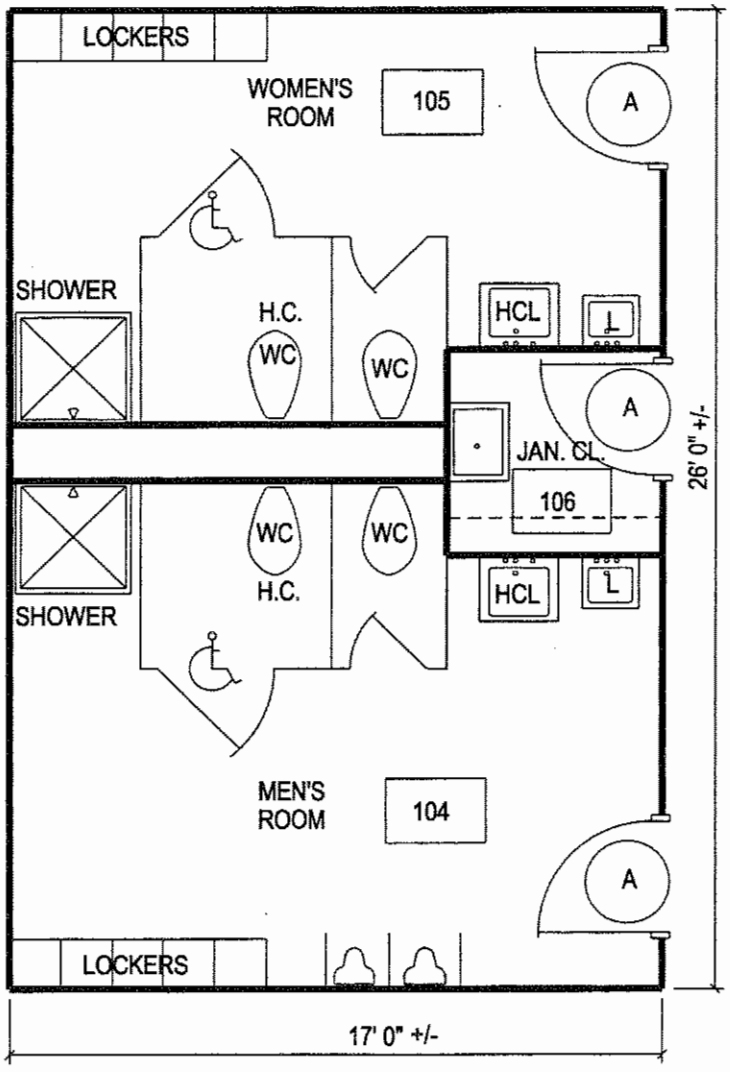
TO BE FURNISHED BY OTHERS:
- EQUIPMENT
- TV CAMERAS
- WORKBENCHES

N

CONFERENCE RM

4' 3' 2' 1' 0' 5' 10' 15'

EXPLOSIVE R&D LOADING FACILITY



space allotment

DOOR TYPE "E"

Double leaf to swing
180 Degree to outside

LAYOUT SHOWM MIN. DIMENSIONS ONLY.
BATHROOMS SHALL BE FULLY DEVELOPED
BY THE DESIGNER.

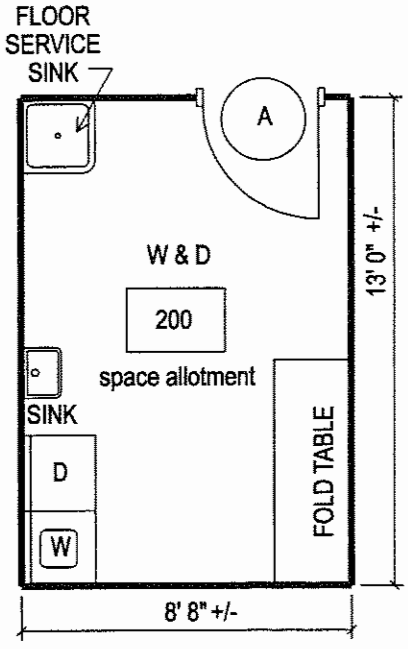
TO BE FURNISHED BY OTHERS:
- EQUIPMENT
- TV CAMERAS
- WORKBENCHES

N

RESTROOMS

4' 3' 2' 1' 0' 5' 10' 15'

EXPLOSIVE R&D LOADING FACILITY



DOOR TYPE "E"

Double leaf to swing
180 Degree to outside

FOLD TABLE, WASHING & DRYING MACHINES
BY OTHERS

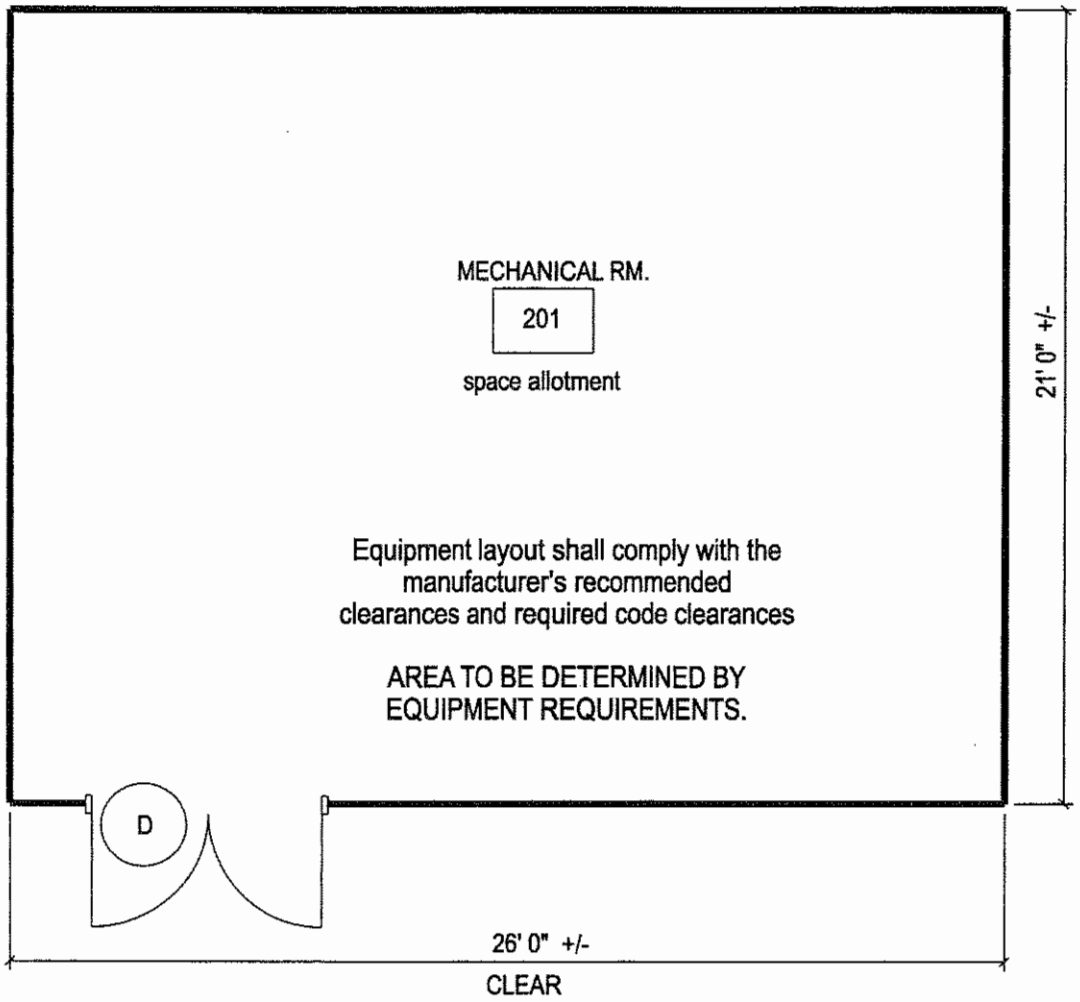
TO BE FURNISHED BY OTHERS:
- EQUIPMENT
- TV CAMERAS
- WORKBENCHES

N

WASHING & DRYING

4' 3' 2' 1' 0' 5' 10' 15'

EXPLOSIVE R&D LOADING FACILITY



DOOR TYPE "E"

Double leaf to swing
180 Degree to outside

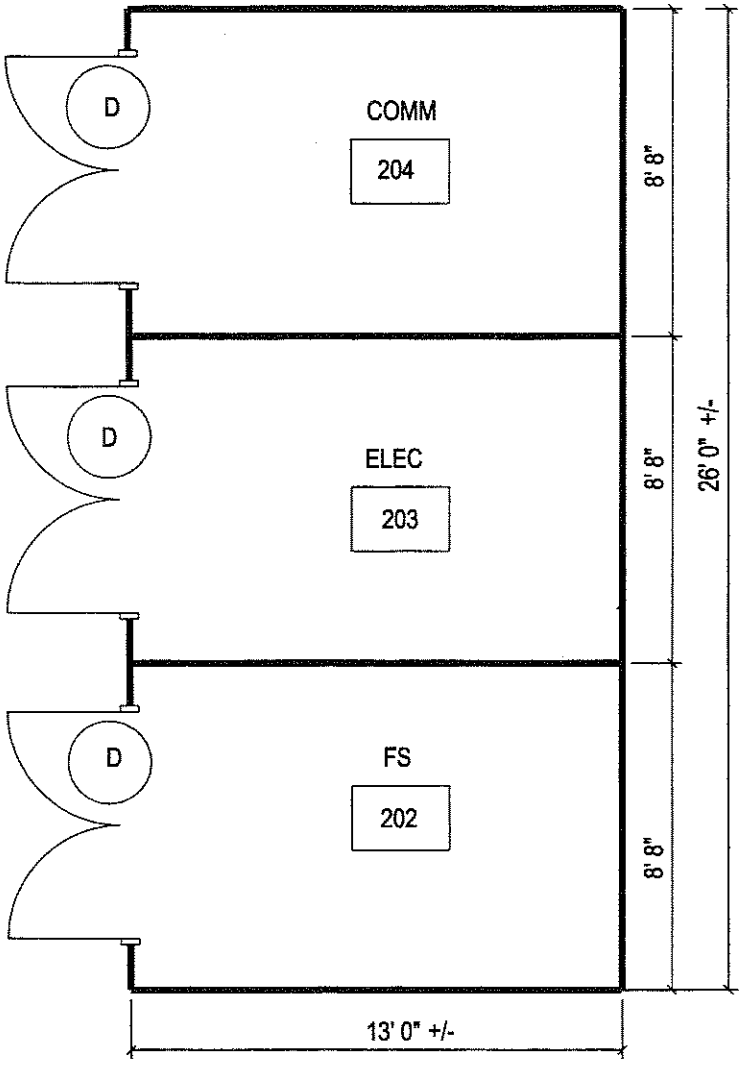
TO BE FURNISHED BY OTHERS:
- EQUIPMENT
- TV CAMERAS
- WORKBENCHES

N

MECHANICAL RM.

4' 3' 2' 1' 0' 5' 10' 15'

EXPLOSIVE R&D LOADING FACILITY



space allotment

DOOR TYPE "E"

Double leaf to swing
180 Degree to outside

Equipment layout shall comply with the
manufacturer's recommended
clearances and required code clearances

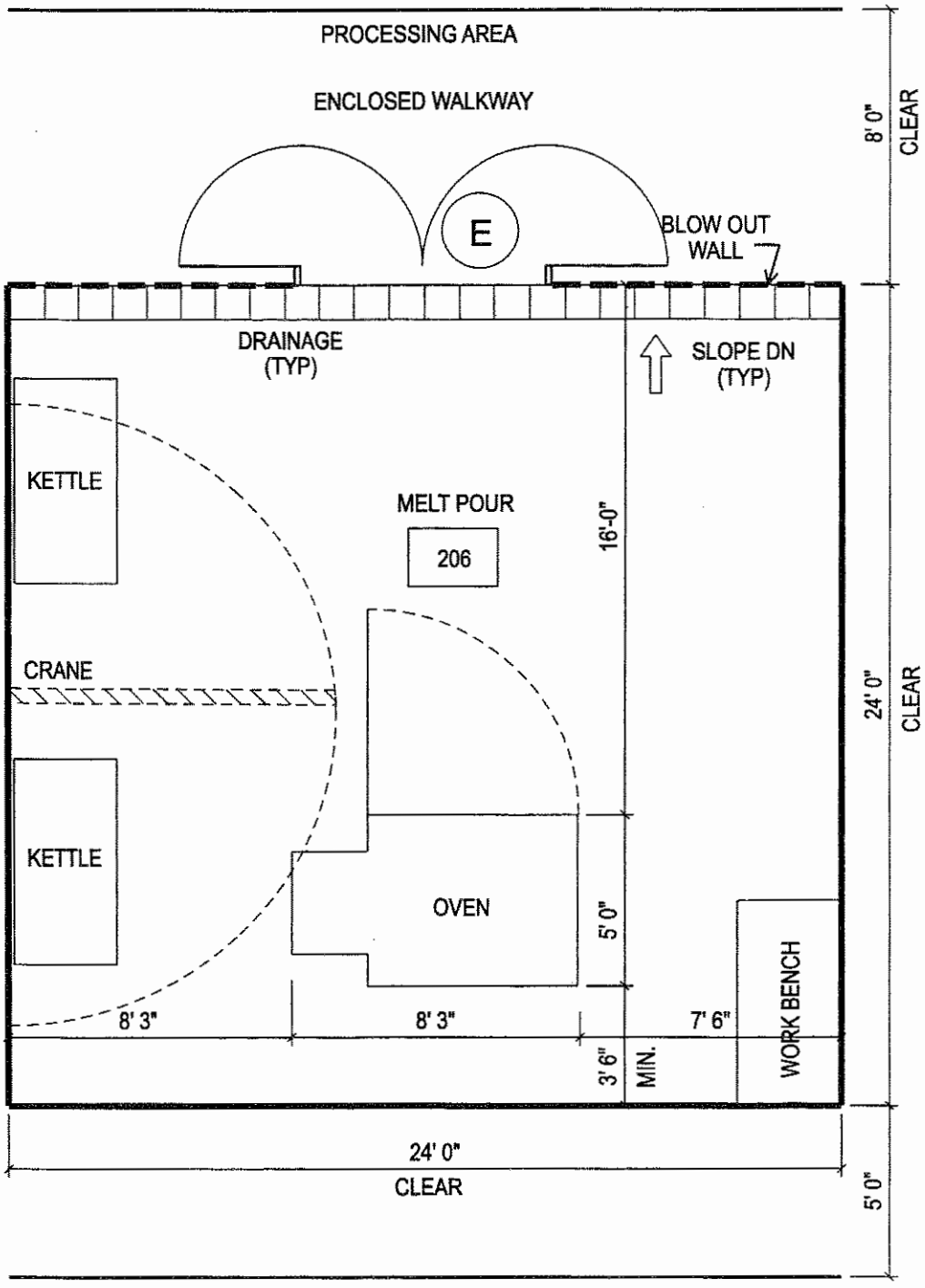
TO BE FURNISHED BY OTHERS:
- EQUIPMENT
- TV CAMERAS
- WORKBENCHES

N

COMMUNICATIONS, ELECTRICAL & FIRE/SPRINKLER

4' 3' 2' 1' 0' 5' 10' 15'

EXPLOSIVE R&D LOADING FACILITY



DOOR TYPE "E"

Double leaf to swing
180 Degree to outside

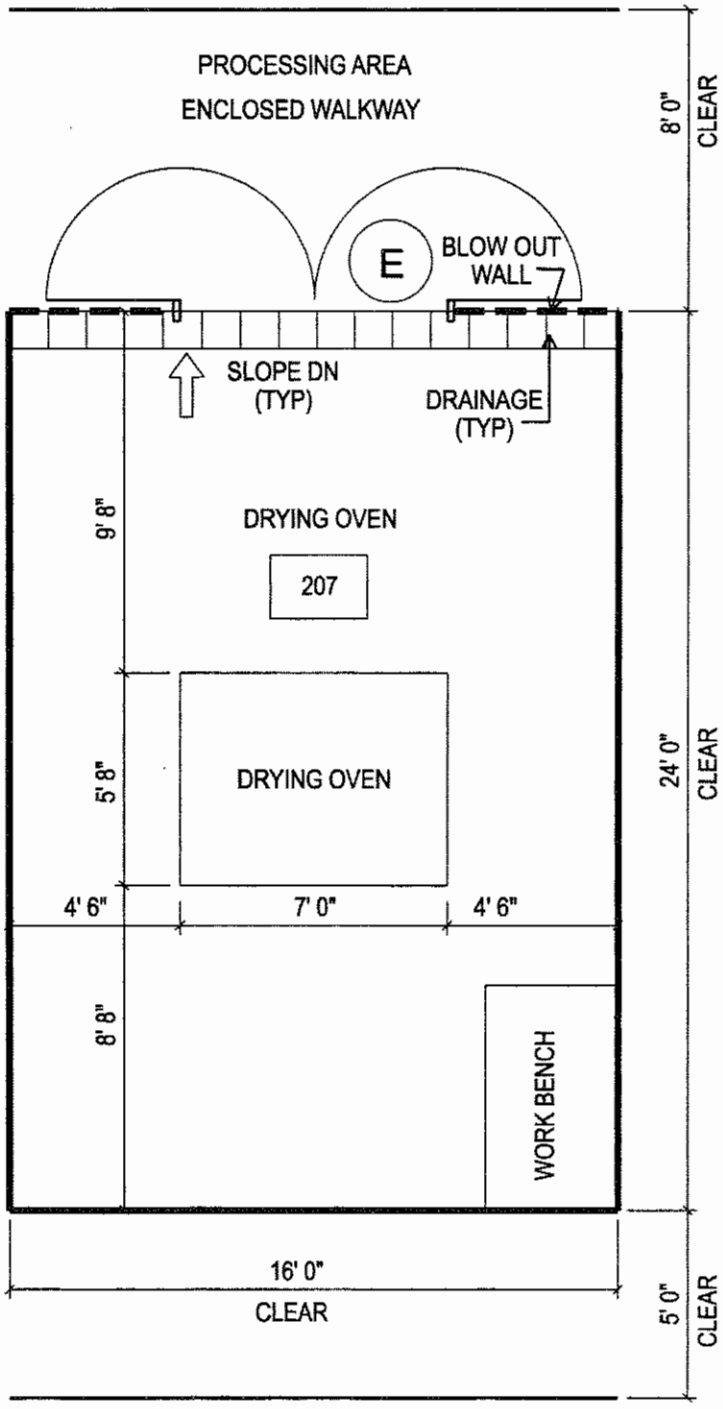
TO BE FURNISHED BY OTHERS:
- EQUIPMENT
- TV CAMERAS
- WORKBENCHES

N

MELT POUR

4' 3' 2' 1' 0' 5' 10' 15'

EXPLOSIVE R&D LOADING FACILITY



DOOR TYPE "E"

Double leaf to swing
180 Degree to outside

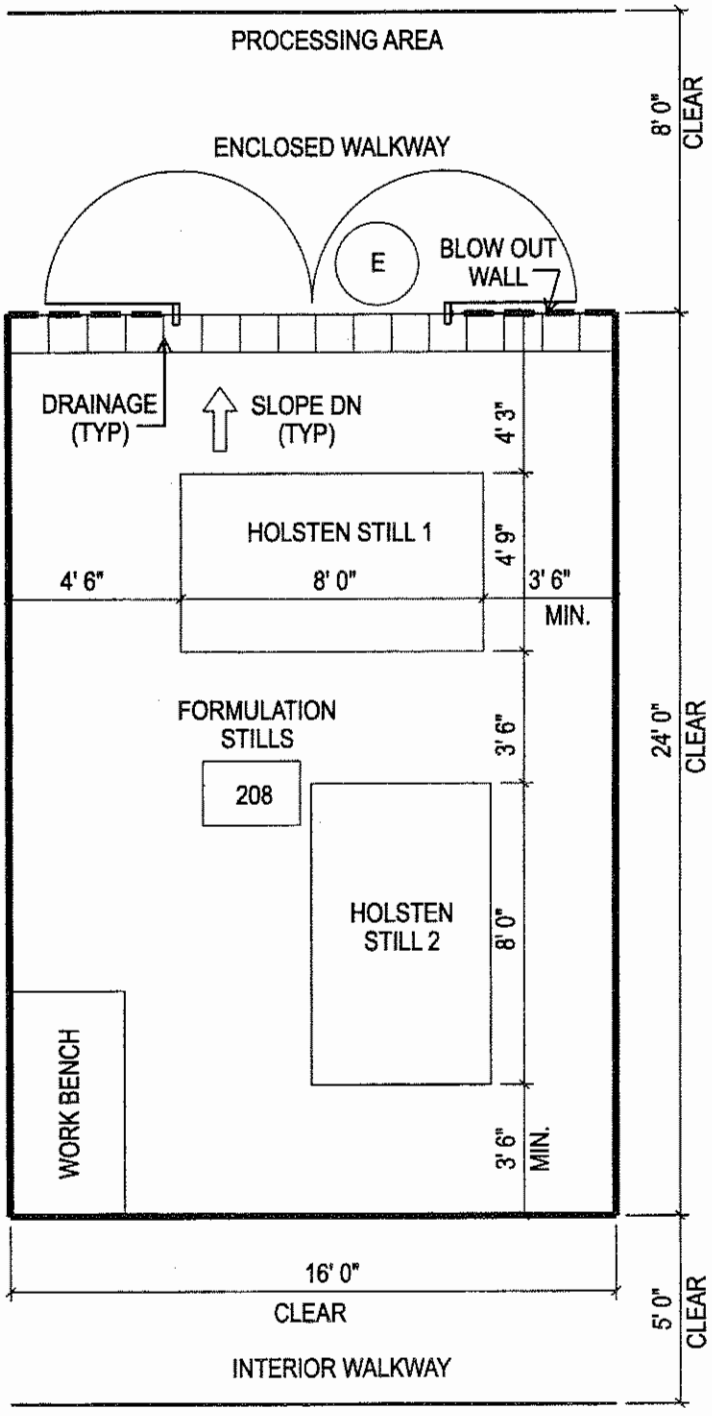
TO BE FURNISHED BY OTHERS:
- EQUIPMENT
- TV CAMERAS
- WORKBENCHES

N

DRYING OVEN

4' 3' 2' 1' 0' 5' 10' 15'

EXPLOSIVE R&D LOADING FACILITY



DOOR TYPE "E"

Double leaf to swing
180 Degree to outside

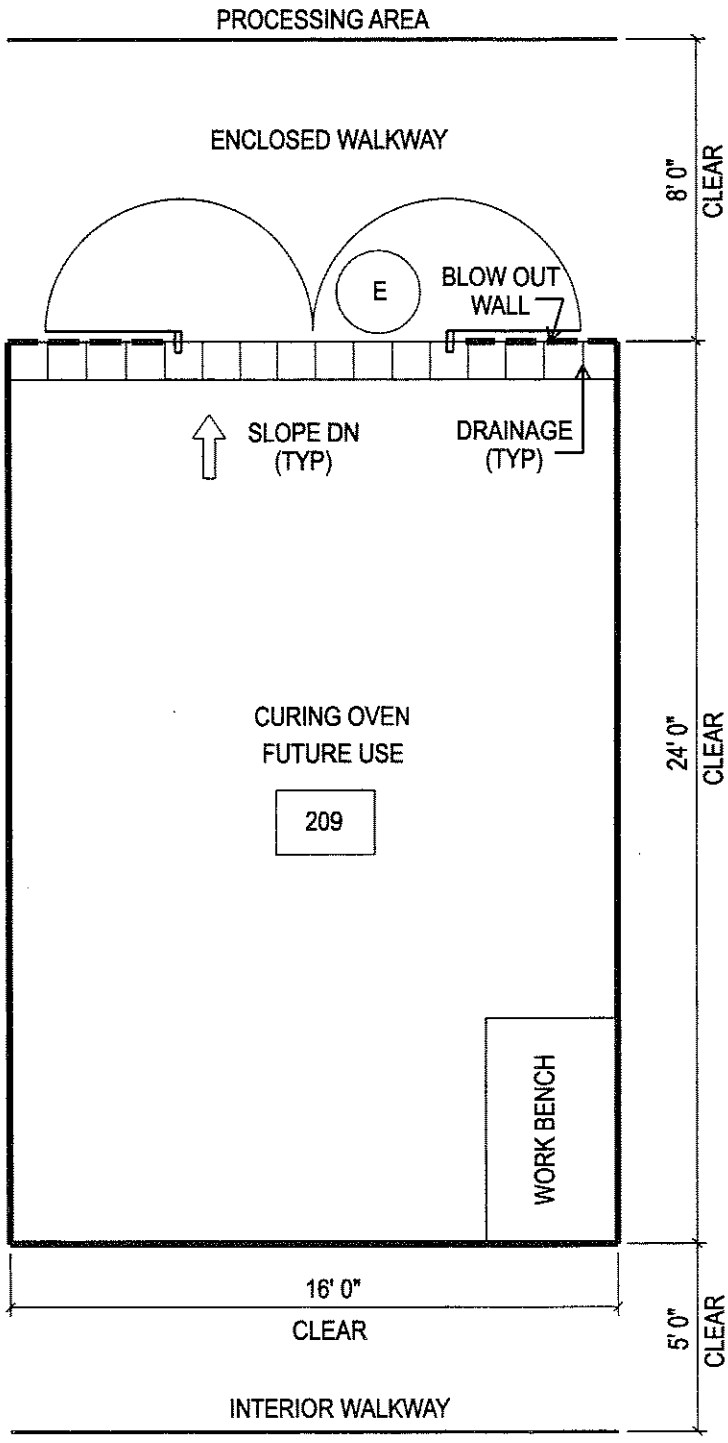
TO BE FURNISHED BY OTHERS:
- EQUIPMENT
- TV CAMERAS
- WORKBENCHES

N

HOLSTEIN STILLS

4' 3' 2' 1' 0' 5' 10' 15'

EXPLOSIVE R&D LOADING FACILITY



DOOR TYPE "E"

Double leaf to swing
180 Degree to outside

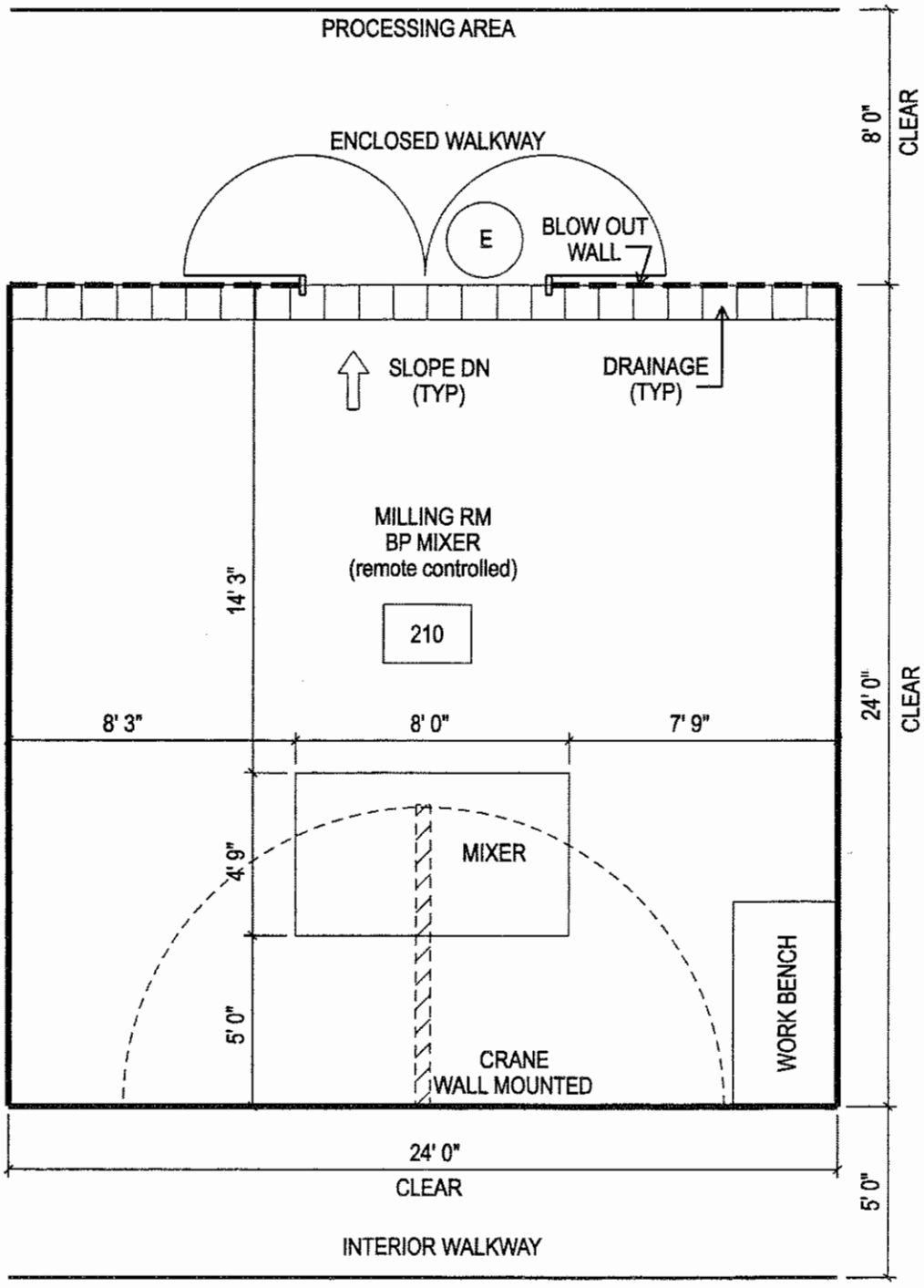
TO BE FURNISHED BY OTHERS:
- EQUIPMENT
- TV CAMERAS
- WORKBENCHES

N

CURING OVEN

4' 3' 2' 1' 0' 5' 10' 15'

EXPLOSIVE R&D LOADING FACILITY



DOOR TYPE "E"

Double leaf to swing
180 Degree to outside

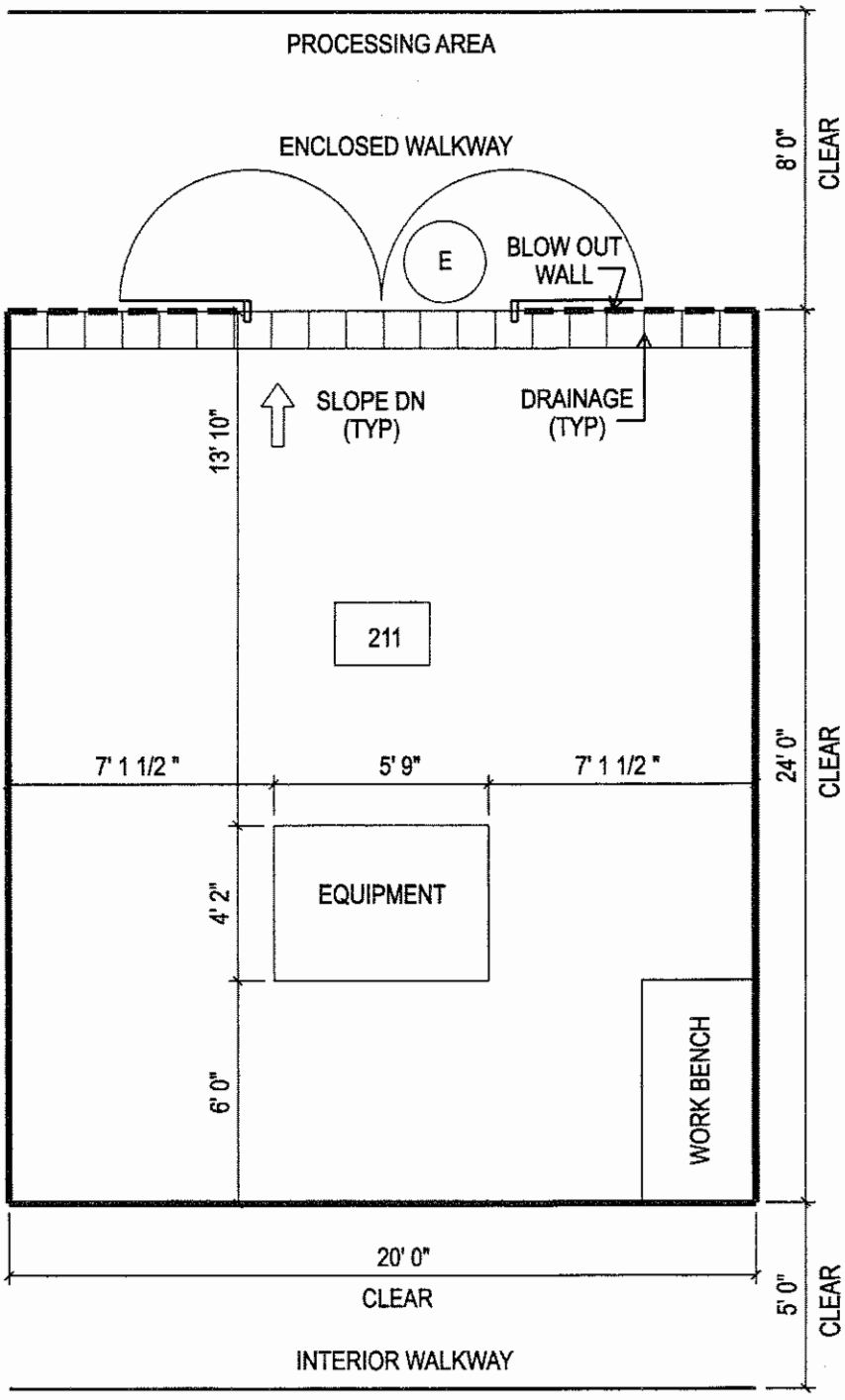
TO BE FURNISHED BY OTHERS:
- EQUIPMENT
- TV CAMERAS
- WORKBENCHES

N

MILLING RM

4' 3' 2' 1' 0' 5' 10' 15'

EXPLOSIVE R&D LOADING FACILITY



DOOR TYPE "E"

Double leaf to swing
180 Degree to outside

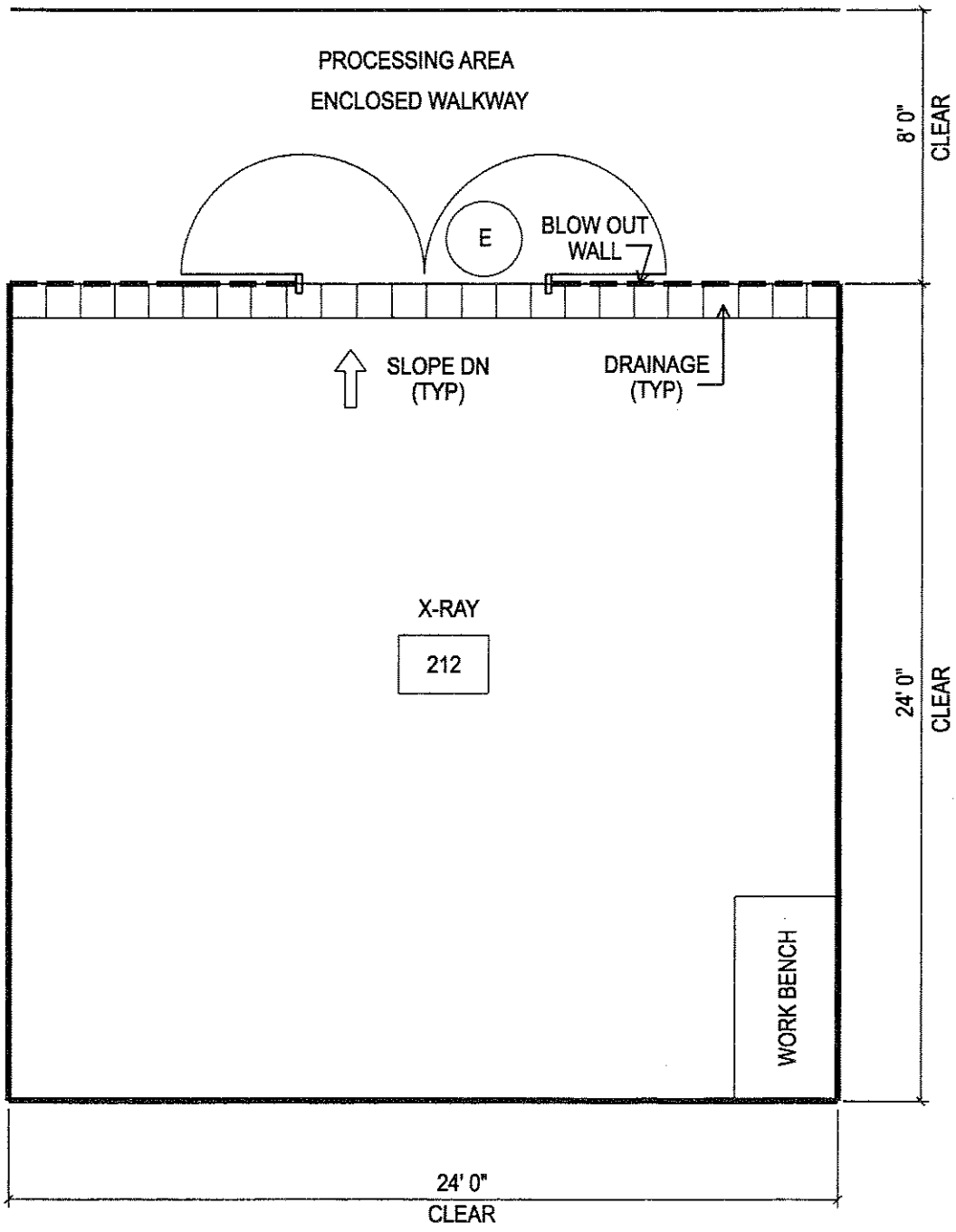
TO BE FURNISHED BY OTHERS:
- EQUIPMENT
- TV CAMERAS
- WORKBENCHES

N

ROTARY PRESS

4' 3' 2' 1' 0' 5' 10' 15'

EXPLOSIVE R&D LOADING FACILITY



DOOR TYPE "E"

Double leaf to swing
180 Degree to outside

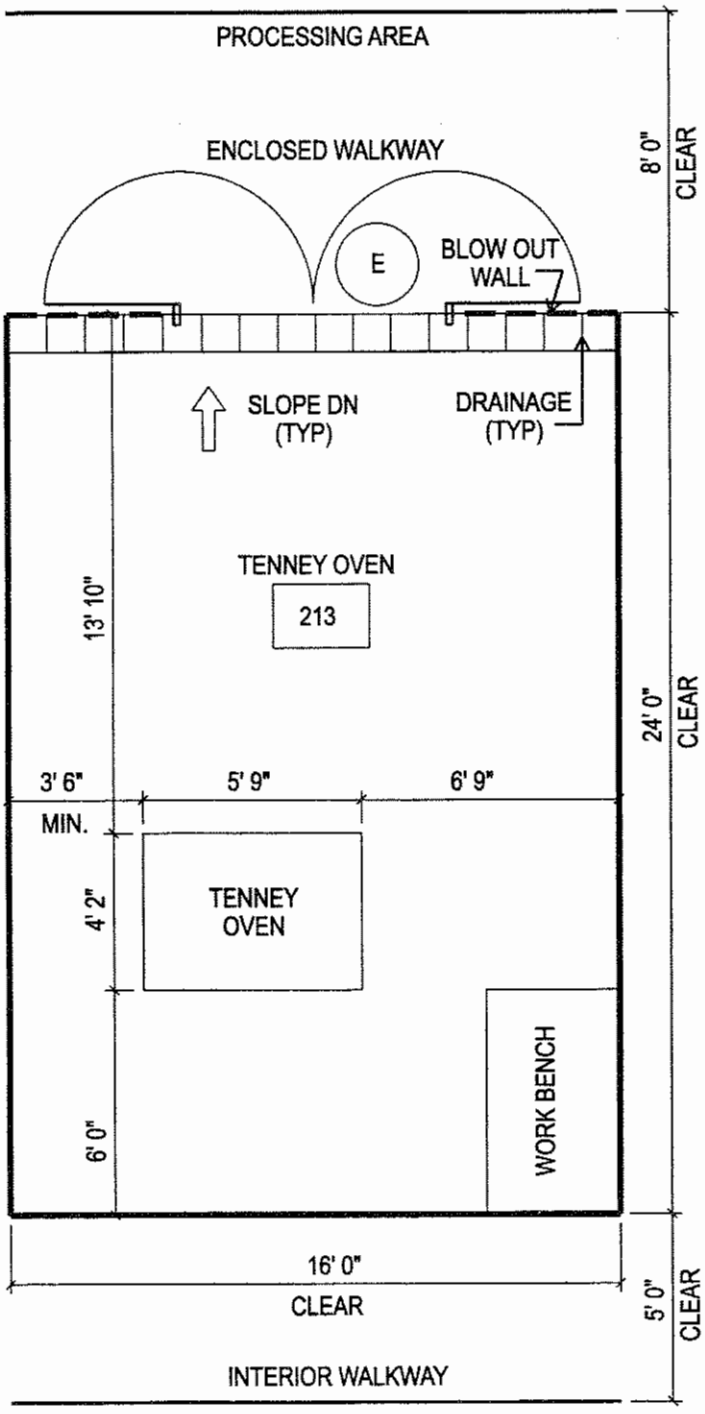
TO BE FURNISHED BY OTHERS:
- EQUIPMENT
- TV CAMERAS
- WORKBENCHES

N

X-RAY

4' 3' 2' 1' 0' 5' 10' 15'

EXPLOSIVE R&D LOADING FACILITY



DOOR TYPE "E"

Double leaf to swing
180 Degree to outside

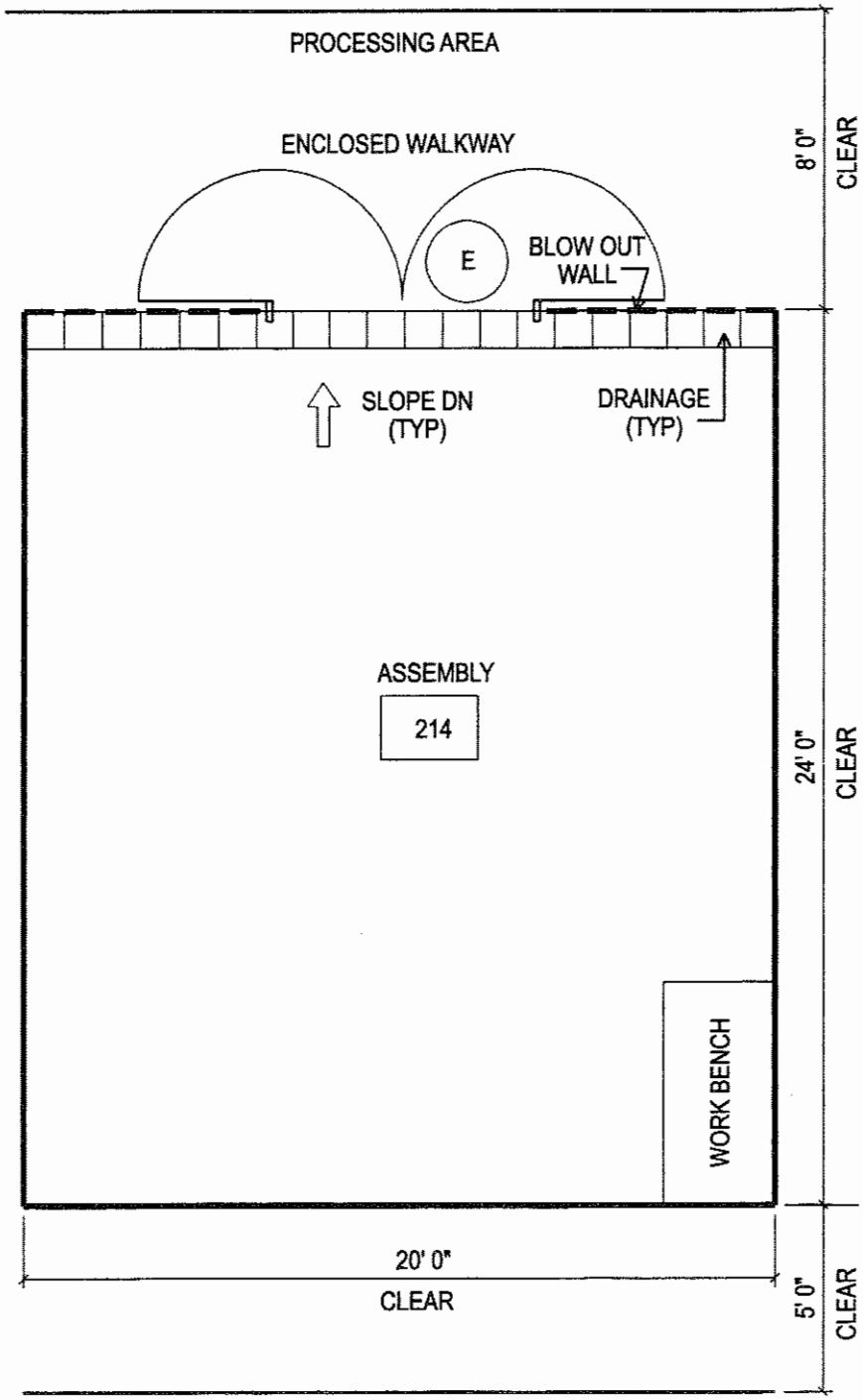
TO BE FURNISHED BY OTHERS:
- EQUIPMENT
- TV CAMERAS
- WORKBENCHES

N

TENNEY OVEN

4' 3' 2' 1' 0' 5' 10' 15'

EXPLOSIVE R&D LOADING FACILITY



DOOR TYPE "E"

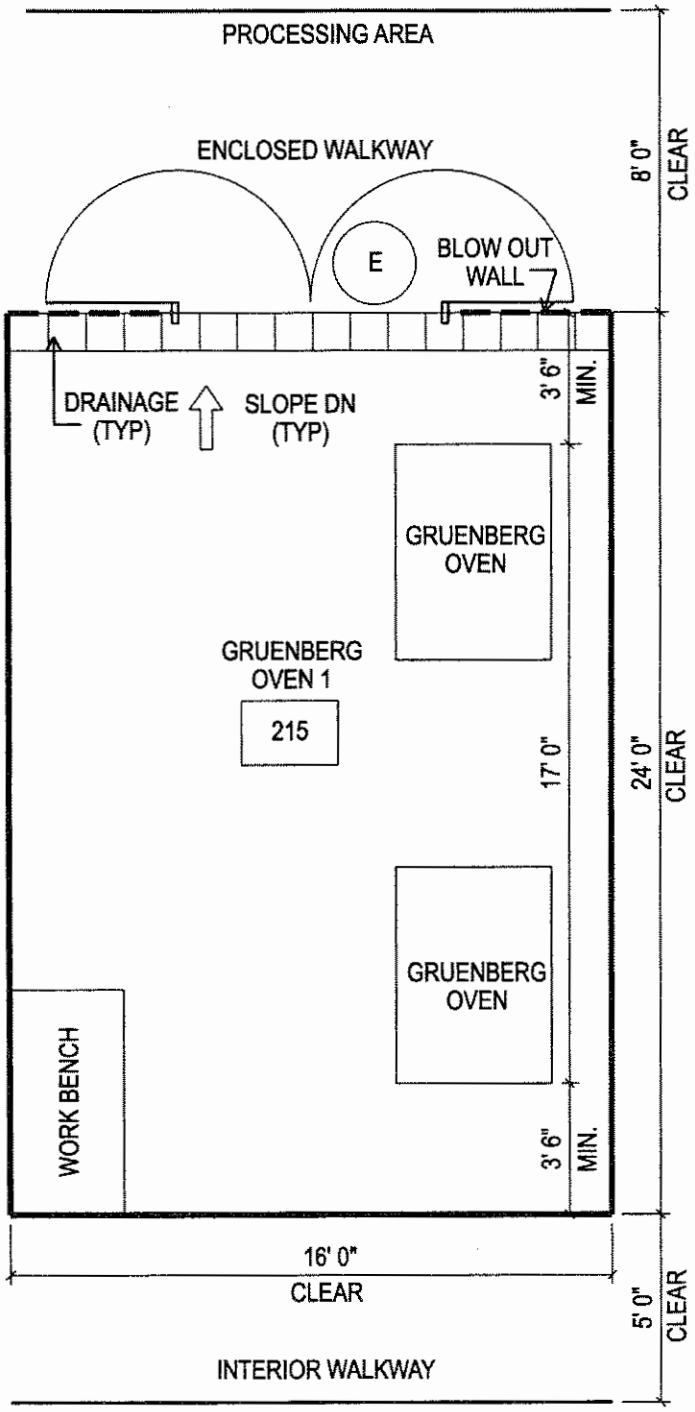
Double leaf to swing
180 Degree to outside

TO BE FURNISHED BY OTHERS:
- EQUIPMENT
- TV CAMERAS
- WORKBENCHES

ASSEMBLY

4' 3' 2' 1' 0' 5' 10' 15'

EXPLOSIVE R&D LOADING FACILITY



DOOR TYPE "E"

Double leaf to swing
180 Degree to outside

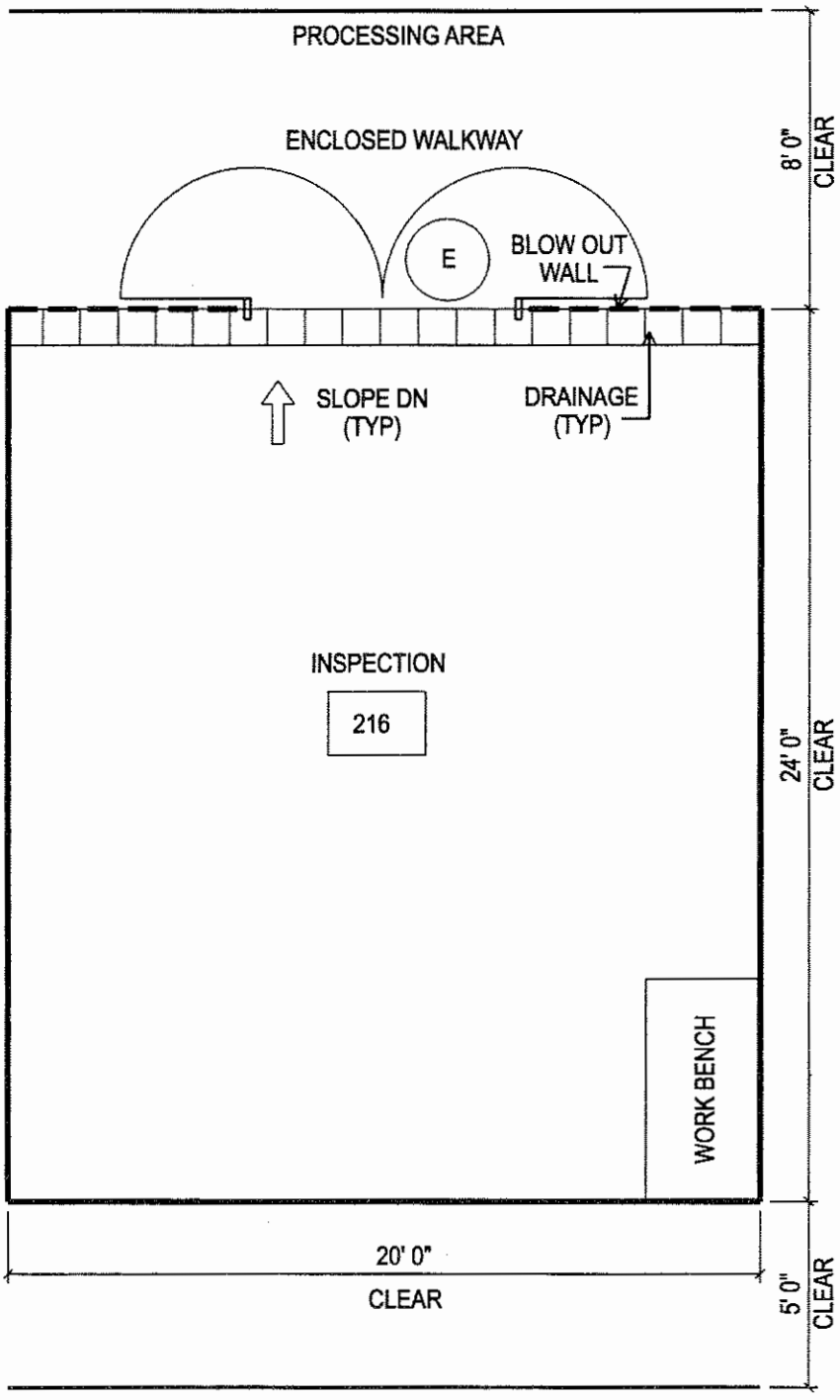
TO BE FURNISHED BY OTHERS:
- EQUIPMENT
- TV CAMERAS
- WORKBENCHES

N

GRUENBERG OVEN 1

4' 3' 2' 1' 0' 5' 10' 15'

EXPLOSIVE R&D LOADING FACILITY



DOOR TYPE "E"

Double leaf to swing
180 Degree to outside

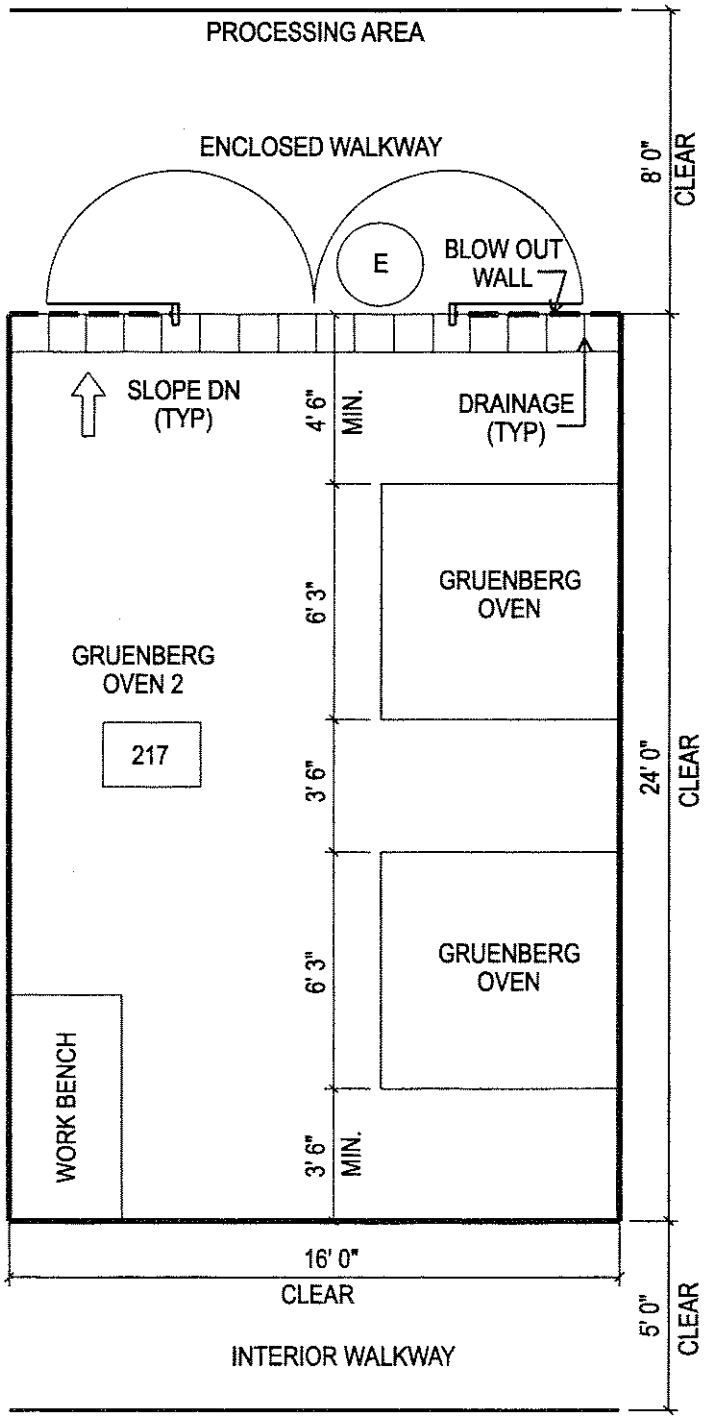
TO BE FURNISHED BY OTHERS:
- EQUIPMENT
- TV CAMERAS
- WORKBENCHES

N

INSPECTION

4' 3' 2' 1' 0' 5' 10' 15'

EXPLOSIVE R&D LOADING FACILITY



DOOR TYPE "E"

Double leaf to swing
180 Degree to outside

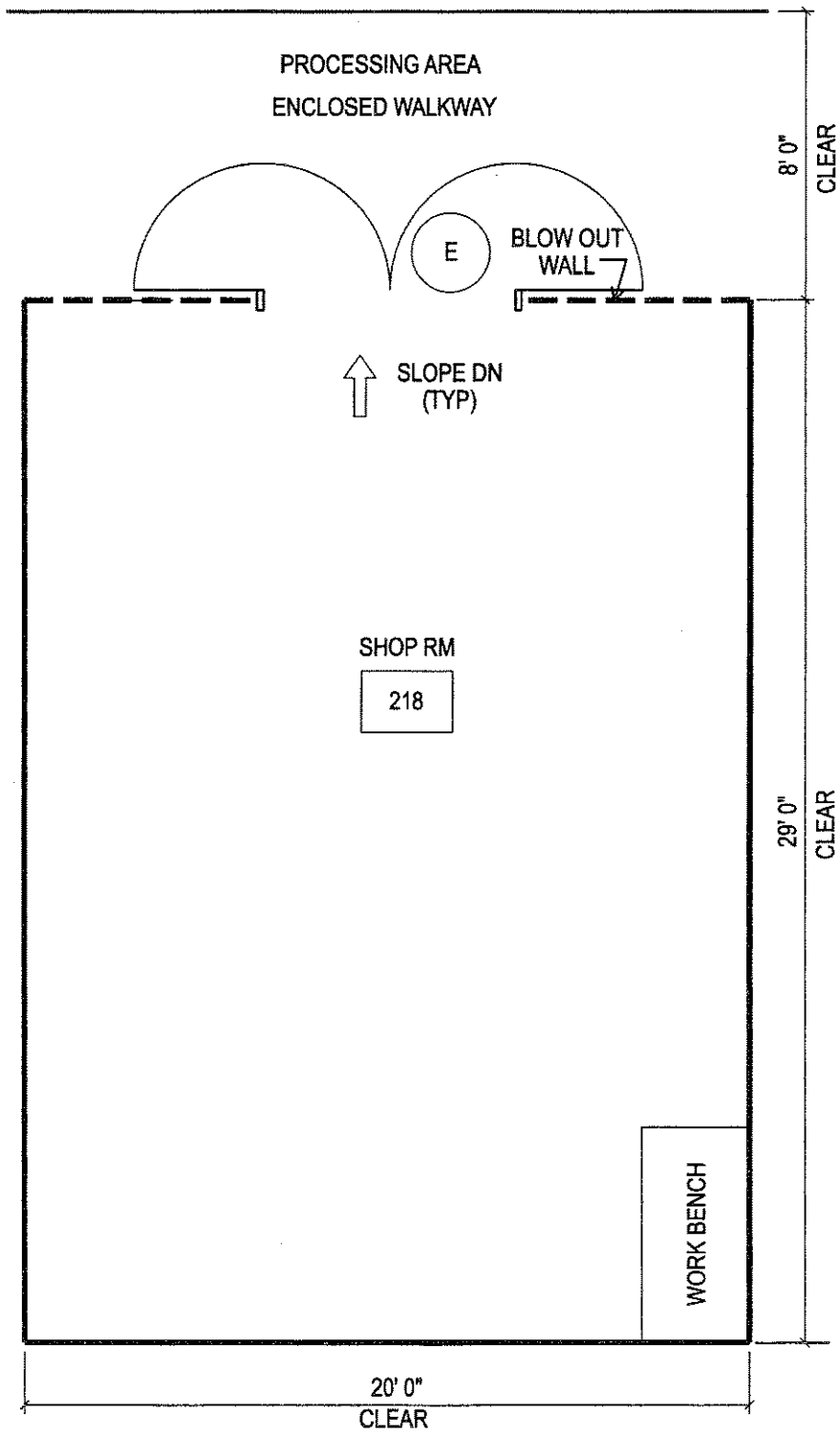
TO BE FURNISHED BY OTHERS:
- EQUIPMENT
- TV CAMERAS
- WORKBENCHES

N

GRUENBERG OVEN 2

4' 3' 2' 1' 0' 5' 10' 15'

EXPLOSIVE R&D LOADING FACILITY



DOOR TYPE "E"

Double leaf to swing
180 Degree to outside

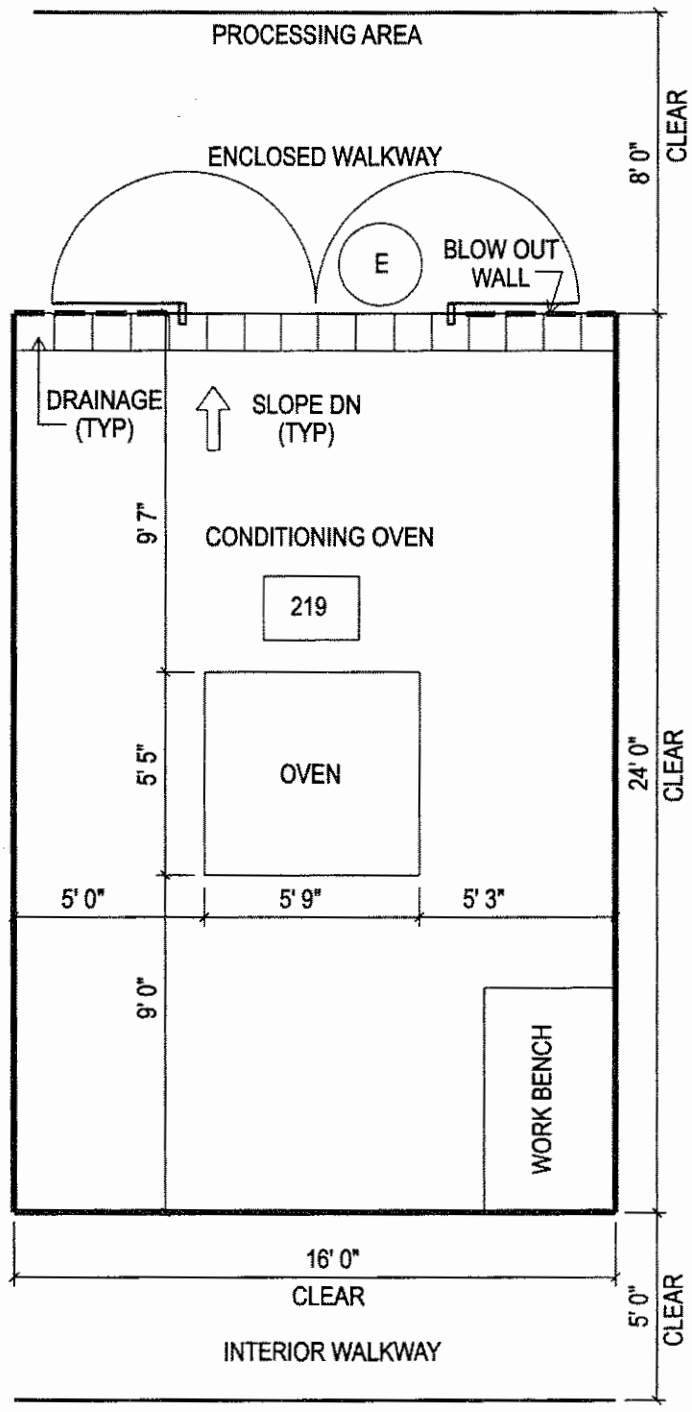
TO BE FURNISHED BY OTHERS:
- EQUIPMENT
- TV CAMERAS
- WORKBENCHES

N

SHOP ROOM

4' 3' 2' 1' 0' 5' 10' 15'

EXPLOSIVE R&D LOADING FACILITY



DOOR TYPE "E"

Double leaf to swing
180 Degree to outside

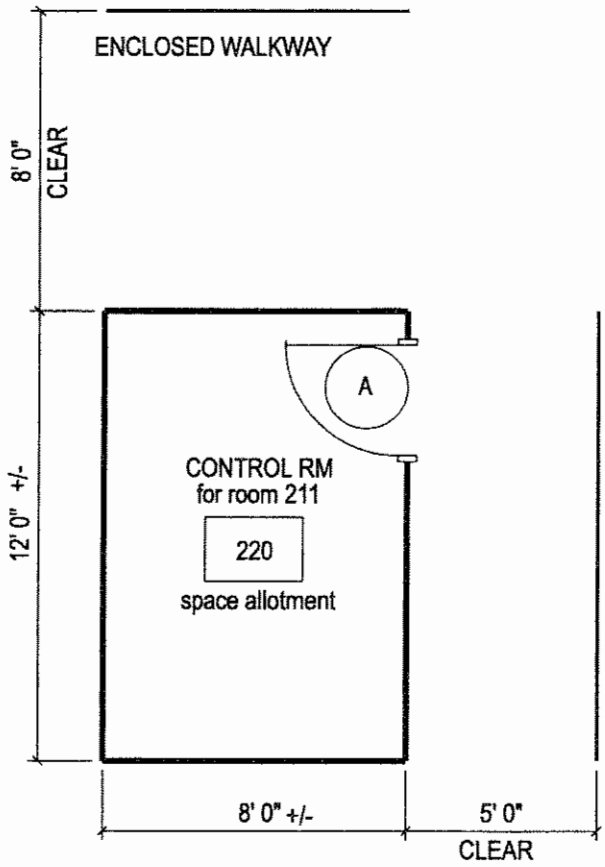
TO BE FURNISHED BY OTHERS:
- EQUIPMENT
- TV CAMERAS
- WORKBENCHES

N

CONDITIONING OVEN

4' 3' 2' 1' 0' 5' 10' 15'

EXPLOSIVE R&D LOADING FACILITY



DOOR TYPE "E"

Double leaf to swing
180 Degree to outside

Equipment layout shall comply with the manufacturer's recommended clearances and required code clearances

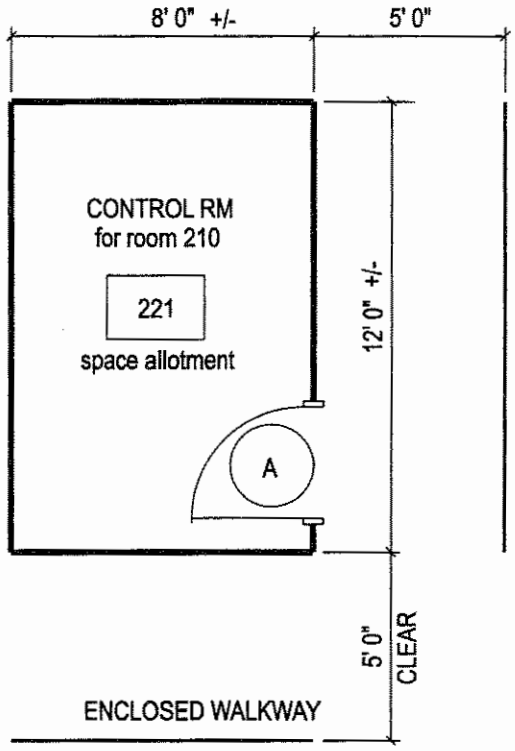
TO BE FURNISHED BY OTHERS:
- EQUIPMENT
- TV CAMERAS
- WORKBENCHES

N

CONTROL ROOM

4' 3' 2' 1' 0' 5' 10' 15'

EXPLOSIVE R&D LOADING FACILITY



DOOR TYPE "E"

Double leaf to swing
180 Degree to outside

Equipment layout shall comply with the
manufacturer's recommended
clearances and required code clearances

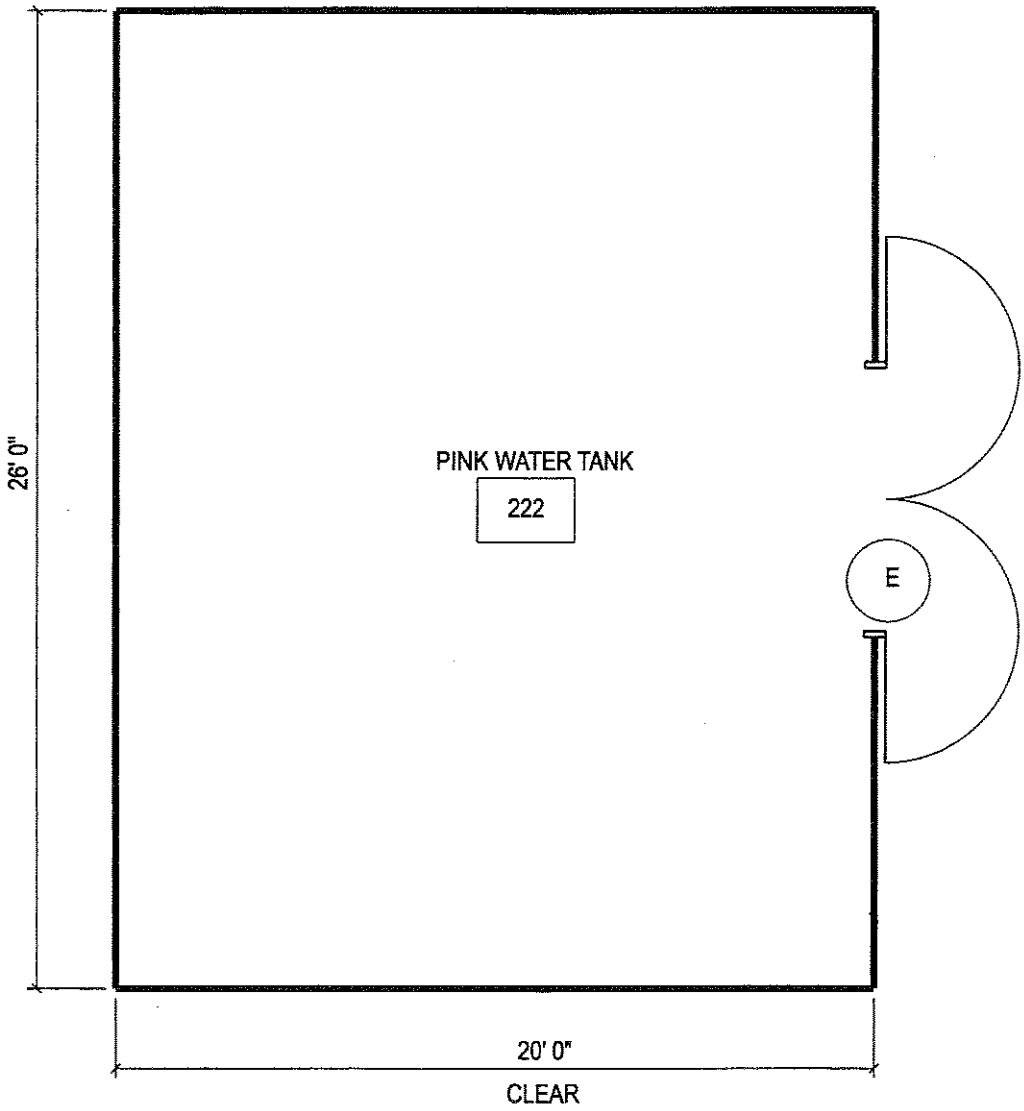
TO BE FURNISHED BY OTHERS:
- EQUIPMENT
- TV CAMERAS
- WORKBENCHES

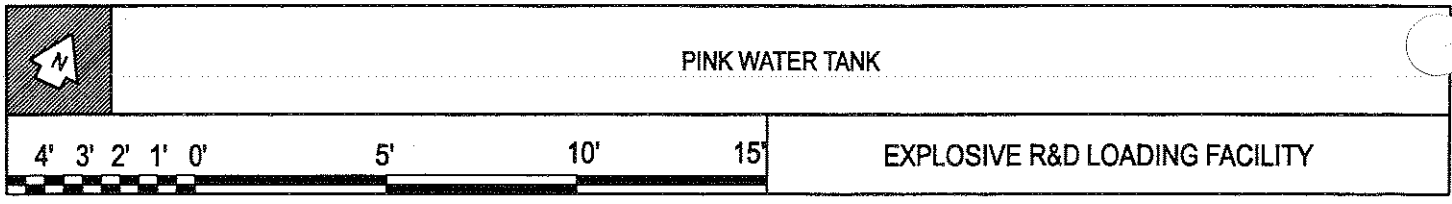
N

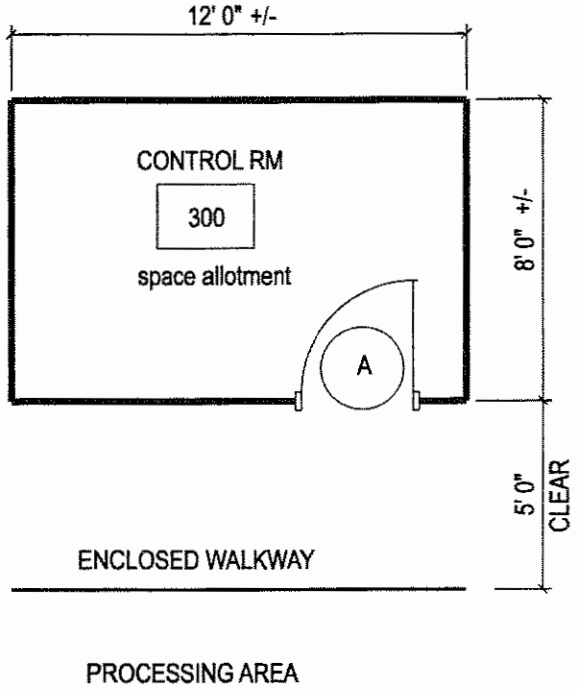
CONTROL ROOM

4' 3' 2' 1' 0' 5' 10' 15'

EXPLOSIVE R&D LOADING FACILITY


26' 0"
PINK WATER TANK
222
E
20' 0"
CLEAR


N
PINK WATER TANK
4' 3' 2' 1' 0'
5'
10'
15'
EXPLOSIVE R&D LOADING FACILITY



DOOR TYPE "E"

Double leaf to swing
180 Degree to outside

Equipment layout shall comply with the manufacturer's recommended clearances and required code clearances

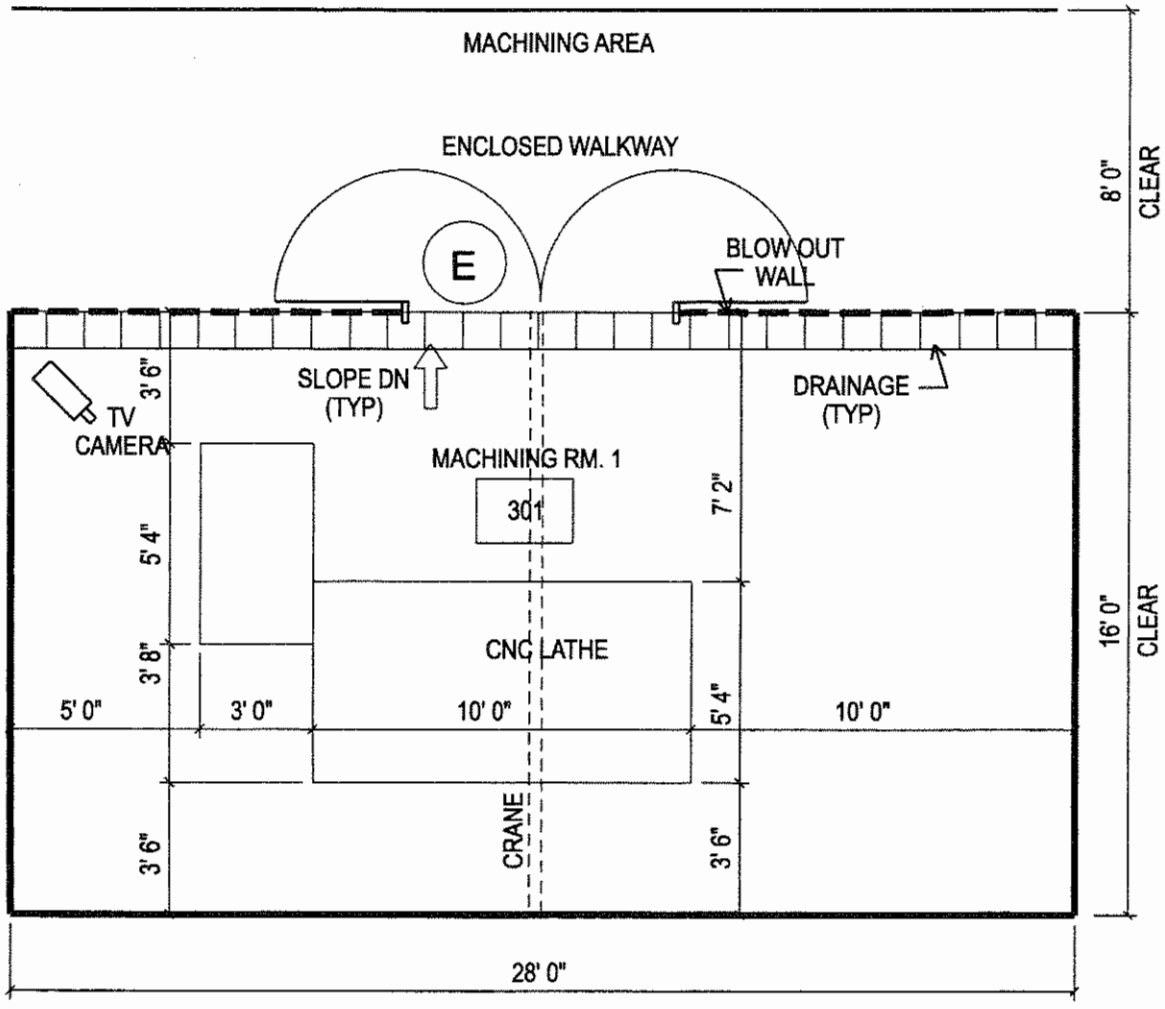
TO BE FURNISHED BY OTHERS:
- EQUIPMENT
- TV CAMERAS
- WORKBENCHES

N

CONTROL ROOM

4' 3' 2' 1' 0' 5' 10' 15'

EXPLOSIVE R&D LOADING FACILITY



DOOR TYPE "E"

Double leaf to swing
180 Degree to outside

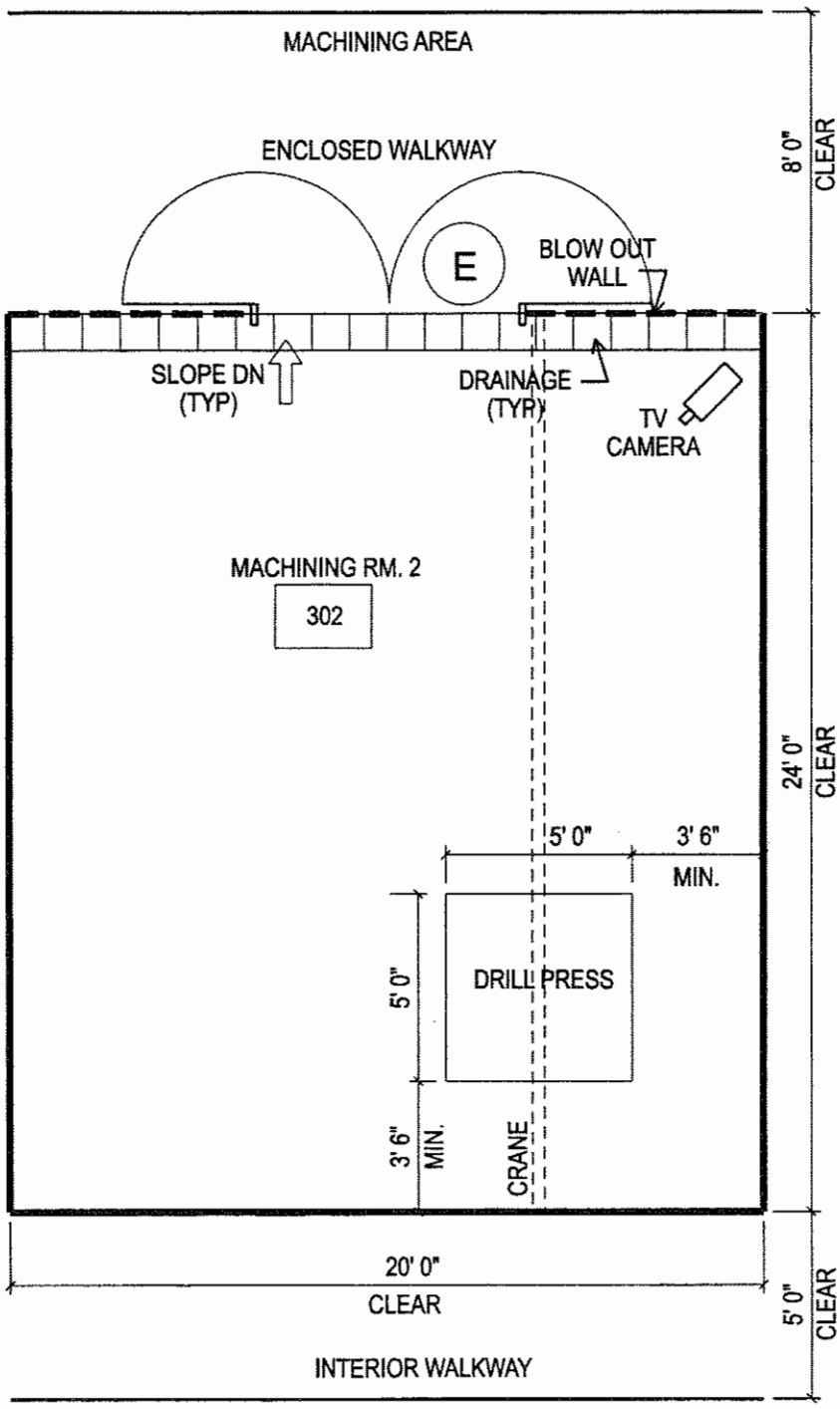
TO BE FURNISHED BY OTHERS:
- EQUIPMENT
- TV CAMERAS
- WORKBENCHES

N

CNC LATHE

4' 3' 2' 1' 0' 5' 10' 15'

EXPLOSIVE R&D LOADING FACILITY



DOOR TYPE "E"

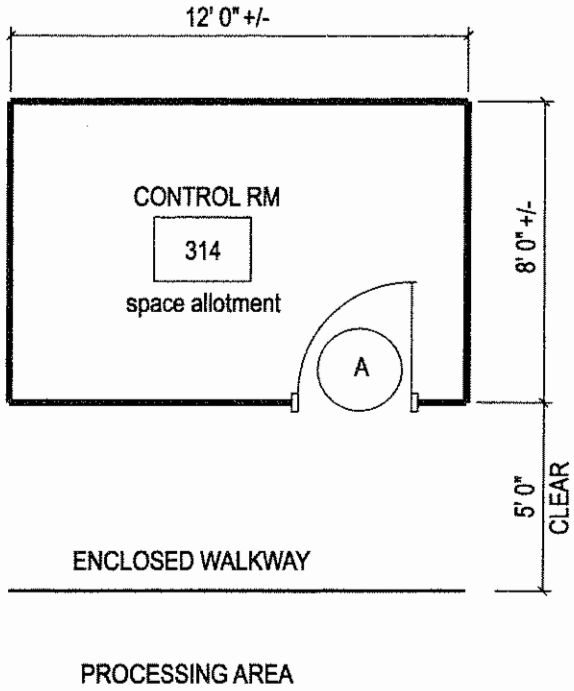
Double leaf to swing
180 Degree to outside

TO BE FURNISHED BY OTHERS:
- EQUIPMENT
- TV CAMERAS
- WORKBENCHES

DRILL PRESS SHOP

4' 3' 2' 1' 0' 5' 10' 15'

EXPLOSIVE R&D LOADING FACILITY



DOOR TYPE "E"

Double leaf to swing
180 Degree to outside

Equipment layout shall comply with the manufacturer's recommended clearances and required code clearances

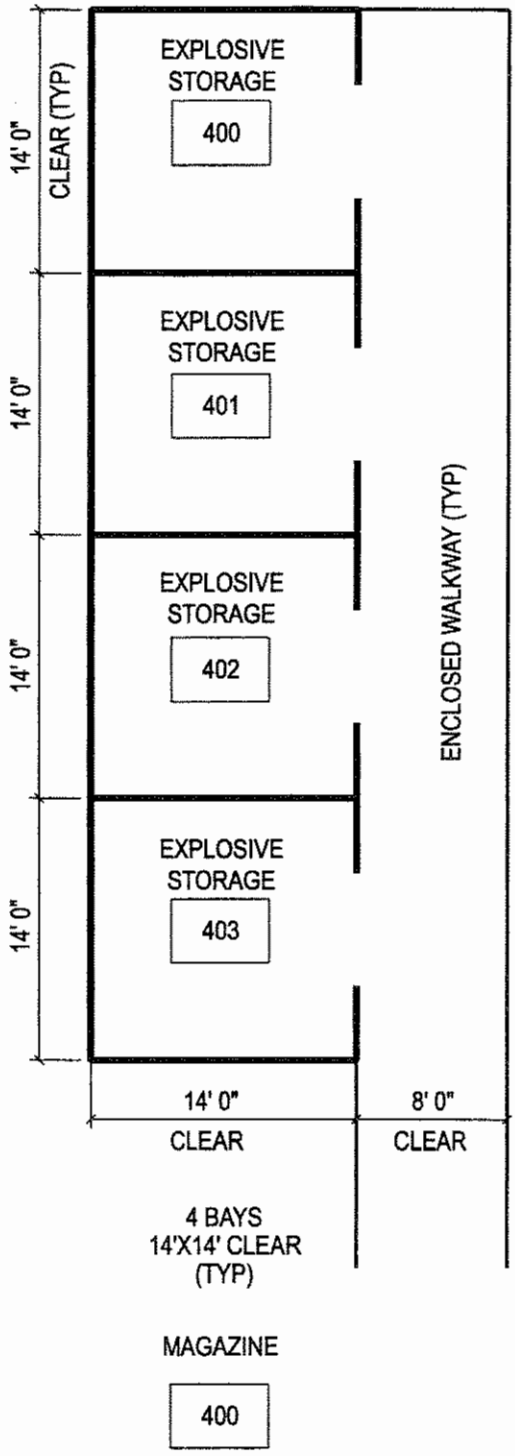
TO BE FURNISHED BY OTHERS:
- EQUIPMENT
- TV CAMERAS
- WORKBENCHES

N

CONTROL ROOM

4' 3' 2' 1' 0' 5' 10' 15'

EXPLOSIVE R&D LOADING FACILITY



MAGAZINE (TYP)

4' 3' 2' 1' 0' 5' 10' 15'

EXPLOSIVE R&D LOADING FACILITY

ATTACHMENT O

http://www.mantech-mec.com:8500/army_ids/index.cfm

ATTACHMENT P

NOT USED

ATTACHMENT Q

DRAWING INDEX

The following drawings are included with this RFP package:

T-1	TITLE SHEET
T-2	INDEX OF DRAWINGS
T-3	GENERAL PLAN
C-1	SITE PLAN
C-2	SITE PLAN
C-3	SITE PLAN
SU-1	TOPOGRAPHIC SURVEY
SU-2	TOPOGRAPHIC SURVEY
SU-3	TOPOGRAPHIC SURVEY
SU-4	TOPOGRAPHIC SURVEY
RC-1	REFERENCE DRAWING (WATER AND SEWER PLAN)
RC-2	REFERENCE DRAWING (STEAM LINES)
RC-3	REFERENCE DRAWINGS (WETLANDS DELINEATION PLAN)

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
NEW YORK DISTRICT

REQUEST FOR PROPOSAL
DESIGN BUILD
PN 49472

EXPLOSIVE RESEARCH DEVELOPMENT AND LOADING FACILITY
FY 04

PICATINNY ARMAMENT RESEARCH DEVELOPMENT AND ENGINEERING CENTER
DOVER, NEW JERSEY

SOLICITATION NO. W912DS-04-R-0006

US Army Corps of Engineers
New York District

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
NEW YORK, NEW YORK

DESIGNED BY: TARAN
DATE: MAY 2004
DRAWN BY: SAB
CKD BY:
REVIEWED BY:
SUBMITTED BY:
DRAWING CODE:
DRAWING FILE NO:
PLOT DATE:
PLOT BY:
PLOT SCALE:

EXPLOSIVE RESEARCH DEVELOPMENT AND LOADING FACILITY
PN 49472
PICATINNY, NEW JERSEY

TITLE SHEET

SHEET REFERENCE NUMBER:
T-1

INDEX OF DRAWINGS

SHEET NO.	SHEET REF. NO.	TITLE	SHEET NO.	SHEET REF. NO.	TITLE	SHEET NO.	SHEET REF. NO.	TITLE
		ERDLF						
T-1		TITLE SHEET						
T-2		INDEX OF DRAWINGS						
T-3		GENERAL PLAN						
		CIVIL						
C-1		SITE PLAN						
C-2		SITE PLAN						
C-3		SITE PLAN						
		TOPOGRAPHIC SURVEY						
SU-1		TOPOGRAPHIC SURVEY						
SU-2		TOPOGRAPHIC SURVEY						
SU-3		TOPOGRAPHIC SURVEY						
SU-4		TOPOGRAPHIC SURVEY						
		REFERENCE DRAWINGS						
RC-1		WATER & SEWER PLAN						
RC-2		STEAM LINES						
RC-3		WETLANDS DELINEATION PLAN						

US Army Corps of Engineers
New York District

SYMBOL	DESCRIPTION	DATE	APPR

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
NEW YORK, NEW YORK

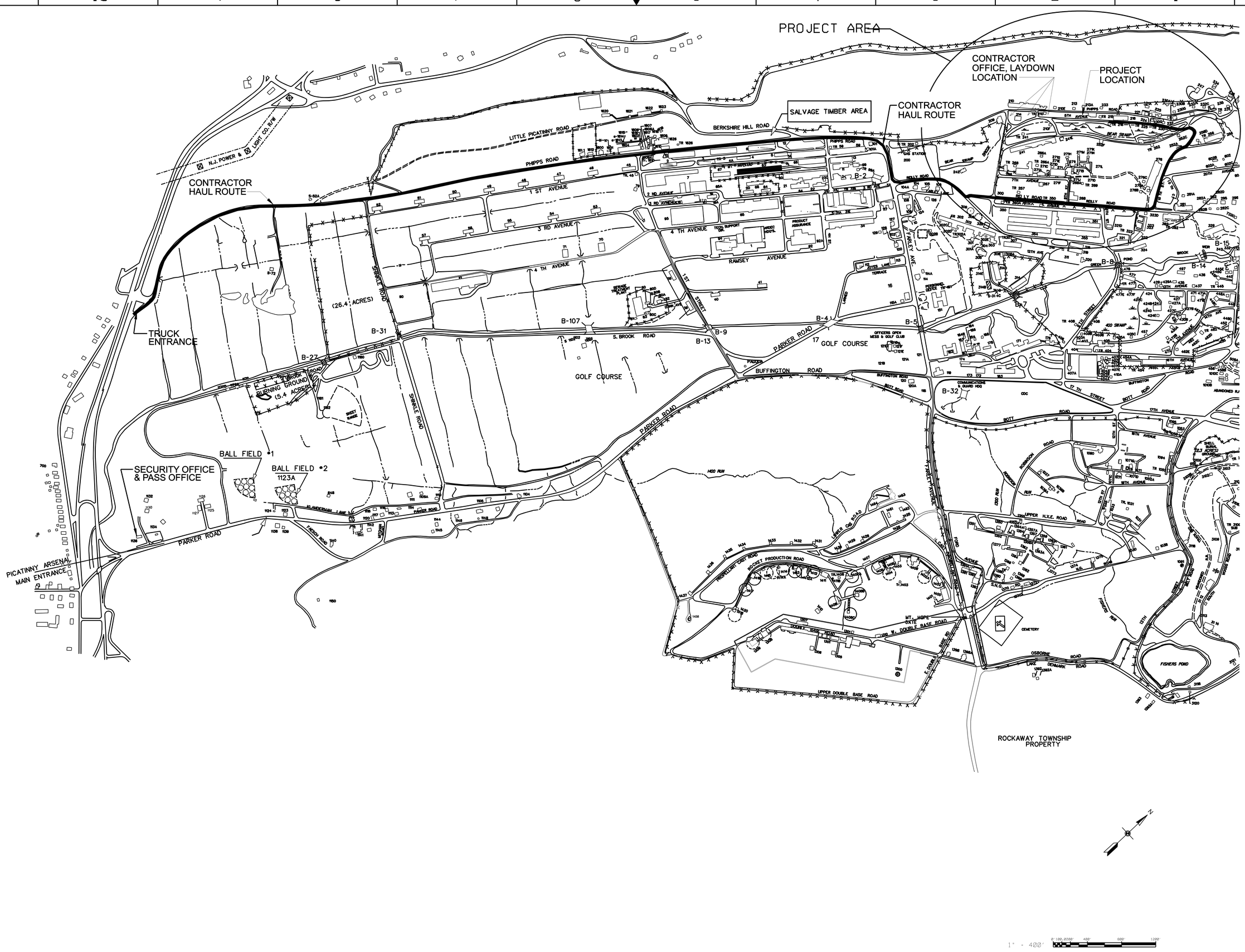
DESIGNED BY: TARAN
DATE: MAY 2012
SIZE(ANSI): A1
DWN BY: SAG
CKD BY:
DRAWING CODE:
REVIEWED BY:
DRAWING FILE NO.:
SUBMITTED BY:
PLOT ON NYTIMES
PLOT BY HUGERUNNER
SCALE: FULL

* CLIE NAME & FIDELIDOS

PN 49472
EXPLOSIVE RESEARCH, DEVELOPMENT AND LOADING FACILITY
PICATINNY, NEW JERSEY

INDEX OF DRAWINGS

SHEET REFERENCE NUMBER:
T-2



US Army Corps of Engineers
New York District

SYMBOL	DESCRIPTION	DATE	APPR.

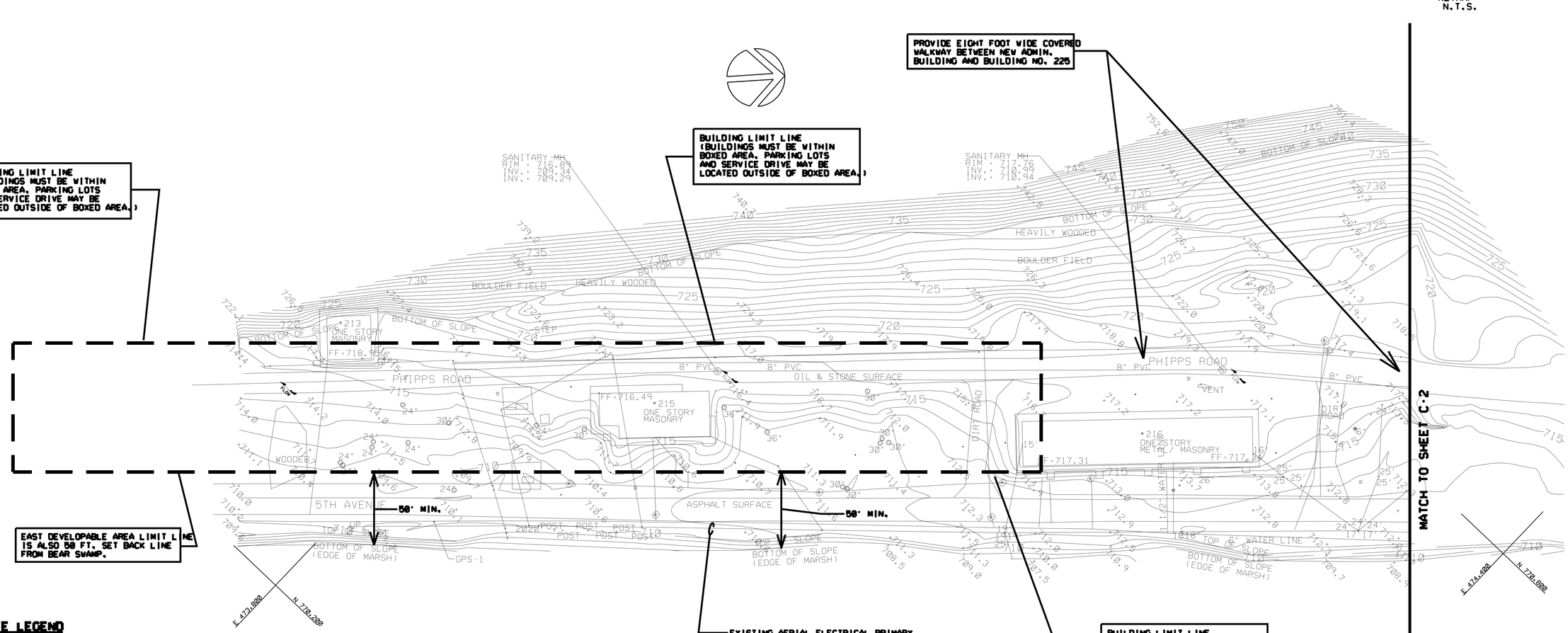
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
NEW YORK, NEW YORK

DESIGNED BY: TARAN | DATE: 14 MAY 2004 | CHECKED BY:
DWN BY: SAG | CKD BY: | REVIEWED BY: | SUBMITTED BY:
DRAWING FILE NO.:
DRAWING CODE:
PLOT SKALE: 1 INCH
PLOT BY: MICROSTATION
FILE NAME: PROJECT.DGN

PN 45472
EXPLOSIVE RESEARCH, DEVELOPMENT AND LOADING FACILITY
PICATINNY, NEW JERSEY

GENERAL PLAN

SHEET REFERENCE NUMBER:
T-3



KEYMAP
N.T.S.

SITE LEGEND

UP	UTILITY POLE
24"	DECIDUOUS TREE
24"	EVERGREEN TREE
	WATER VALVE
	FIRE HYDRANT
	MONITOR WELL / TEST PIT / BORINGS
*710.8	SPOT ELEVATION
	STEAM SUPPORT POLE
*GPS-1	CONTROL
	VENT
S	SANITARY MANHOLE
GUY POLE	GUY POLE
	CATCH BASIN
	UTILITY MANHOLE
FLAG POLE	FLAG POLE
	SIGN
	STEAM LINE
	SANITARY LINE
	WATER LINE
	UNDERGROUND ELECTRIC LINE
	AERIAL ELECTRIC LINE
	STORM DRAINAGE LINE
	GAS LINE
	FENCE
*213 ONE STORY MASONRY	BUILDING

GENERAL ELECTRICAL DEMOLITION NOTE:

ANY REMAINING UTILITY POLES, SERVICE DROPS, OR STREET LIGHTING CIRCUITS PROJECTING INTO PROJECT LIMITS, SHALL BE REMOVED. (SECONDARIES TO BE REMOVED BACK TO AERIAL LINES ALONG 5TH AVENUE). SEE CIVIL SOW FOR DESCRIPTION OF PROJECTED DEMOLITION OF SITE BY PICATINNY PRIOR TO START OF CONSTRUCTION.

1" = 30'

US Army Corps of Engineers
New York District

SYMBOL	DESCRIPTION	DATE	APPR.

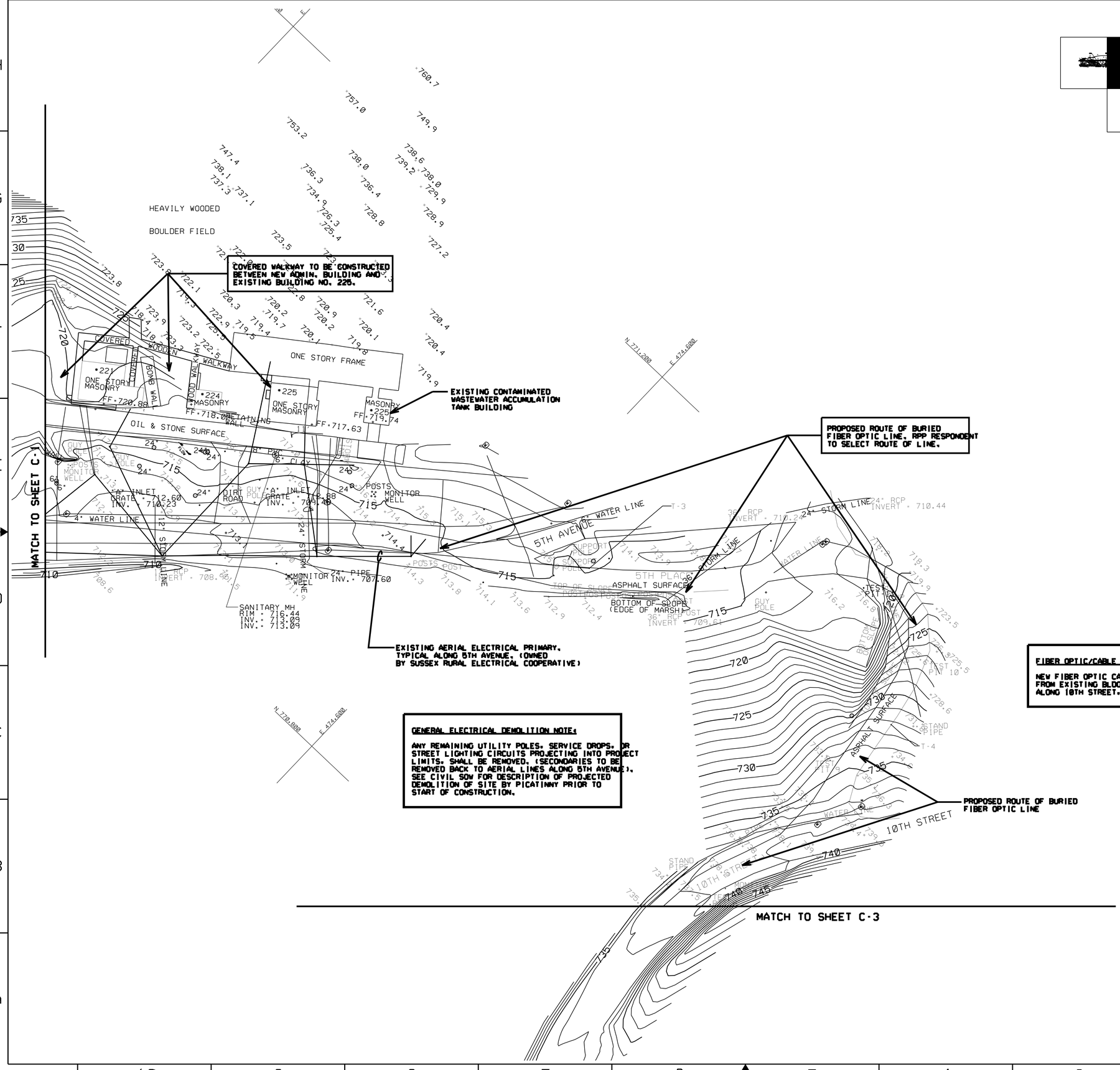
DESIGNED BY: TARAN
DATE: 14 MAY 2004
DWN BY: SAB
CKD BY:
REVIEWED BY:
SUBMITTED BY:
DRAWING CODE:
DRAWING FILE NO.:
PLOT DATE:
PLOT BY:
PLOT SCALE:

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
NEW YORK, NEW YORK

PN 49472
EXPLOSIVE RESEARCH, DEVELOPMENT AND LOADING FACILITY
PICATINNY, NEW JERSEY

SITE PLAN

SHEET REFERENCE NUMBER:
C-1



KEYMAP
N.T.S.

GENERAL ELECTRICAL DEMOLITION NOTE:

ANY REMAINING UTILITY POLES, SERVICE DROPS, OR STREET LIGHTING CIRCUITS PROJECTING INTO PROJECT LIMITS, SHALL BE REMOVED. (SECONDARIES TO BE REMOVED BACK TO AERIAL LINES ALONG 5TH AVENUE). SEE CIVIL SOW FOR DESCRIPTION OF PROJECTED DEMOLITION OF SITE BY PICATINNY PRIOR TO START OF CONSTRUCTION.

FIBER OPTIC/CABLE ROUTING NOTE:

NEW FIBER OPTIC CABLE SHALL BE ROUTED FROM EXISTING BLDG. 3230 TO NEW FACILITY ALONG 10TH STREET, THEN 5TH AVENUE.

US Army Corps of Engineers
New York District

SYMBOL	DESCRIPTION	DATE	APPR.

U.S. ARMY ENGINEER DISTRICT, NEW YORK
CORPS OF ENGINEERS
NEW YORK, NEW YORK

DESIGNED BY: TARAN
DATE: MAY 2012
CHECKED BY:
DWN BY: SAB
CKD BY:
REVIEWED BY:
SUBMITTED BY:
DRAWING CODE:
DRAWING FILE NO.:
PLOT DATE/TIME:
PLOT BY:
FOR OFFICIAL USE ONLY

PN 49472
EXPLOSIVE RESEARCH, DEVELOPMENT AND LOADING FACILITY
PICATINNY, NEW JERSEY

SITE PLAN

SHEET REFERENCE NUMBER:
C-2

1" = 30'

MATCH TO SHEET C-2

PROPOSED ROUTE OF BURIED FIBER OPTIC LINE. FIBER OPTIC LINE TO BE BURIED IN SHOULDER (BEYOND PAVED AREA) OF ROADWAY. FIBER OPTIC LINE MAY CROSS PAVED AREA AS REQUIRED FOR EASE OF INSTALLATION.

KEYMAP
N.T.S.

FIBER OPTIC/CABLE ROUTING NOTE:

NEW FIBER OPTIC CABLE SHALL BE ROUTED FROM EXISTING BLDG. 323D TO NEW FACILITY ALONG 10TH STREET. THEN 5TH AVENUE.

COMMUNICATIONS BUILDING (TERMINATION POINT OF NEW FIBER OPTIC LINE)

US Army Corps of Engineers
New York District

SYMBOL	DESCRIPTION	DATE	APPR.

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
NEW YORK, NEW YORK

DESIGNED BY: TARAN
DWN BY: SAG
CKD BY:
REVIEWED BY:
SUBMITTED BY:
DATE: 14 MAY 2004
SIZE: 51"x34"
DRAWING FILE NO.:
DRAWING CODE:
PLOT DATE/TIME:
PLOT BY:
PLOT SCALE:
FILE NAME:

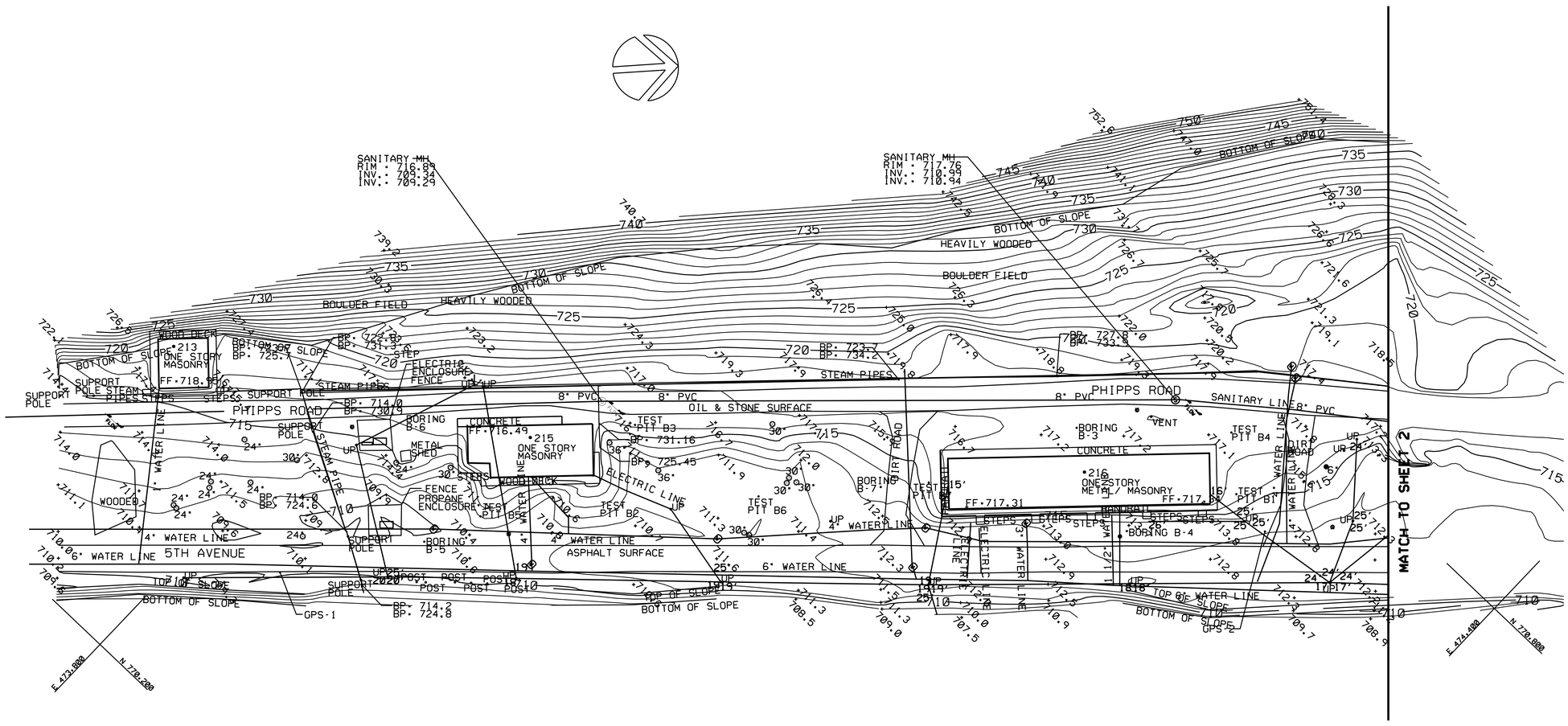
EXPLOSIVE RESEARCH DEVELOPMENT AND LOADING FACILITY
PICATINNY, NEW JERSEY

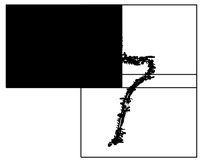
PN 49472

SITE PLAN

SHEET REFERENCE NUMBER:
C-3

1" = 30'

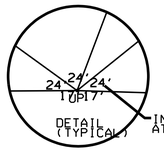




KEYMAP
N.T.S.

SITE LEGEND

UP	UTILITY POLE
24"	DECIDUOUS TREE
24"	EVERGREEN TREE
	WATER VALVE
	FIRE HYDRANT
	MONITOR WELL / TEST PIT / BORINGS
*710.8	SPOT ELEVATION
	STEAM SUPPORT POLE
•GPS-1	CONTROL
	VENT
	SANITARY MANHOLE
•GUY POLE	GUY POLE
	CATCH BASIN
	UTILITY MANHOLE
•FLAG POLE	FLAG POLE
	SIGN
	STEAM LINE
	SANITARY LINE
	WATER LINE
	UNDERGROUND ELECTRIC LINE
	AERIAL ELECTRIC LINE
	STORM DRAINAGE LINE
	GAS LINE
	FENCE
•213 ONE STORY MASONRY	BUILDING



INDICATES HEIGHT OF WIRE AT POLE ABOVE GROUND

NOTE:

1) NUMEROUS SMALL CONCRETE STRUCTURES (@ 6"X 8"X 12" H) SUPPORTS, CONCRETE PADS (4' X 4' SQUARE), ABANDONED UTILITY POLES (ELECTRIC AND LIGHT), ETC. ARE NOT FIELD INSTRUMENT SURVEYED, BUT OBSERVED IN THE AREA NORTH OF PHIPPS ROAD BETWEEN BUILDINGS 213 AND 221. CONTRACTOR SHOULD VISIT SITE TO DETERMINE VOLUME OF REMOVAL.

2) UTILITY LOCATIONS AND SIZES BASED ON FIELD MARKOUTS AND LOCATIONS, ALONG WITH PLANS PROVIDED BY THE MASTER PLANS AND PROGRAM OFFICE AT PICATINNY ARSENAL. (MASTER PLAN DETAIL PLATS) PLATE 53 AND PLATE 60A.

3) HORIZONTAL CONTROL DATUM: N.J.S.P.C.S. NAD 1983

4) VERTICAL CONTROL DATUM: NGVD 1929

TOPOGRAPHIC SURVEY BY:

MEDINA CONSULTANTS P.C.
HACKETTSTOWN, N.J.

1" = 30'

US Army Corps of Engineers
New York District

SYMBOL	DESCRIPTION	DATE	APPRV.

DESIGNED BY: TARAN
DATE: 14 MAY 2004
DWN BY: SHB
CKD BY:
DRAWING CODE:
DRAWING FILE NO.:
REVIEWED BY:
SUBMITTED BY:
PLOT DATE: 17 INCHES
PLOT BY: HECDRAWGES
SCALE: 1" = 30' SCALE 1:1

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
NEW YORK, NEW YORK

TITLE AND NUMBER REVISIONS

EXPLOSIVE PN 45472
RESEARCH, DEVELOPMENT AND LOADING FACILITY
PICATINNY, NEW JERSEY

TOPOGRAPHIC SURVEY

SHEET REFERENCE NUMBER:
SU-1

NOTE:

1) NUMEROUS SMALL CONCRETE STRUCTURES (@ 6'X 8'X 12" H) SUPPORTS, CONCRETE PADS (4' X 4' SQUARE), ABANDONED UTILITY POLES (ELECTRIC AND LIGHT), ETC. ARE NOT FIELD INSTRUMENT SURVEYED, BUT OBSERVED IN THE AREA NORTH OF PHIPPS ROAD BETWEEN BUILDINGS 213 AND 221. CONTRACTOR SHOULD VISIT SITE TO DETERMINE VOLUME OF REMOVAL.

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3) HORIZONTAL CONTROL DATUM: N.J.S.P.C.S. NAD 1983

4) VERTICAL CONTROL DATUM: NGVD 1929

KEYMAP
N.T.S.

US Army Corps of Engineers
New York District

SYMBOL	DESCRIPTION	DATE	APPR.

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
NEW YORK, NEW YORK

DESIGNED BY: TARAN DATE: 14 MAY 2014
DWN BY: SAB CKD BY:
REVIEWED BY:
SUBMITTED BY:
DRAWING CODE:
DRAWING FILE NO.:
PLOT DATE: FIT-INCH
PLOT BY: HERSTENHOVER
FILE NAME: SU-2.DGN

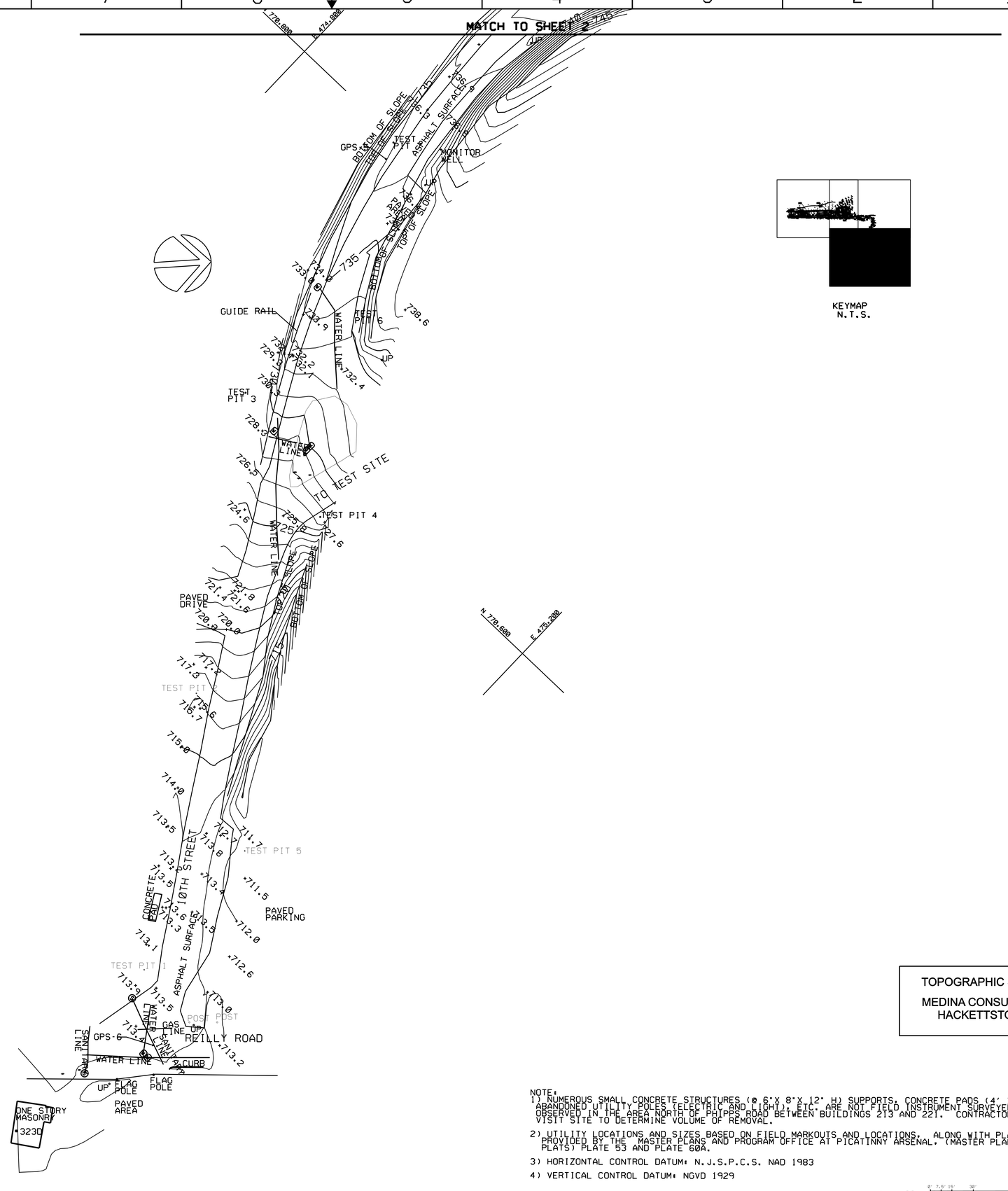
EXPLOSIVE PN 49472
RESEARCH, DEVELOPMENT AND LOADING FACILITY
PICATINNY, NEW JERSEY

TOPOGRAPHIC SURVEY

SHEET REFERENCE NUMBER:
SU-2

TOPOGRAPHIC SURVEY BY:
MEDINA CONSULTANTS P.C.
HACKETTSTOWN, N.J.

1" = 30'



KEYMAP
N.T.S.

SITE LEGEND

UP	UTILITY POLE
24"	DECIDUOUS TREE
24"	EVERGREEN TREE
	WATER VALVE
	FIRE HYDRANT
	MONITOR WELL / TEST PIT / BORINGS
710.8	SPOT ELEVATION
	STEAM SUPPORT POLE
GPS-1	CONTROL
	VENT
S	SANITARY MANHOLE
GUY POLE	GUY POLE
	CATCH BASIN
	UTILITY MANHOLE
FLAG POLE	FLAG POLE
	SIGN
	STEAM LINE
	SANITARY LINE
	WATER LINE
	UNDERGROUND ELECTRIC LINE
	AERIAL ELECTRIC LINE
	STORM DRAINAGE LINE
	GAS LINE
	FENCE
213 ONE STORY MASONRY	BUILDING

TOPOGRAPHIC SURVEY BY:

MEDINA CONSULTANTS P.C.
HACKETTSTOWN, N.J.

NOTE:
1) NUMEROUS SMALL CONCRETE STRUCTURES (@ 6'X 8'X 12' H) SUPPORTS, CONCRETE PADS (4' X 4' SQUARE), ABANDONED UTILITY POLES (ELECTRIC AND LIGHT), ETC. ARE NOT FIELD INSTRUMENT SURVEYED, BUT OBSERVED IN THE AREA NORTH OF PHIPPS ROAD BETWEEN BUILDINGS 213 AND 221. CONTRACTOR SHOULD VISIT SITE TO DETERMINE VOLUME OF REMOVAL.

2) UTILITY LOCATIONS AND SIZES BASED ON FIELD MARKOUTS AND LOCATIONS, ALONG WITH PLANS PROVIDED BY THE MASTER PLANS AND PROGRAM OFFICE AT PICATINNY ARSENAL. (MASTER PLAN DETAIL PLATS) PLATE 53 AND PLATE 60A.

3) HORIZONTAL CONTROL DATUM: N.J.S.P.C.S. NAD 1983

4) VERTICAL CONTROL DATUM: NGVD 1929

1" = 30' 0' 7.5' 15' 30' 60' 90'

US Army Corps of Engineers
New York District

SYMBOL	DESCRIPTION	DATE	APPR.

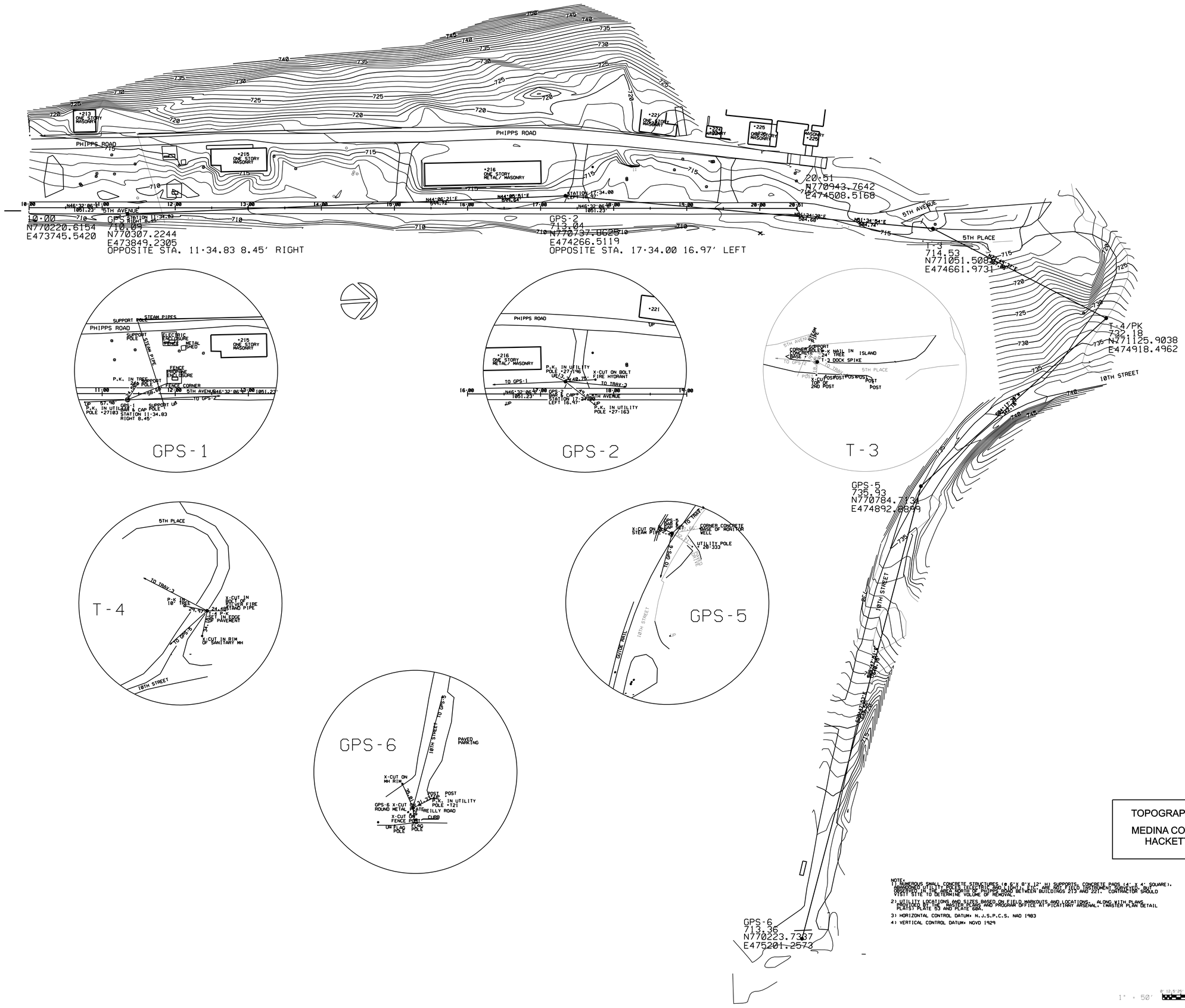
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
NEW YORK, NEW YORK

DESIGNED BY: TARAN | DATE: 14 MAY 2004 | CHECKED BY:
DWN BY: SAB | CKD BY: | DRAWING CODE: | DRAWING FILE NO.:
REVIEWED BY: | SUBMITTED BY: | PLOT DATE: | PLOT BY: | PLOT SCALE: 1:1 | PLOT MODEL:
FILE NAME & DIRECTORY:

PN 49472
EXPLOSIVE RESEARCH, DEVELOPMENT AND LOADING FACILITY
PICATINNY, NEW JERSEY

TOPOGRAPHIC SURVEY

SHEET REFERENCE NUMBER:
SU-3



TOPOGRAPHIC SURVEY BY:

MEDINA CONSULTANTS P.C.
HACKETTSTOWN, N.J.

NOTE:
1) NUMEROUS SMALL CONCRETE STRUCTURES (8'6"X 8"X 12" HJ SUPPORTS, CONCRETE PADS (4' X 4' SQUARE), ABANDONED UTILITY POLES TELECTRIC AND LIGHTS, ETC. ARE NOT FIELD INSTRUMENT SURVEYED BUT OBSERVED IN THE AREA NORTH OF PHIPPS ROAD BETWEEN BUILDINGS 213 AND 221. CONTRACTOR SHOULD VISIT SITE TO DETERMINE VOLUME OF REMOVAL.
2) UTILITY LOCATIONS AND SIZES BASED ON FIELD MARKOUTS AND LOCATIONS, ALONG WITH PLANS PROVIDED BY THE MASTER ACADEMY AND PROGRAM OFFICE AT PICATINNY ARSENAL. (MASTER PLAN DETAIL PLATS1 PLATE 05 AND PLATE 06A.
3) HORIZONTAL CONTROL DATUM: N.J.S.P.C.S. NAD 1983
4) VERTICAL CONTROL DATUM: NGVD 1929

1" = 50'

US Army Corps of Engineers
New York District

SYMBOL	DESCRIPTION	DATE	APPR.

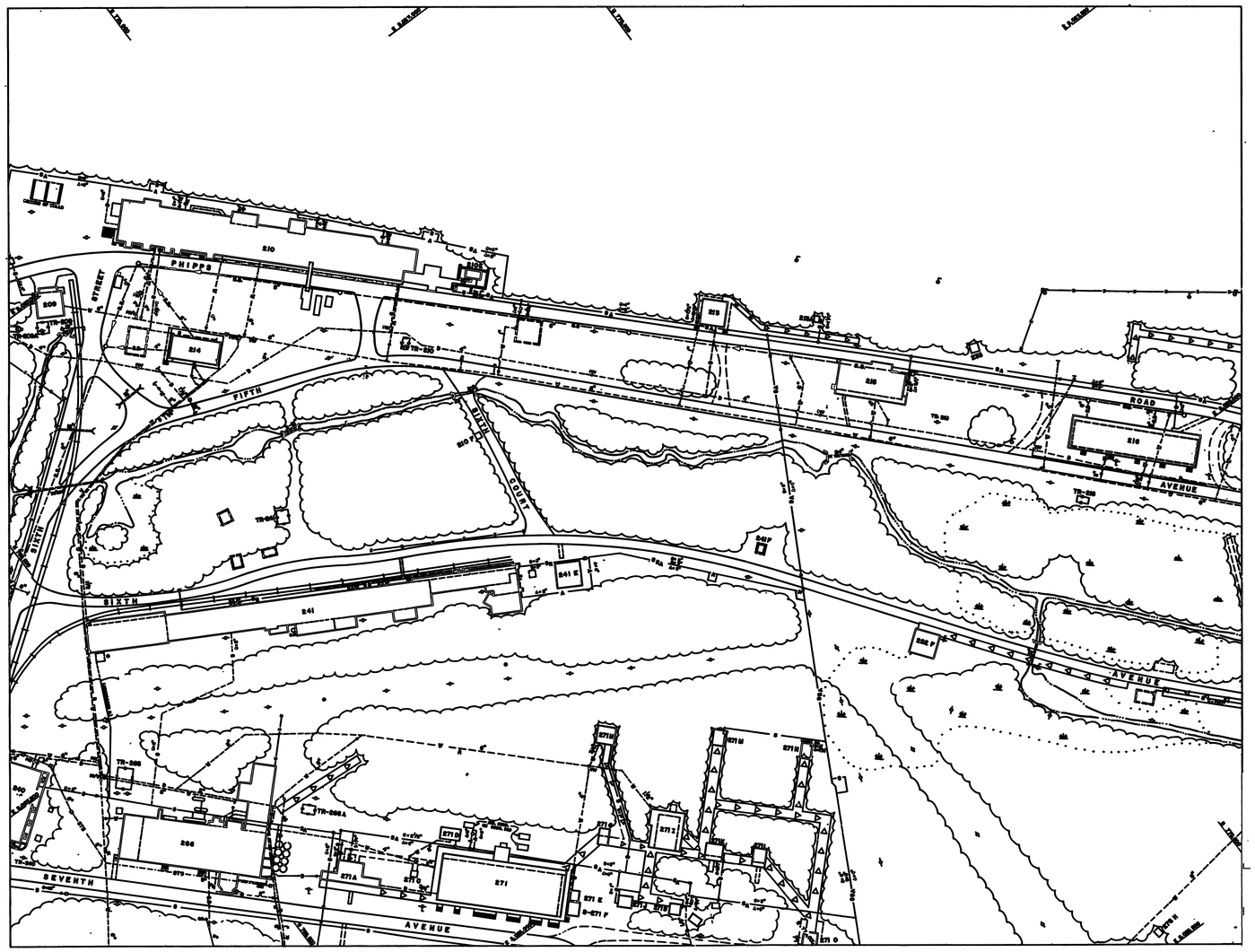
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
NEW YORK, NEW YORK

DESIGNED BY: TARAN
DATE: 14 MAY 2004
DWN BY: SAB
CKD BY:
REVIEWED BY:
SUBMITTED BY:
DRAWING CODE:
DRAWING FILE NO.:
PLOT DATE/TIME:
PLOT BY:
PLOT SCALE:

PN 43472
EXPLOSIVES REMOVAL DEVELOPMENT AND LOADING FACILITY
PICATINNY, NEW JERSEY

TOPOGRAPHIC SURVEY

SHEET REFERENCE NUMBER:
SU-4



WATER & SEWER PLAN

SCALE: 1" = 50'

NOTE REFERENCE DRAWING

THIS DRAWING PROVIDED BY PICATINNY DPW DATA AND INFO FROM MASTER PLAN FILES. THIS DRAWING IS FURNISHED FOR CONTRACTOR REFERENCE PURPOSES.

1" = 50' 0' 12.5' 25' 50' 100' 150'

US Army Corps of Engineers
New York District

SYMBOL	DESCRIPTION	DATE	APPR.

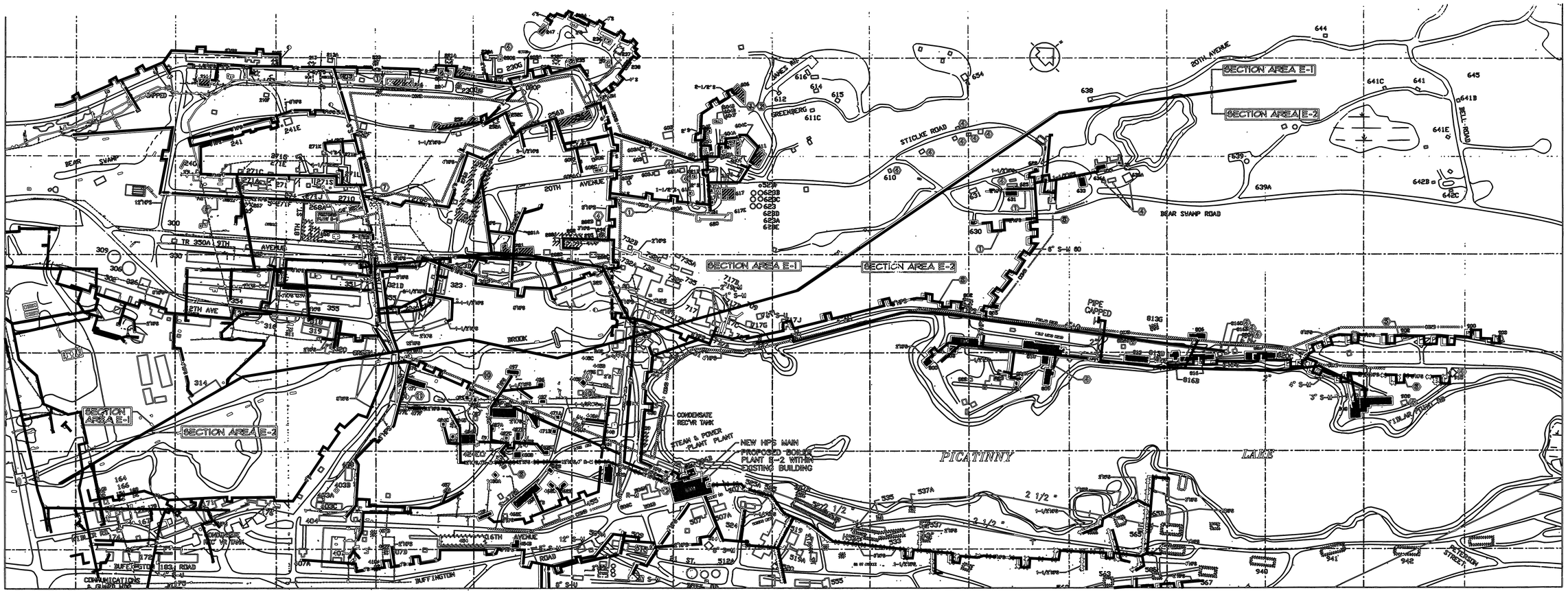
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
NEW YORK, NEW YORK

DESIGNED BY: TARAN
DATE: MAY 2
SHEET:
DWN BY: SHD
CKD BY:
DRAWING FILE NO.:
REVIEWED BY:
DRAWING CODE:
SUBMITTED BY:
PLOT DATE/TIME:
PLOT DIMENSIONS:
24 X 36 INCHES

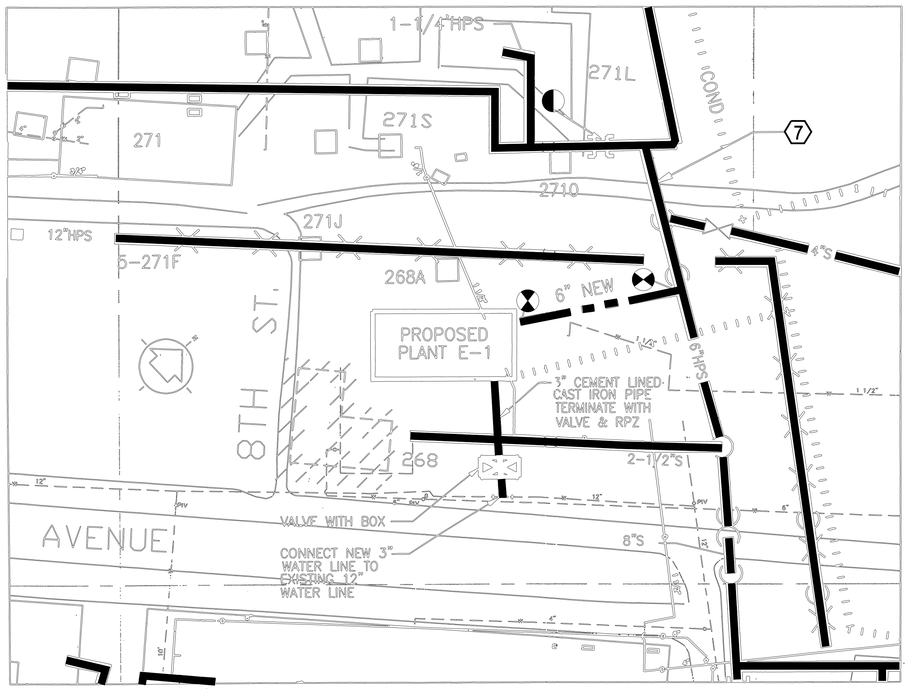
PN 49472
EXPLOSIVE RESEARCH, DEVELOPMENT AND LOADING FACILITY
PICATINNY, NEW JERSEY

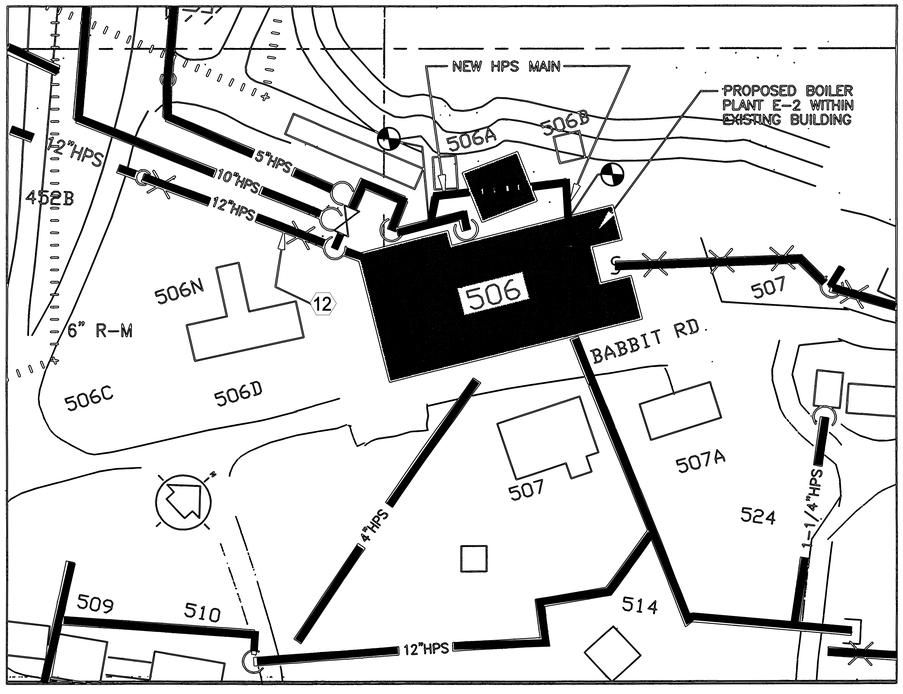
(REFERENCE DRAWING)
WATER & SEWER PLAN

SHEET REFERENCE NUMBER:
RC-1



SITE PLAN
NO SCALE





PIPING NOTES

1. SECTIONS OF PIPE INSULATION MISSING.
2. STEAM LEAK AT PRV STATION.
3. STEAM MAIN DO NOT HAVE PIPE SUPPORTS.
4. PRESENTLY THIS BUILDING HAS NO STEAM HEAT.
5. STEAM SUPPLY TO BUILDING IS CUT-OFF AT MAIN.
6. ABANDONED STEAM PIPING.
7. STEAM LEAK DUE TO BROKEN PIPE.
8. STEAM LEAK DUE TO OPEN STEAM TRAP.
9. STEAM LEAK DUE TO OPEN RELIEF VALVE.
10. STEAM LEAK DUE TO BROKEN SHUT-OFF VALVE.
11. ABANDONED OPEN-END PIPE.
12. PIPE SUPPORT MISSING.

SYMBOLS

- EXISTING WORK SCHEDULED FOR DEMOLITION OR ALREADY DEMOLISHED.
- ABANDONED/REMOVED PIPING
- EXISTING PIPING ABOVE GROUND
- NEW PIPING ABOVE GROUND
- NEW CONDENSATE PIPING
- EXISTING PIPING BELOW GROUND
- MAN HOLE
- POINT OF CONNECTION BETWEEN NEW AND EXISTING
- POINT OF DISCONNECTION
- HPS — HIGH PRESSURE STEAM
- COND — CONDENSATE

NOTE REFERENCE DRAWING

THIS DRAWING PROVIDED BY PICATINNY DPW DATA AND INFO FROM MASTER PLAN FILES. THIS DRAWING IS FURNISHED FOR CONTRACTOR REFERENCE PURPOSES.

US Army Corps of Engineers
New York District

SYMBOL	DESCRIPTION	DATE	APPR.

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
NEW YORK, NEW YORK

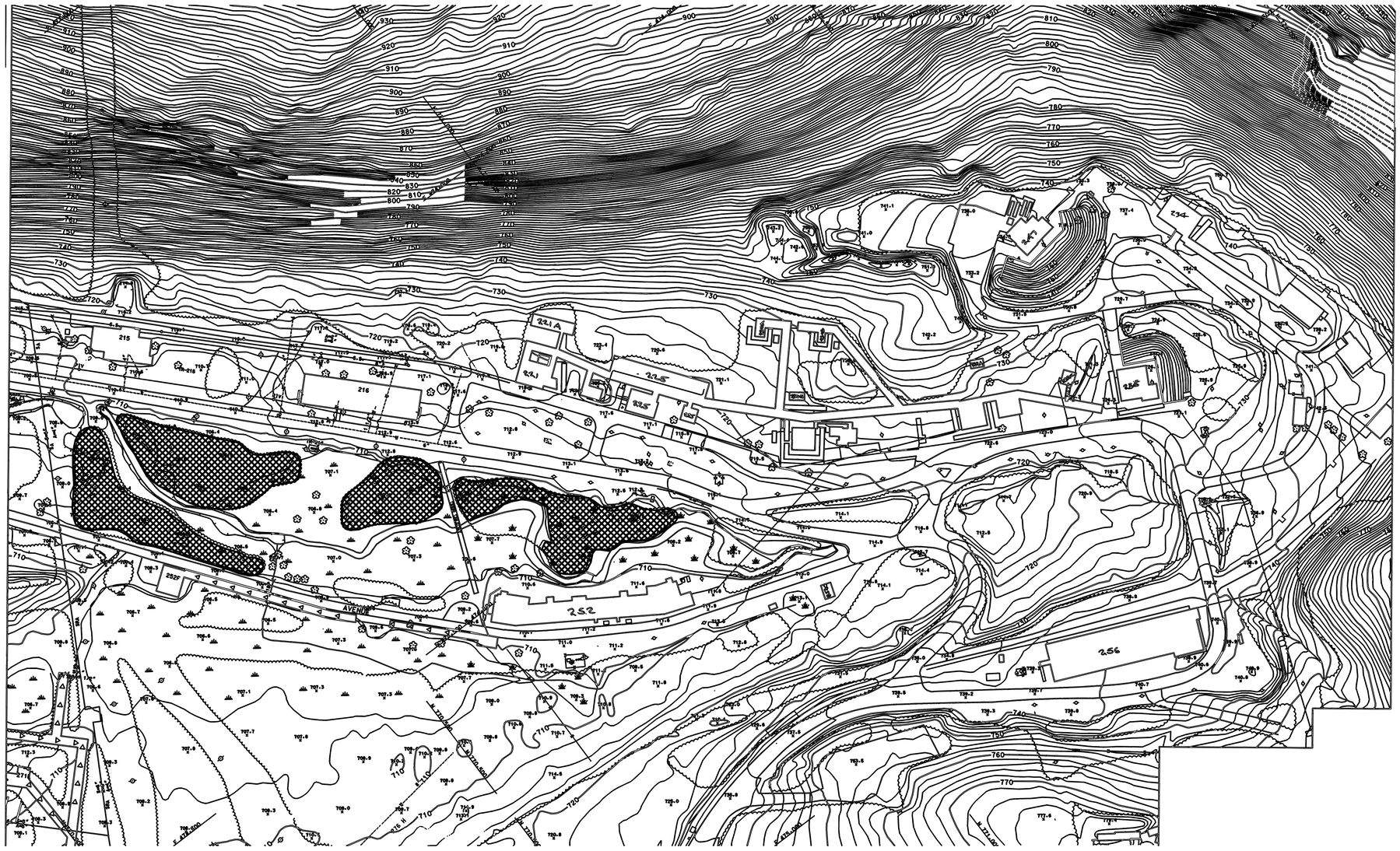
DESIGNED BY: TARAN
DATE: MAY 2004
DRAWN BY: SAG
CKD BY:
DRAWING CODE:
DRAWING FILE: N/A
REVIEWED BY:
SUBMITTED BY:
PLOT DATE: 7 MAY
PLOT BY: HUESTEBRANDER
PAGE SIZE: 24X36 D

FILE: RC02 & RC03-01.DGN

EXPLOSIVE PN 49472
RESEARCH, DEVELOPMENT AND LOADING FACILITY
PICATINNY, NEW JERSEY

(REFERENCE DRAWING)
STEAM LINES

SHEET REFERENCE NUMBER:
RC-2



WETLANDS DELINEATION PLAN

NOT TO SCALE

LEGEND

SYMBOL DENOTES PROTECTED WETLANDS

NOTE REFERENCE DRAWING

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US Army Corps of Engineers
New York District

SYMBOL	DESCRIPTION	DATE	APPR.

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
NEW YORK, NEW YORK

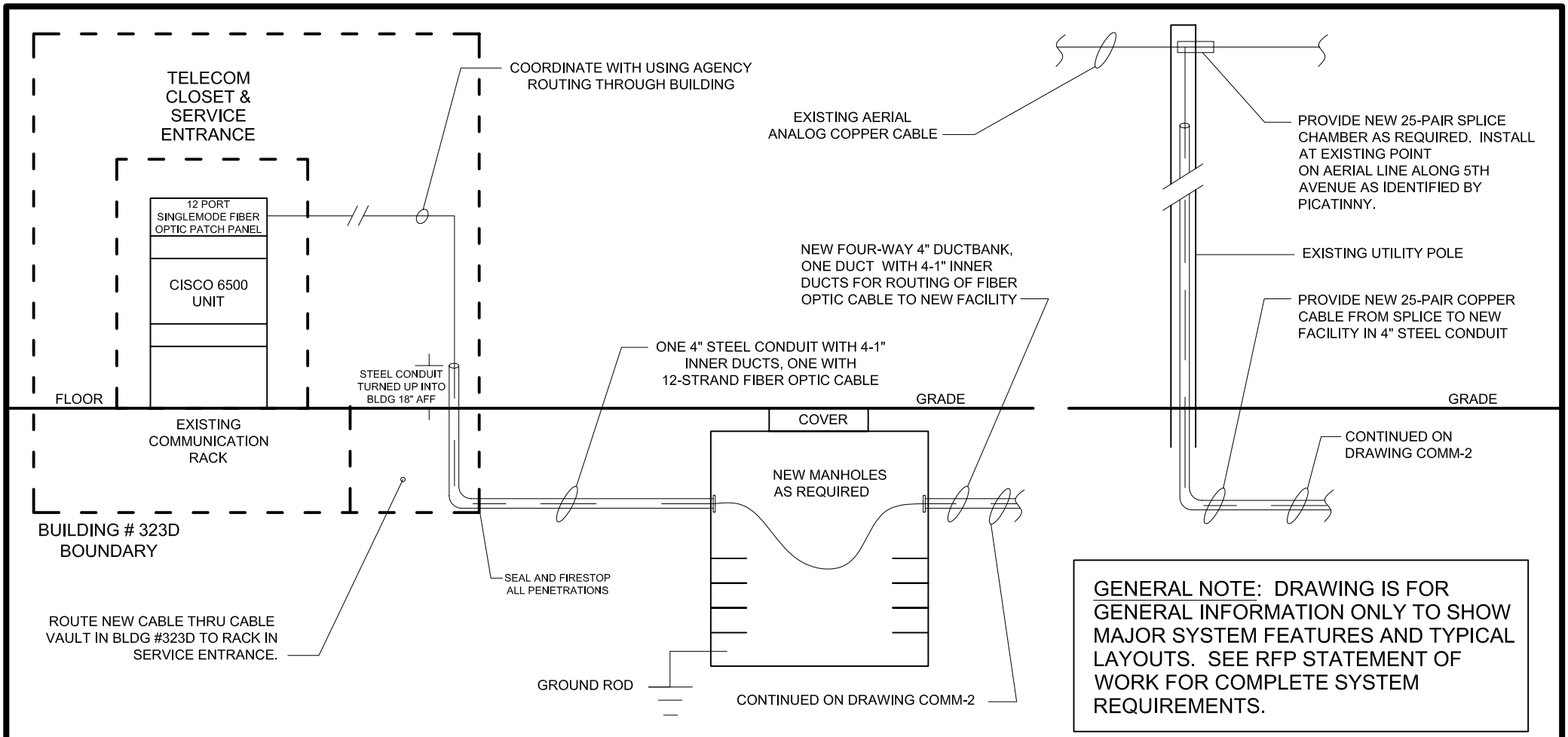
DESIGNED BY: TARAN
DWN BY: SMB
CKD BY:
REVIEWED BY:
SUBMITTED BY:
DATE: MAY 2004
DRAWING FILE NO.:
DRAWING CODE:
PLOT DATE:
PLOT BY:
PLOT SCALE:
SIZE: REV.:

EXPLOSIVE RESEARCH DEVELOPMENT AND LOADING FACILITY
PN 49472
PICATINNY, NEW JERSEY

(REFERENCE DRAWING)
WETLANDS DELINEATION PLAN

SHEET REFERENCE NUMBER:
RC-3

ATTACHMENT R

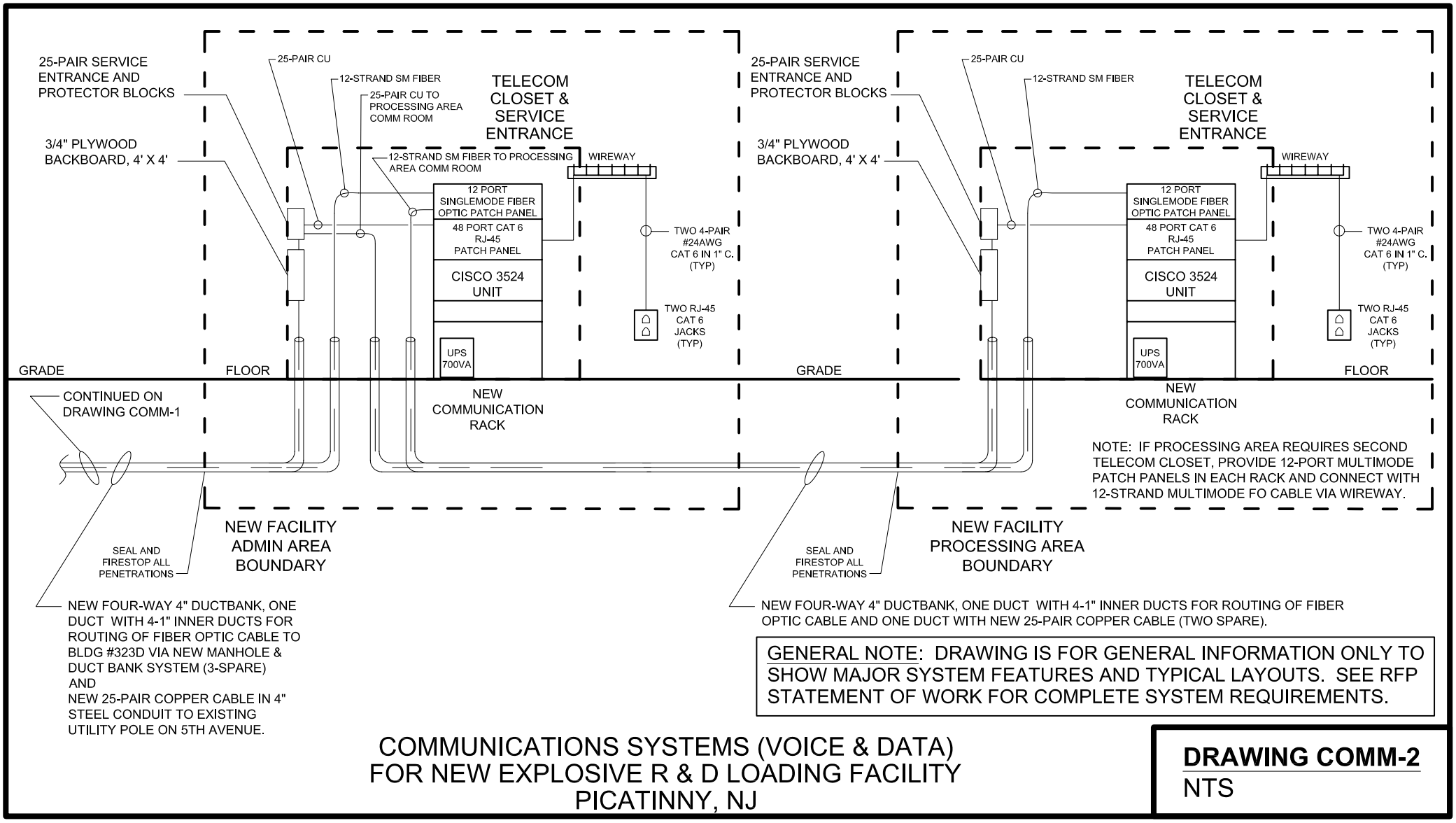


GENERAL NOTE: DRAWING IS FOR GENERAL INFORMATION ONLY TO SHOW MAJOR SYSTEM FEATURES AND TYPICAL LAYOUTS. SEE RFP STATEMENT OF WORK FOR COMPLETE SYSTEM REQUIREMENTS.

FIBER OPTIC SERVICE AND ANALOG COPPER VOICE SERVICE SOURCES FOR NEW EXPLOSIVE R & D LOADING FACILITY PICATINNY, NJ

DRAWING COMM-1

NTS



GENERAL NOTE: DRAWING IS FOR GENERAL INFORMATION ONLY TO SHOW MAJOR SYSTEM FEATURES AND TYPICAL LAYOUTS. SEE RFP STATEMENT OF WORK FOR COMPLETE SYSTEM REQUIREMENTS.

COMMUNICATIONS SYSTEMS (VOICE & DATA) FOR NEW EXPLOSIVE R & D LOADING FACILITY PICATINNY, NJ

DRAWING COMM-2

NTS

Catalyst 3524-PWR XL Stackable 10/100 Ethernet Switch

The Catalyst® 3524-PWR XL switch is a member of the Cisco Systems Catalyst 3500 Series XL, a scalable line of stackable 10/100 and Gigabit Ethernet switches that delivers premium performance, manageability, and flexibility with unparalleled investment protection. Advanced quality of service (QoS) fully integrated with Cisco IP phones and high-availability network features make the Catalyst 3524-PWR XL the premier switching solution for customers as they prepare their local-area networks (LAN) for integrated voice, video, and data applications.

The Catalyst 3524-PWR XL switch has 24 10/100 switched ports with integrated inline power and two Gigabit Interface Converter (GBIC)-based Gigabit Ethernet ports (See Figure 1). Integrated inline power provides DC current to devices that can accept power over traditional unshielded twisted pair (UTP) cabling (for example, the Cisco 7900 family of Cisco IP phones). The dual GBIC-based Gigabit Ethernet implementation provides customers with tremendous deployment flexibility—allowing customers to implement one type of stacking and uplink configuration today, while preserving the option to migrate that configuration in the future.

Any customer who expects to deploy converged network applications in the future must consider deploying LAN equipment such as switches today that can support those increased requirements. Such switches should be able to treat time-sensitive traffic such as voice and critical data traffic with the appropriate priority and ensure that the network can recover immediately from any network convergence or power failure. The Catalyst 3524-PWR XL is easy to deploy in traditional data LANs and has the advanced QoS and high-availability features to prepare networks to run applications that merge voice, video and data traffic.

Figure 1 The Catalyst 3524-PWR XL switch provides 24 10/100 ports with integrated inline power and two built-in GBIC-based Gigabit Ethernet ports with up to 7.0 million packets per second performance

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Quality of Service

All Catalyst 3500 Series XL switches support LAN edge QoS based on the Institute of Electrical and Electronic Engineers (IEEE) 802.1p class of service (CoS), as well as port-based prioritization. The Catalyst 3524-PWR XL supports port-based reclassification, which allows the switch to change the CoS settings of tagged packets on a per-port basis. For untagged packets, the switch uses the default ingress port priority to classify the packets. Priority scheduling is applied between the queues, which ensures that the high priority queue is always serviced before scheduling the lower priority traffic. These features enable users to prioritize mission critical traffic, such as Voice over IP (VoIP) and Enterprise Resource Planning (ERP) applications over regular traffic, such as File Transfer Protocol (FTP) or low-priority Web surfing traffic.

Catalyst 3500 XL and 2900 XL switches can automatically configure Virtual LAN (VLAN) and trusted-extension settings for IP telephones, which overcomes the management complexity of overlaying a voice topology onto a data network and maintaining the quality of voice traffic. With the auxiliary VLAN feature, network administrators can segment phones into separate logical networks even though the data and voice infrastructure is physically the same. The auxiliary VLAN feature places the phones into their own VLANs without any end-user intervention. The user simply plugs the phone into the switch, and the switch will provide the phone with the necessary VLAN information. Trusted extension settings allow the switch to ensure that voice traffic from an IP phone gets high-priority treatment by controlling how traffic from a daisy-chained device is classified.

Resiliency Features

Catalyst 3500 Series XL switches have a number of hardware- and software-based high-availability features that prevent network and power outages from disrupting network availability, including inline power and advanced spanning-tree convergence.

Catalyst 3524-PWR XL can provide 48-volt DC power over standard Category 5 UTP cable up to 100 meters. Instead of requiring wall power at every desktop, terminal devices such as IP telephones can utilize power provided from the Catalyst 3524-PWR XL switch. With the Phone Discovery feature, the Catalyst switch automatically detects the presence of an IP phone and supplies inline power. By deploying Catalyst 3524-PWR XL switches with uninterruptible power supply (UPS) systems in secured wiring closets, network administrators can ensure that power outages will not affect a building's network telephony connections.

The Cisco Redundant Power System 300 (RPS 300) provides internal power supply redundancy for up to six networking devices and features an immediate fail-over capability. The Cisco RPS 300 can be combined with the Catalyst 3524-PWR Series XL desktop switch and a UPS to establish the Cisco Centralized Power Provisioning System.

Dual gigabit uplinks on the Catalyst 3524-PWR XL switch provide physical uplink redundancy in case the primary link goes down. Enhanced spanning-tree convergence features such as Port Fast, Uplink Fast and Per VLAN Spanning Tree (PVST) ensure rapid convergence of spanning tree in the case of link failure. PVST allows users to implement redundant uplinks while also distributing traffic loads across multiple links—not possible with standard shielded twisted pair (STP) implementations. Cisco Uplink Fast and Cisco Cross Stack Uplink Fast technologies ensure quick failover recovery, enhancing network and stack stability and reliability.

Software Management Features

Cisco Catalyst 3500 Series XL switches include several exceptional features to increase performance and manageability for converged networks. To boost performance, Fast EtherChannel® and Gigabit EtherChannel technology offer from 400 Mbps to 4 Gbps high-performance bandwidth among Catalyst switches, routers, and servers. The Cisco Group Management Protocol (CGMP) enhances the performance of multimedia applications and reduces network traffic by allowing a switch to selectively and dynamically forward IP multicast traffic to targeted end stations.

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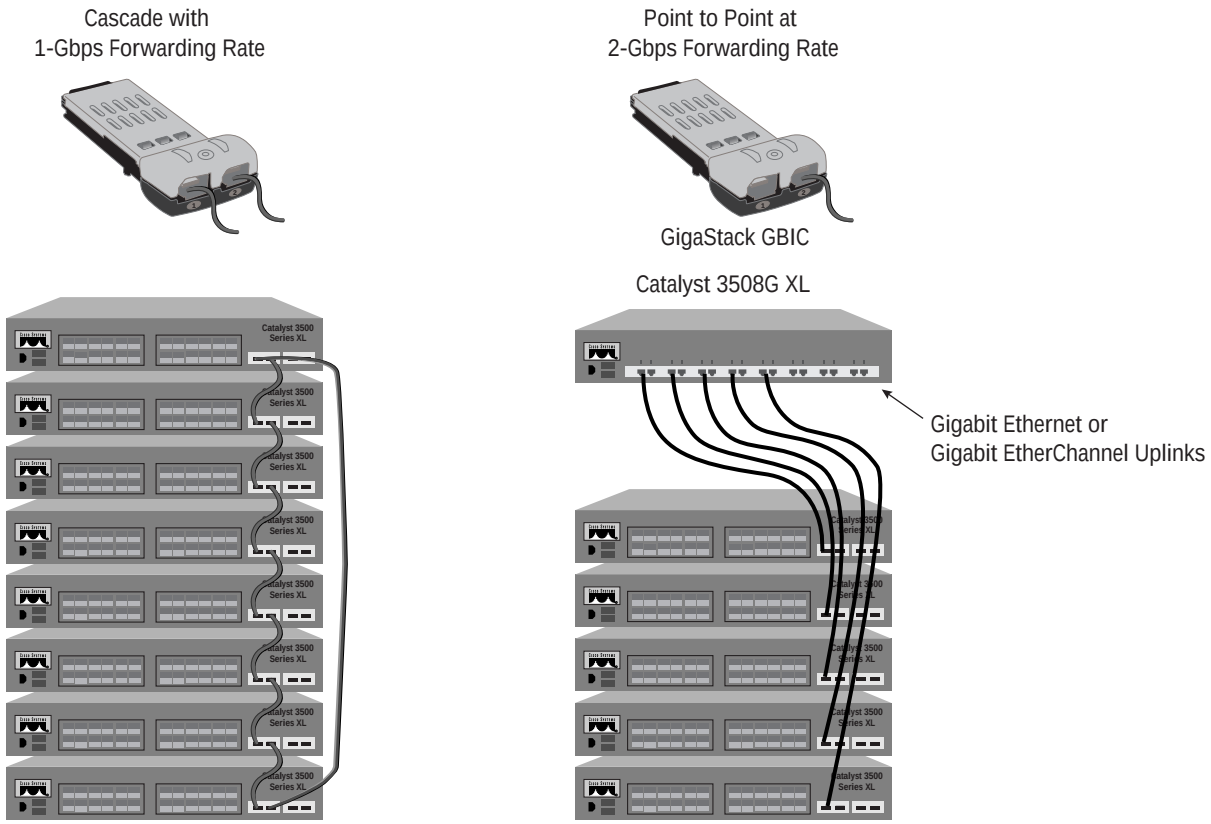
Flexible Stacking with the GigaStack GBIC

The Catalyst 3500 Series XL and Gigabit Ethernet-enabled Catalyst 2900 Series XL switches can be stacked using the low-cost Cisco GigaStack GBIC. The two-port GigaStack GBIC offers a range of highly flexible stacking and performance options. Customers can deploy a 1 Gbps independent stack backplane in a cascade configuration, or scale up to 5 Gbps of bandwidth in a star configuration using the Catalyst 3508G XL Gigabit Ethernet aggregation switch (See Figure 2). Network managers may use one or both of the available GBIC ports to create high-speed uplinks to the network core, using standard Gigabit Ethernet or Gigabit EtherChannel technology. High levels of stack resiliency can also be implemented by deploying dual redundant Gigabit Ethernet Uplinks, a redundant GigaStack loopback cable, Uplink Fast for high-speed uplink failover, and per VLAN Spanning Tree (PVST+) for uplink load balancing. This Gigabit Ethernet flexibility makes the Catalyst 3500 Series XL an ideal LAN edge complement to the Cisco Catalyst 6500 family of Gigabit Ethernet-optimized core LAN switches.

Cisco Switch Clustering

Breakthrough Cisco switch clustering technology enables up to 16 interconnected Catalyst 3500 XL, Catalyst 2900 XL, and Catalyst 1900 switches—regardless of geographic proximity—to form a single IP management domain. Switch-cluster connectivity options for the Catalyst 3500 Series XL include Ethernet, Fast Ethernet, Fast EtherChannel, low-cost Cisco GigaStack GBIC, Gigabit Ethernet, and Gigabit EtherChannel connectivity. Because the technology is not limited by proprietary stacking modules or stacking cables, Cisco switch clustering expands the traditional stacking domain beyond a single wiring closet. Catalyst 3500 XL switches can be configured either as command or member switches in a Cisco switch stack or cluster. The command switch serves as the single IP address management point and disburses all management instructions dictated by the network administrator. Command switches can cluster up to 15 additional interconnected member switches regardless of interconnection media.

Figure 2 Customers can start with a low-cost GigaStack, GBIC-based, 1 Gbps, independent stack backplane. At any point, users have the option to increase their stack performance to 5 Gbps using the same GigaStack GBICs In combination with the high-performance Catalyst 3508G XL Gigabit Ethernet aggregation switch.



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Key Features/Benefits

Exceptional Performance

- Twelve, 24, or 48 10Base-T/100Base-TX autosensing ports, each delivering up to 200 Mbps of bandwidth to individual users, servers, or workgroups to support bandwidth-intensive applications
- Two built-in, GBIC-based Gigabit Ethernet ports, delivering up to 4 Gbps aggregated bandwidth to Gigabit Ethernet backbones, Gigabit Ethernet servers, or between switches
- 10.8 Gbps switching fabric and up to a 8.0-million-packets-per-second forwarding rate, ensuring high performance forwarding to each 10Base-T/100Base-TX and Gigabit Ethernet port
- 4 MB shared-memory architecture, ensuring the highest-possible throughput with a design that eliminates head-of-line blocking, minimizes packet loss, and delivers better overall performance in environments with extensive multicast and broadcast traffic
- Full-duplex operation on all ports, delivering up to 200 Mbps on 10/100 ports or 2 Gbps on 1000Base-X ports
- Dual-priority forwarding queues on each 10/100 and Gigabit Ethernet ports, enabling network traffic prioritization and seamless data, voice, and video integration through IEEE 802.1p protocol
- Trusted extension settings allows the switch to set trusted port settings for the PC port on Cisco IP phones, ensuring voice traffic receives highest priority
- Port-based reclassification allows users to reclassify IEEE 802.1p class-of-service (CoS) values on a per-port basis (via command-line interface [CLIs]) enabling a finer granularity of control to implement LAN edge QoS
- Bandwidth aggregation through Fast EtherChannel and Gigabit EtherChannel technologies, enhancing fault tolerance and offering from 400 Mbps to 4 Gbps of aggregated bandwidth between switches, and to routers and individual servers
- GigaStack GBIC delivers a low-cost, independent stack bus with a 1 Gbps forwarding bandwidth in a daisy-chain configuration, with up to nine Catalyst 3500 XL or gigabit-enabled Catalyst 2900 Series XL switches or a 2 Gbps forwarding rate in a point-to-point configuration
- GBIC-based Gigabit Ethernet ports give customers a choice of 1000Base-T, 1000Base-SX, 1000Base-LX/LH, 1000Base-ZX or Cisco GigaStack stacking GBICs to fit their connection needs
- Per-port broadcast, multicast and unicast storm control prevents faulty end stations from degrading overall system performance

Flexible and Scalable Switch Clustering Architecture

- Cisco Switch Clustering technology allows a user to manage up to sixteen interconnected Catalyst 3500 XL, 2900 XL, and Catalyst 1900 switches through a single IP address regardless of location
- Command Switch Redundancy allows customers to designate a backup command switch, which takes over cluster management functions in the event of a failure of the primary command switch

Ease of Use and Ease of Deployment

- Auxiliary VLAN via 802.1Q supports automatic segmentation of phone and data endpoints into separate logical networks
- Cluster software administration feature allows the network manager to quickly and easily upgrade the system software on a group of Catalyst 3500 XL, 2900 XL, and Catalyst 1900 switches
- IEEE 802.3z-compliant 1000Base-T, 1000Base-SX, 1000Base-LX/LH, and 1000Base-ZX physical interface support through a field-replaceable GBIC module provides customers unprecedented flexibility in switch deployment
- Autosensing on each port detects attached device speed and automatically configures the port for 10 or 100 Mbps operation, easing the deployment of the switch in mixed 10Base-T and 100Base-TX environments
- Autonegotiating on all ports automatically selects half- or full-duplex transmission mode to optimize bandwidth
- Autoconfiguration eases switch deployment in the network by automatically configuring multiple switches across a network via a boot server
- Default configuration stored in Flash memory ensures that a switch can be quickly connected to the network and can pass traffic with minimal user intervention, preserving configuration in case of a power outage

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- Voice VLAN creates a new subnet for use by IP phones in cases where there are not enough free IP addresses in the existing subnets

Integrated Cisco IOS Switching Solution

- Cisco Group Management Protocol (CGMP) enables a switch to selectively and dynamically forward routed IP multicast traffic to targeted multimedia end stations, reducing overall network traffic
- CGMP Fast Leave allows end stations to quickly exit from a multicast session, reducing superfluous network traffic
- Virtual LAN trunks can be created from any port using either standards-based 802.1Q tagging or the Cisco Inter Switch Link (ISL) VLAN architecture
- IEEE 802.1p Layer 2 protocol for prioritization of mission-critical and time-sensitive traffic from data, voice, and telephony applications
- Cisco Virtual Trunking Protocol (VTP) supports dynamic VLANs and trunk configuration across all switches
- Cisco IOS® Command-Line Interface (CLI) support provides common user interface and command set across all Catalyst series switches and Cisco routers
- Cisco Discovery Protocol (CDP) enables a CiscoWorks network management station to automatically discover a switch in a network topology

Superior Manageability

- Built-in Web-based management interface provides easy-to-use management through a standard browser such as Netscape Navigator or Microsoft Explorer
- Simple Network Management Protocol (SNMP) and Telnet interface support deliver comprehensive in-band management, and a CLI-based management console provides detailed out-of-band management
- Manageable through CiscoWorks2000 network management software on a per-port and per-switch basis, providing a common management interface for Cisco routers, switches, and hubs
- 8 MB DRAM and 4 MB Flash memory onboard, enabling the addition of a continuous stream of feature upgrades and maximizing customer investments
- Configurable network port, supporting unlimited Media Access Control (MAC) addresses for backbone connectivity
- Embedded Remote Monitoring (RMON) software agent supports four RMON groups (History, Statistics, Alarms, and Events) for enhanced traffic management, monitoring, and analysis
- Support for all nine RMON groups through use of a Switch Port Analyzer (SPAN) port that permits traffic monitoring of a single port, a group of ports, or the entire switch from a single network analyzer or RMON probe
- Domain Name System (DNS) client support provides IP address resolution with user-defined device name
- Trivial File Transfer Protocol (TFTP) reduces the cost of administering software upgrades by downloading from a centralized location
- Network Time Protocol (NTP) provides an accurate and consistent timestamp to all switches within the intranet
- Multifunction LEDs per port for port status, half-duplex/full-duplex, and 10Base-T/100Base-TX indication, as well as switch-level status LEDs for system, redundant power supply (RPS), bandwidth utilization and inline power provide a comprehensive and convenient visual management system
- Spanning Tree Root Guard (STRG) prevents devices not in the network administrator's or service provider's control from becoming STP root nodes by configuring STRG on device ports it does control
- VTP pruning limits broadcasts on VTP trunks. When VTP pruning is enabled, broadcast traffic is flooded only on trunk links required to reach the destination devices.

Security and Redundancy

- Inline power 48-volt DC power is provided over Category 5 UTP cable up to 100 meters (pin assignment: 1, 2, 3, 6)
- Cisco Uplink Fast technology ensures quick fail-over recovery, enhancing overall network stability and reliability
- Cross-Stack Uplink Fast (CSUF) technology provides increased redundancy and network resiliency through fast-spanning-tree convergence (less than two seconds) across a stack of switches using Gigastack GBICs

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- Private VLAN edge provides security and isolation between ports on a switch, ensuring that voice traffic travels directly from its entry point to the aggregation device through a virtual path and cannot be directed to a different port
- Support for TACACS+ authentication enables centralized control of the switch and restricts unauthorized users from altering the configuration
- MAC-based port-level security prevents unauthorized stations from accessing the switch
- User-selectable address learning mode simplifies configuration and enhances security
- Multilevel security on console access prevents unauthorized users from altering switch configurations
- IEEE 802.1D Spanning-Tree Protocol support for redundant backbone connections and loop-free networks simplifies network configuration and improves fault tolerance
- Support for a redundant loopback cable connecting the top and bottom switches in a GigaStack stack
- Support for optional Cisco Redundant Power System 300 (RPS 300) provides internal power supply redundancy and resiliency
- Support for optional Cisco 300 watt redundant AC power system provides a backup power source for up to four units for improved fault tolerance and network uptime

Technical Specifications

Performance

- 10.8 Gbps switching fabric
- 6.5 million pps wire-speed forwarding rate for 64-byte packets
- 5.4 Gbps maximum forwarding bandwidth
- 4 MB memory architecture shared by all ports
- 8 MB DRAM and 4 MB Flash memory
- 8192 MAC addresses

Management

- SNMP Management Information Base (MIB) II, SNMP MIB extensions, Bridging MIB (RFC 1493)

Standards

- IEEE 802.3x full duplex on 10Base-T, 100Base-TX, and 1000Base-X ports
- IEEE 802.1D Spanning-Tree Protocol
- IEEE 802.1p CoS prioritization
- IEEE 802.1Q VLAN
- IEEE 802.3ab 1000Base-T specification
- IEEE 802.3z 1000Base-X specification
- 1000Base-X (GBIC)
  - 1000Base-T
  - 1000Base-SX
  - 1000Base-LX/LH
  - 1000Base-ZX
- IEEE 802.3u 100Base-TX specification
- IEEE 802.3 10Base-T specification

Connectors and Cabling

- 10Base-T ports: RJ-45 connectors; two-pair Category 3, 4, or 5 UTP cabling
- 100Base-TX ports: RJ-45 connectors; two-pair Category 5 UTP cabling
- 1000Base-T GBIC ports: RJ-45 connectors; two-pair Category 5 UTP cabling
- 1000Base-SX,-LX/LH and -ZX GBIC ports: SC fiber connectors, single-mode or multimode fiber
- GigaStack GBIC ports: copper-based Cisco GigaStack cabling
- Management console port: RJ-45 connector, RS-232 serial cabling

Indicators

- Per-port status LEDs—link integrity, disabled, activity, speed, full-duplex indications and inline power enabled
- System status LEDs—system, RPS, and bandwidth utilization indications
- Fan-fault on over-temperature indicators

Dimensions and Weight (H x W x D)

- 1.75 x 17.5 x 11.8 in. (4.4 x 44.5 x 30 cm)
- One rack-unit (RU) high
- 12 lb (5.45 kg)

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Environmental Conditions and Power Requirements

- Operating temperature: 32 to 113 F (0 to 45 C)
- Storage temperature: -13 to 158 F (-25 to 70 C)
- Operating relative humidity: 10 to 85% noncondensing
- Operating altitude: Up to 10,000 ft (3000 m)
- Power consumption: 325W maximum; 1100 BTU per hour (Actual power consumption depends on number of IP phones connected. 325W represents 24 IP phones connected)
- AC input voltage/frequency: 100 to 127/200 to 240 VAC (autoranging) 50 to 60 Hz
- MTBF 150,000 hours

Safety Certifications

- UL 1950, Third Edition
- CAN/CSA 22.2 No. 950-95, Third Edition
- NOM-019-SCFI
- AS/NZS 3260 and TS001-1997
- IEC 60950 with all country deviations
- EN 60950 with Amendmenta A1-A4 and A11
- CE Marking

Electromagnetic Emissions Certifications

- FCC Part 15 Class A
- EN 55022b Class A (CISPR 22 Class A)
- VCCI Class A
- AS/NZS 3548 Class A
- BCIQ
- CE Marking

Warranty

- Lifetime limited warranty

Ordering Information

Model Number

- WS-C3524-PWR-XL-EN (24-port 10/100 with integrated inline power + two-port 1000Base-X, Enterprise Edition)

For More Information on Cisco Products, contact:

- U.S. and Canada: 800 553-NETS (6387)
- Europe: 32 2 778 4242
- Australia: 612 9935 4107
- Other: 408 526-7209
- World Wide Web URL: http://www.cisco.com

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01/01 BW6939

Data Sheet

Cisco IP Phone 7960G

As the market leader in true IP Telephony, Cisco continues to deliver unsurpassed end-to-end data and VoIP solutions, offering the most complete, stylish, fully featured IP Phone portfolio to enterprise and small-to-medium sized customers. Cisco IP phones provide unmatched levels of integrated business functionality and converged communications features beyond today's conventional voice systems.

The Cisco IP phone family includes phones with large pixel-based displays to bring productivity enhancing applications to the phone, as well as customization options that can be modified as needs change, and provide inline power support over Ethernet. The Cisco IP Phone 7960G is 'multi-protocol enabled' supporting Session Initiated Protocol (SIP), Media Gateway Control Protocol (MGCP), as well as Cisco's CallManager Skinny Client Control Protocol (SCCP).

The Cisco IP Phone 7960G, a key offering in the IP Phone portfolio, is a fully featured IP phone, perfect for managers and executives, providing six programmable line and feature buttons, and a high quality speakerphone. The Cisco IP Phone 7960G offers four dynamic soft keys that guide a user through call features and functions. Built-in headset port and integrated Ethernet Switch are standard with the Cisco IP Phone 7960G. Also includes audio controls for full duplex speakerphone, handset and headset. The Cisco IP Phone 7960G also features a large, pixel-based LCD display. The display provides features such as date and time, calling party name, calling party number,

Cisco IP Phone 7960G

Icon buttons

With Word Overlay, English (Included in documentation package with each phone)

Figure 1

Cisco IP Phone 7960G

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and digits dialed. The graphic capability of the display allows for the inclusion of such features as XML (Extensible Markup Language) and future features. The 7960G is multi-protocol capable (SCCP, SIP, MGCP).

Features

The Cisco 7960G is dynamic and designed to grow with system capabilities. Features will keep pace with new changes via software updates to the phone's flash memory. The phone provides many accessibility methods according to user preference. Various methods or paths include buttons, softkeys, a navigation key, and direct access with the use of corresponding "ghost" digits. Each of the features below will have expanded capabilities in the future:

Messages—

Direct access to voice mail. In the near future voice mail speech to text readout on the display.

Directories—

The Cisco IP Phone 7960G identifies incoming messages and categorizes them for users on the screen. This allows users to quickly and effectively return calls using direct dial-back capability.

The corporate directory integrates with the Lightweight Directory Access Protocol (LDAP3) standard directory.

Settings—

The Settings feature key allows the user to adjust display contrast and select from a large number of ringer sounds,

volume settings for all audio such as ringer, handset, headset, and speaker. Network Configuration preferences can also be set up. (Network configuration is usually set up by the System Administrator.) Configuration can either be automatic or manually set up for Dynamic Host Control Protocol (DHCP), Trivial File Transfer Protocol (TFTP), CallManager, and backup CallManagers.

A huge advantage is the ability for no hands on moves and changes. Just pick up the phone and move to the new location anywhere on your network. No system administration is required.

Services—

The Cisco 7960G allows users to quickly access diverse information such as weather, stocks, quote of the day, or any Web-based information using extensible markup language (XML) to provide a portal to an ever-growing world of features and information.

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Help—

The online help feature gives users information about the phone's keys, buttons, and features. The pixel display allows for greater flexibility of features and significantly expands the information viewed when using features such as Services, Information, Messages, and Directory. For example, the Directory button can show local and server-based directory information.

The Cisco IP Phone 7960G features high-quality, speakerphone technology. It also includes an easy-to-use speaker on/off button and microphone mute buttons. These buttons are lit when active.

The internal Cisco two-port Ethernet switch allows for a direct connection to a 10/100BASE-T Ethernet network via an RJ-45 interface with single LAN connectivity for both the phone and a co-located PC. The system administrator can designate separate virtual LANs (VLANs) (802.1Q) for the PC and Cisco IP Phones providing improved security and reliability of voice and data traffic.

A dedicated headset port eliminates the need for a separate amplifier when using a headset. This allows the handset to remain in its cradle, making headset use simpler. The Cisco IP phone’s convenient volume control button provides for easy decibel-level adjustments for the speakerphone, handset, headset, and ringer. The handset in HEaring Aid Compatible (HAC) and meets FCC loudness requirements for Americans with Disabilities Act (ADA). Section 508 loudness requirements can be achieved using industry standard inline handset amplifiers such as Walker Equipment W-10 or CE-100 amplifiers.

The dial pad is also ADA compliant.

The footstand of the Cisco 7960G is adjustable from flat to 60 degrees to provide optimum display viewing and comfortable use of all buttons and keys. The footstand is keyed to match standard wall jack configurations for wall mounting. Two optional wall mount brackets are also offered as noted below.

The Cisco IP Phone 7960G can also receive power down the LAN from any of the Cisco inline power-capable blades and boxes.

For added security, the audible dual-tone multifrequency (DTMF) tones are masked when the speakerphone mode is used.

Other Cisco IP Phone 7960G features include:

- 24+ user-adjustable ring tones
- A hearing-aid-compatible handset (meets American Disabilities Act [ADA] requirements) and HAC compliance for magnetic coupling to approved HAC hearing aids
- G.711 and G.729a audio compression
- An IP address assignment—DHCP client or statically configured
- Comfort noise generation and voice activity detection (VAD) programming on a system basis

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The phone also includes the following settings:

- Display contrast
- Ring type
- Network configuration
- Call status

Specifications

- Download firmware changes from Cisco CallManager and CCO
- Dimensions: 8 x 10.5 x 6 in. (20.32 x 26.67 x 15.24 cm) (H x W x D)
- Phone weight: 3.5 lb (1.6 kg)
- Polycarbonate acrylonitrile butadiene styerene (PABS) plastic in textured dark gray color with silver bezel
- 48 VDC required, supplied locally at the desktop using an optional AC to DC power supply (CP-PWR-CUBE=)

Also requires one of the following country cords:

CP-PWR-CORD-NA (North America)

CP-PWR-CORD-CE (Central Europe)

CP-PWR-CORD-UK (United Kingdom)

CP-PWR-CORD-AU (Australia)

CP-PWR-CORD-JP (Japan)

CP-PWR-CORD-AR (Argentina)

CP-PWR-CORD-AP (Asia Pacific)

CP-PWR-CORD-SW (Switzerland)

Temperature

Operating temperature: 32 F to 104 F (0 C to 40 C)

Relative humidity: 10 percent to 95 percent (noncondensing)

Storage temperature: 14 F to 140 F (–10 C to 60 C)

Certification

Regulatory Compliance

CE Marking

Safety

Underwriters Laboratories (UL) 60950

Canadian Standards Association (CSA) C22.2 No. 60950

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Electro-Magnetic Compatibility (EMC)

Federal Communications Commission (FCC) Part 15 (CFR 47) Class B

ICES-003 Class B

EN55022 Class B

CISPR22 Class B

AS/NZ 3548 Class B

VCCI Class B

EN55024

EN 50082-1

EN 61000-3-2

EN 61000-3-3

Telecom

FCC Part 68 (CFR47) hearing aid compatible (HAC)

IC CS-03

Ordering Information

Ordering has become to complex to place the order code numbers. Note that “All Cisco IP Phones require the purchase of a phone technology license, regardless of the call protocol server phone is attached to”.

Optional Accessories

Optional universal wall mount kits in locking and non-locking versions are available:

- CP-LCKNG-WALLMOUNT= and CP-WALLMOUNTKIT=
- Optional 14 button add on module CP-7914= provides 14 additional buttons for programming directory numbers (DN) or speed dials or a combination of the 2 Up to two 7914 modules can be used on the 7960G.

Warranty

Cisco IP Phones are covered by a Cisco standard one year replacement warranty.

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Cisco IP Communications Services and Support

Cisco IP Communications services and support reduce the cost, time, and complexity associated with implementing a converged network. Cisco and its partners have designed and deployed some of today's largest and most complex IP Communications networks—which means that they understand how to integrate an IP Communications solution into your network.

Cisco design tools and best practices ensure the solution best fits your business needs from the start, eliminating costly redesigns and downtime. Our proven methods ensure a sound implementation that will deliver the functions and features you expect—on time. Support services include remote network operations, network management tools to administer the converged application and network infrastructure, and technical support services.

Through these services, your organization benefits from the experience gained by Cisco and its partners. Leveraging this valuable experience, you can create and maintain a resilient converged network that will meet your business needs today—and in the future.

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SD/LW3925 01/03

Cisco Gigabit Interface Converter

The industry-standard Cisco Gigabit Interface Converter (GBIC) is a hot-swappable input/output device that plugs into a Gigabit Ethernet port or slot, linking the port with the network. Cisco GBICs can be interchanged on a wide variety of Cisco products and can be intermixed in combinations of 1000BASE-T, 1000BASE-SX, 1000BASE-LX/LH, 1000BASE-ZX, or 1000BASE-CWDM interfaces on a port-by-port basis.

As additional capabilities are developed, these modules make it easy to upgrade to the latest interface technology, maximizing investment protection. Figure 1 shows three Cisco GBIC models.

Figure 1
Cisco Gigabit Interface Converters]

Cisco 1000BASE-T GBIC

The Cisco 1000BASE-T GBIC (product number WS-G5483) connects a GBIC port to Category 5 wiring via a standard RJ-45 interface. The maximum Category 5 wiring distance is 328 feet (100 meters). For details, see the *Cisco 1000BASE-T Gigabit Interface Converter Data Sheet*.

Cisco 1000BASE-SX GBIC

The Cisco 1000BASE-SX GBIC (WS-G5484) operates on ordinary multimode fiber (MMF) optic link spans up to 1815 feet (550 m) long.

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Cisco 1000BASE-LX/LH GBIC

The Cisco 1000BASE-LX/LH GBIC (WS-G5486) fully complies with the IEEE 802.3z 1000BASE-LX standard. However, its higher optical quality allows it to reach 6.2 miles (10 kilometers) over single-mode fiber (SMF), compared with the 3.1 miles (5 km) specified in the standard.

Cisco 1000BASE-ZX GBIC

The Cisco 1000BASE-ZX GBIC (WS-G5487) operates on ordinary single-mode fiber optic link spans up to 43.4 miles (70 km) long. Link spans of up to 62 miles (100 km) are possible using premium single-mode fiber or dispersion shifted single-mode fiber. The GBIC provides an optical link budget of 23 dB—the precise link span length will depend on multiple factors such as fiber quality, number of splices, and connectors.

When shorter distances of single-mode fiber are used, it might be necessary to insert an in-line optical attenuator in the link to avoid overloading the receiver:

- A 5-dB or 10-dB inline optical attenuator should be inserted between the fiber-optic cable plant and the receiving port on the Cisco 1000BASE-ZX GBIC at each end of the link whenever the fiber-optic cable span is less than 15.5 miles (25 km).

Technical Specifications

This section covers the Cisco 1000BASE-SX GBIC, Cisco 1000BASE-LX/LH GBIC, and the Cisco 1000BASE-ZX GBIC, unless otherwise specified. Technical specifications for the Cisco 1000BASE-T GBIC can be found in a separate document, *Cisco 1000BASE-T Gigabit Interface Converter Data Sheet*.

Platform Support

Cisco GBICs are supported across a variety Cisco switches, routers, and optical transport devices. For more details, see the document *GBIC Compatibility Matrix*.

Connectors and Cabling

Connectors: Dual SC connector

Table 1 provides cabling specifications for the Cisco GBICs that you install in the Gigabit Ethernet port. Note that all Cisco GBICs have SC-type connectors, and the minimum cable distance for all GBICs listed (multimode fiber [MMF] and single-mode fiber [SMF]) is 6.5 feet (2 m).

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Table 1 Cisco GBIC Port Cabling Specifications

GBIC	Wavelength (nm)	Fiber type	Coresize (micron)	Modal bandwidth (MHz/km)	Cable distance
Cisco 1000BASE-SX	850	MMF	62.5	160	722 ft (220 m)
			62.5	200	902 ft (275 m)
			50.0	400	1640 ft (500 m)
			50.0	500	1804 ft (550 m)
Cisco 1000BASE-LX/LH	1300	MMF[1]	62.5	500	1804 ft (550 m)
			50.0	400	1804 ft (550 m)
		SMF	50.0	500	1804 ft (550 m)
			9/10	N/A	6.2 miles (10 km)
Cisco 1000BASE-ZX	1550	SMF	9/10	N/A	43.4 to 62 miles (70 to 100 km)[2]

1. Mode-conditioning patch cord (CAB-GELX-625 or equivalent) is required. Using an ordinary patch cord with MMF, 1000BASE-LX/LH GBICs, and a short link distance (10s of meters) can cause transceiver saturation resulting in an elevated bit error rate (BER). In addition, when using the Cisco 1000BASE-LX/LH GBIC with 62.5-micron diameter MMF, you must install a mode-conditioning patch cord between the GBIC and the MMF cable on both the transmit and receive ends of the link. The mode-conditioning patch cord is required for link distances greater than 984 feet (300 m).

2. Cisco 1000BASE-ZX GBIC can reach up to 62 miles (100 km) by using dispersion shifted SMF or low-attenuation SMF; the distance depends on fiber quality, number of splices, and connectors.

Note: A mode-conditioning patch cord (product number CAB-GELX-625 or equivalent) is required to comply with IEEE standards. The IEEE found that link distances could not be met with certain types of fiber-optic cable cores. The solution is to launch light from the laser at a precise offset from the center, which is accomplished by using the mode-conditioning patch cord. At the output of the patch cord, the Cisco 1000BASE-LX/LH GBIC is compliant with the IEEE 802.3z standard for 1000BASE-LX.

Standards

Compatible with GBIC standard as specified in IEEE 802.3z

Compliant with GBIC Specification Revision 5.4

Table 2 Fiber Loss Budgets for 1000BASE-SX, 1000BASE-LX, and 1000BASE-ZX

Device	Type	Transmit (dBm)		Receive (dBm)	
		Max	**Min**	**Max**	**Min**
WS-G5484	1000BASE-SX	–4	–9.5	0	–17
WS-G5486	1000BASE-LX/LH	–3	–9.5	–3	–19
WS-G5487	1000BASE-ZX	5	0	–3	–23[1]

1. The WS-G5487 1000BASE-ZX GBIC provides a minimum optical power budget of 23 dB. To determine the supported link distance you should measure your cable plant with an optical loss test set to verify that the optical loss of the cable plant (including connectors and splices) is less than or equal to this figure. The optical loss measurement must be performed with a 1550-nanometer light source.

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Dimensions

Dimensions (H x W x D): 8.5 mm x 13.4 mm x 56.5 mm

Environmental Conditions and Power Requirements

The operating temperature range is 32 to 122 F (0 to 50 C)

Storage temperature range is –40 to 185 F (–40 to 85 C).

Table 3 Electrical Power Interface

Parameter	Symbol	Minimum	Typical	Maximum	Units
Supply current	I_S	—	200	300	mA
Supply voltage	I_{max}	—	—	6	—
Surge current	I_{SURGE}	—	—	30	mA
Input voltage	V_{CC}	4.75	5	5.25	V

Warranty

- Standard warranty: 90 days
- Extended warranty (option): Available under a Cisco SMARTnet™ support contract for the Cisco switch or router chassis

Ordering Information

Table 4 lists product numbers to use when ordering Cisco GBICs.

Table 4 Cisco GBIC Product Numbers

GBIC	Product number
Copper (Cisco 1000BASE-T)	WS-G5483
Short wavelength (1000BASE-SX)	WS-G5484
Long wavelength/long haul (1000BASE-LX/LH)	WS-G5486
Extended distance (1000BASE-ZX)	WS-G5487

Regulatory and Standards Compliance

Safety—Laser Class I 21CFR1040

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For More Information

For additional information about the Cisco Coarse Wavelength-Division Multiplexing (CWDM) GBIC Solution contact:

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KC/LW4171 02/03

Catalyst 3508G XL Stackable Gigabit Ethernet Switch

The Catalyst® 3508G XL eight-port stackable Gigabit Ethernet switch is a member of the Cisco Systems Catalyst 3500 Series XL, a scalable line of stackable 10/100 and Gigabit Ethernet switches that delivers best-in-class performance, manageability, and flexibility with unparalleled investment protection.

The Catalyst 3508G XL switch features eight Gigabit Interface Converter (GBIC)-based 1000Base-X ports and a 10-Gbps switching fabric. These features make this switch ideal for either high speed wiring closet stack aggregation or a distribution layer Gigabit Ethernet aggregation switch. The switch is easy to deploy, either on a desktop or in a wiring closet, and features Cisco IOS® software support. Administration of the Cisco desktop Catalyst switches is made even more convenient via Cisco Switch Clustering technology.

Figure 1 The Catalyst 3508G XL is a single RU, stackable Gigabit Ethernet switch with eight GBIC-based Gigabit Ethernet ports. The Catalyst 3508G XL is ideal for aggregating a group of 10/100 and Gigabit Ethernet switches and Gigabit Ethernet servers through Cisco GigaStack™ GBICs or standard 1000Base-X GBICs.

Flexible Stacking with GigaStack Stacking GBIC

The Catalyst 3500 Series XL and Gigabit Ethernet-enabled Catalyst 2900 Series XL switches can be stacked using the low-cost Cisco GigaStack GBIC. The GigaStack GBIC offers a range of highly flexible stacking and performance options. Customers can connect up to nine switches in a star configuration with up to 5-Gbps of stack bandwidth using the Catalyst 3508G Gigabit Ethernet aggregation switch. Network managers may use available GBIC ports to create high-speed uplinks to the network core using standard Gigabit Ethernet or Gigabit EtherChannel® technologies. The GBIC ports support all Cisco GBICs including 1000Base-T, 1000Base-SX, 1000Base-LX/LH, and 1000Base-ZX providing exceptional flexibility for Gig-based network designs. High resiliency can also be implemented by deploying dual redundant Gigabit Ethernet uplinks, Uplink Fast and Cross-Stack Uplink Fast technologies for high-speed uplink and stack interconnection failover, and per VLAN Spanning Tree (PVST+) for uplink load balancing. This Gigabit Ethernet flexibility makes the Catalyst 3500 series XL an ideal complement to the Cisco Catalyst 6500 family of Gigabit Ethernet optimized core LAN switches, and allows today's customer investments to be used in various price-to-performance configurations overtime.

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Cisco Switch Clustering

Breakthrough Cisco Switch Clustering technology enables up to sixteen interconnected Catalyst 3500 Series XL, 2900 Series XL, and Catalyst 1900 switches, regardless of geographic proximity, to form a single IP management domain. Cisco Switch Clustering technology supports a broad range of standards-based connectivity options and configurations to deliver levels of performance that are scalable to meet customer requirements. Switch cluster connectivity options for the Catalyst 3500 Series XL include Ethernet, Fast Ethernet, Fast EtherChannel, low-cost Cisco GigaStack GBIC, Gigabit Ethernet, and Gigabit EtherChannel connectivity. Because the technology is not limited by proprietary stacking modules or stacking cables, Cisco Switch Clustering expands the traditional stacking domain beyond a single wiring closet and lets users mix and match interconnections to meet specific management, performance, and cost requirements. Cisco Switch Clustering can be accessed via an embedded Web interface, allowing network administrators to configure, monitor, and manage a switch cluster from anywhere on the network through a standard browser such as Internet Explorer or Netscape Navigator. Catalyst 3500 XL switches can be configured either as command or member switches in a Cisco switch stack or cluster. The command switch serves as the single IP address management point and disburses all management action dictated by the network administrator. Command switches can cluster up to fifteen additional interconnected member switches, regardless of interconnection media. The Catalyst 3508G XL is an optimal command switch when deployed as a high-performance aggregator.

Quality of Service

All Catalyst 3500 Series XL switches support LAN edge quality of service (QoS) based on 802.1p class of service (CoS), as well as port-based prioritization. CoS is used for tagged packets while port-based prioritization is used for untagged packets. Priority scheduling is applied between the queues, which will assure that the high priority queue is always serviced before scheduling the low priority traffic. These features enable users to prioritize mission critical traffic, such as VoIP or ERP applications over regular traffic (such as FTP or generic Web traffic).

Software Management Features

Cisco Catalyst 3500 Series XL switches include several exceptional features to increase network performance, manageability, and security. In order to boost performance, Fast EtherChannel and Gigabit EtherChannel technology offer from 400-Mbps to 4-Gbps high-performance bandwidth between Catalyst switches, routers, and servers. The Cisco Group Management Protocol (CGMP) enhances performance of multimedia applications and reduces network traffic by allowing a switch to selectively and dynamically forward IP multicast traffic to targeted end stations.

Users can also implement higher levels of data security and boost LAN performance by deploying up to 250 virtual LANs (VLANs) per switch. This ensures that data packets are forwarded only to stations within a specific VLAN, creating a virtual firewall between groups of ports on the network and reducing broadcast transmission. VLAN trunks can be created from any port using either 802.1Q trunking or the Cisco Inter-Switch Link (ISL) VLAN architecture. VLANs using standards-based 802.1Q and ISL trunking provide broadcast control and enhanced security, and simplify adds, moves, and changes. PVST+ allows users to implement redundant uplinks while also distributing traffic loads across multiple links—not possible with standard STP implementations. Cisco Uplink Fast technology ensures immediate transfer to the secondary uplink. Cross-Stack Uplink Fast (CSUF) technology provides increased redundancy and network resiliency through fast-spanning tree convergence (less than two seconds) across a stack of switches using Gigastack GBICs.

With the Catalyst 3500 Series XL, network managers can implement high levels of port and console security. Media access control (MAC) address-based port level security prevents unauthorized stations from accessing the switch. Multilevel access security on the switch console prevents unauthorized users from accessing or altering switch configuration. Terminal access controller access control system (TACACS+) authentication enables centralized access control of the switch and restricts unauthorized users from altering the configuration.

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Key Features/Benefits

Exceptional Performance

- Eight GBIC-based Gigabit Ethernet ports deliver up to 5-Gbps aggregated forwarding bandwidth to a switch cluster
- 10-Gbps switching fabric and 7.0 million packets-per-second forwarding rate
- 4 MB shared-memory architecture ensures the highest possible throughput, with a design that eliminates head-of-line blocking, minimizes packet loss, and delivers better overall performance in environments with extensive multicast and broadcast traffic
- Full-duplex operation on all ports delivers up to 2-Gbps on 1000Base-X ports
- Dual-priority forwarding queues on each Gigabit Ethernet port through IEEE 802.1p protocol enable prioritization of mission critical and time sensitive traffic from data, voice, and telephony applications
- Trusted extension settings allows the switch to set trusted port settings for the PC port on Cisco IP phones, ensuring voice traffic receives highest priority
- Bandwidth aggregation up to 4 Gbps through Gigabit EtherChannel technology enhances fault tolerance and offers higher-speed aggregated bandwidth between switches, and to routers and individual servers
- A configurable network port supports unlimited MAC addresses for backbone connectivity
- GigaStack GBIC delivers a low-cost hardware-based, independent stack bus with up to 1-Gbps forwarding bandwidth in a cascade configuration (up to nine Catalyst 3500 XL or gigabit-enabled Catalyst 2900 Series XL switches) or 2-Gbps forwarding rate in a point-to-point configuration
- GBIC-based Gigabit Ethernet ports give customers a choice of 1000Base-T, 1000Base-SX, 1000Base-LX/LH, 1000Base-ZX, or Cisco GigaStack GBICs to fit their connection needs
- Per-port broadcast, multicast, and unicast storm control prevents faulty end stations from degrading overall systems performance

Flexible and Scalable Switch Clustering Architecture

- Cisco Switch Clustering technology allows the user to manage up to sixteen interconnected Catalyst 3500 XL, 2900 XL, and Catalyst 1900 switches through a single IP address, regardless of location
- Common Switch Redundancy allows customers to designate a backup command switch, which takes over cluster management functions in the event of a failure of the primary command switch

Ease of Use and Ease of Deployment

- The cluster software administration feature allows a network manager to quickly and easily upgrade the system software on a group of Catalyst 3500 XL, and 2900 XL, and Catalyst 1900 switches
- IEEE 802.3z-compliant 1000Base-T, 1000Base-SX, 1000Base-LX/LH, and 1000Base-ZX physical-interface support through a field-replaceable GBIC module provides customers unprecedented flexibility in switch deployment
- Autoconfiguration eases deployment of switches in the network by automatically configuring multiple switches across a network via a boot server
- Default configuration stored in Flash memory ensures that the switch can be quickly connected to the network and can pass traffic with minimal user intervention, preserving the configuration in case of a power outage
- Voice VLAN creates a new subnet for use by IP phones in cases where there are not enough free IP addresses in the existing subnets

Integrated Cisco IOS Switching Solution

- Cisco Group Management Protocol (CGMP) enables a switch to selectively and dynamically forward routed IP multicast traffic to targeted multimedia end stations, reducing overall network traffic
- CGMP Fast Leave allows end stations to quickly exit from a multicast session, reducing superfluous traffic on the network
- Virtual LAN trunks can be created from any port using either standards-based 802.1Q tagging or the Cisco ISL VLAN architecture
- IEEE 802.1p Layer 2 prioritization protocol allows users to assign data packets to prioritized forwarding queues

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- Cisco Virtual Trunking Protocol (VTP) supports dynamic VLANs and dynamic trunk configuration across all switches
- Command-Line-Interface (CLI) support provides common user interfaces and command sets across all Catalyst series switches and Cisco routers
- Cisco Discovery Protocol (CDP) enables a CiscoWorks network management station to automatically discover the switch in a network topology

Superior Manageability

- Built-in Web-based Cisco Cluster Management Suite (CSM) software provides an easy-to-use Web-based management interface through a standard browser such as Netscape Navigator or Microsoft Explorer
- Simple Network Management Protocol (SNMP) and Telnet interface support delivers comprehensive in-band management, and a CLI-based management console provides detailed out-of-band management
- Manageable through CiscoWorks2000 network management software on a per-port and per-switch basis, providing a common management interface for Cisco routers, switches, and hubs
- 8 MB DRAM and 4 MB Flash memory on board enable the addition of a continuous stream of feature upgrades, maximizing customer investments
- Embedded Remote Monitoring (RMON) software agent supports four RMON groups (History, Statistics, Alarms, and Events) for enhanced traffic management, monitoring, and analysis
- Support for all nine RMON groups through use of a Switch Port Analyzer (SPAN) port that permits traffic monitoring of a single port, a group of ports, or the entire switch from a single network analyzer or RMON probe
- Domain Name System (DNS) client support provides IP address resolution with user-defined device names
- Trivial File Transfer Protocol (TFTP) reduces the cost of administering software upgrades by downloading from a centralized location
- Network Time Protocol (NTP) provides an accurate and consistent timestamp to all switches within the intranet
- Multifunction LEDs per port for port status, half-duplex/full-duplex indication, switch-level status LEDs for system, redundant power supply (RPS), and bandwidth utilization provide a comprehensive and convenient visual management system
- Spanning Tree Root Guard (STRG) prevents devices not in the network administrator's or service provider's control from becoming STP root nodes by configuring STRG on device ports it does control
- VTP pruning limits broadcasts on VTP trunks. When VTP pruning is enabled, broadcast traffic is flooded only on trunk links required to reach the destination devices

Redundancy

- Cisco Uplink Fast technology ensures quick failover recovery, enhancing overall network stability and reliability
- Cross-Stack Uplink Fast (CSUF) technology provides increased redundancy and network resiliency through fast-spanning-tree convergence (less than two seconds) across a stack of switches using Gigastack GBICs
- IEEE 802.1D Spanning-Tree Protocol support for redundant backbone connections and loop-free networks simplifies network configuration and improves fault tolerance
- Redundant stacking connections support for a redundant loopback connection in top and bottom switches in a stack
- Support for optional Cisco 600-watt redundant AC power system provides a backup power source for up to four units for improved fault tolerance and network uptime

Security

- Support for TACACS+ authentication enables centralized control of the switch and restricts unauthorized users from altering the configuration
- MAC-based port-level security prevents unauthorized stations from accessing the switch
- User-selectable address learning mode simplifies configuration and enhances security
- Multilevel security on console access prevents unauthorized users from altering the switch configurations

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- Private VLAN edge provides security and isolation between ports on a switch, ensuring that voice traffic travels directly from its entry point to the aggregation device through a virtual path and cannot be directed to a different port

Technical Specifications

Performance

- 10-Gbps shared memory switching fabric with 5-Gbps peak forwarding bandwidth
- 7.5-Mpps wire-speed forwarding rate for 64-byte packets
- 4 MB memory architecture shared by all ports
- Packet forwarding rate for 64-byte packets: 1,488,000 pps to 1000Base-X ports
- 8 MB DRAM and 4-MB Flash memory
- 8192 MAC addresses

Management

- SNMP Management Information Base (MIB) II, SNMP MIB extensions, bridging MIB (RFC 1493)

Standards

- IEEE 802.3x full duplex
- IEEE 802.1D Spanning-Tree Protocol
- IEEE 802.1p Class of Service Protocol
- IEEE 802.1Q VLAN
- IEEE 802.3z, IEEE 802.3x 1000Base-X specification
- 1000Base-X (GBIC)
  - 1000Base-T
  - 1000Base-SX
  - 1000Base-LX/LH
  - 1000Base-ZX (4 GBICs supported per switch)
- IEEE 802.3ab

Y2K

- Y2K compliant

Connectors and Cabling

- 1000Base-T GBIC ports: RJ-45 connectors; two-pair Category 5 UTP cabling
- 1000Base-SX, -LX/LH, and -ZX GBIC-based ports: SC fiber connectors, single-mode or multimode fiber
- GigaStack GBIC ports: copper-based Cisco GigaStack cabling
- Management console port: RJ-45 connector, EIA/TIA-232 serial cabling

Indicators

- Per-port status LEDs—link integrity, disabled, activity, speed, and full-duplex indications
- System status LEDs—system, RPS, and bandwidth-utilization indications

Dimensions and Weight (H x W x D)

- 1.75 x 17.5 x 16 in. (4.4 x 44.5 x 40.6 cm)
- One rack-unit (RU) high
- 12 lb (5.4 kg)

Environmental Conditions and Power Requirements

- Operating temperature: 32 to 113 F (0 to 45 C)
- Storage temperature: –13 to 158 F (–25 to 70 C)
- Operating relative humidity: 10 to 85% noncondensing
- Operating altitude: up to 10,000 ft (3000 m)
- Power consumption: 70W maximum; 239 BTU per hour
- AC input voltage/frequency: 100 to 120/200 to 240 VAC (autoranging) 50 to 60 Hz
- MTBF 150,000 hours

Safety Certifications

- UL 1950
- CSA 22.2 No. 950
- EN 60950
- IEC 950
- AS/NZS 3260, TS001
- CE marking

Electromagnetic Emissions Certifications

- FCC Part 15 Class A
- EN 55022B Class A (CISPR 22 Class A)
- VCCI Class A
- AS/NZS 3548 Class A
- BCIQ
- CE marking

Warranty

- Limited lifetime warranty

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Ordering Information

Model Numbers

- WS-C3508G-XL-EN (8-port 1000Base-X, Enterprise Edition)

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- Europe: 32 2 778 4242
- Australia: 612 9935 4107
- Other: 408 526-7209
- World Wide Web URL: http://www.cisco.com

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01/01 BW6939

Data Sheet

Cisco IP Phone 7940G

As the market leader in true IP Telephony, Cisco continues to deliver unsurpassed end-to-end data and VoIP solutions, offering the most complete, stylish, fully featured IP Phone portfolio to enterprise and small-to-medium sized customers. Cisco IP phones provide unmatched levels of integrated business functionality and converged communications features beyond today's conventional voice systems.

The Cisco IP phone family includes phones with large pixel-based displays to bring productivity enhancing applications to the phone, as well as customization options that can be modified as needs change, and provide inline power support over Ethernet. The Cisco IP Phone 7940G is multi-protocol enabled' supporting Session Initiated Protocol (SIP), Media Gateway Control Protocol (MGCP), as well as Cisco's CallManager Skinny Client Control Protocol (SCCP).

The Cisco IP Phone 7940G, a key offering in the IP Phone portfolio, addresses the communication needs of a transaction type worker. It provides two programmable line and feature keys, plus a high quality speakerphone. The Cisco IP Phone 7940G also has four dynamic soft keys that guide users through call features and functions. Built-in headset port and integrated Ethernet Switch are standard with the Cisco IP Phone 7940G. Also includes audio controls for full duplex speakerphone, handset and headset. The Cisco IP Phone 7940G also features a large, pixel-based LCD display. The display provides features such as date and time, calling party name, calling party number, and digits dialed.

Cisco IP Phone 7940G

Icon buttons

With Word Overlay, English (Included in documentation package with each phone)

Figure 1

Cisco IP Phone 7940G

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The graphic capability of the display allows for the inclusion of such features as XML (Extensible Markup Language) and future features. The 7940G is multi-protocol capable (SCCP, SIP, MGCP).

Features

The Cisco 7940G is dynamic and designed to grow with system capabilities. Features will keep pace with new changes via software updates to the phone's flash memory. The phone provides many accessibility methods according to user preference. Various methods or paths include buttons, softkeys, a navigation key, and direct access with the use of corresponding "ghost" digits. Each of the features below will have expanded capabilities in the future:

Messages—

Direct access to voice mail. In the near future voice mail speech to text readout on the display.

Directories—

The Cisco IP Phone 7940G identifies incoming messages and categorizes them for users on the screen. This allows users to quickly and effectively return calls using direct dial-back capability.

The corporate directory integrates with the Lightweight Directory Access Protocol (LDAP3) standard directory.

Settings—

The Settings feature key allows the user to adjust display contrast and select from a large number of unique ringer sounds, volume settings for all audio such as ringer, handset, headset, and speaker. Network Configuration preferences can also be set up. (Network configuration is usually set up by the System Administrator.) Configuration can either be automatic or manually set up for Dynamic Host Control Protocol (DHCP), Trivial File Transfer Protocol (TFTP), CallManager, and backup CallManagers.

A huge advantage is the ability for no hands on moves and changes. Just pick up the phone and move to the new location anywhere on your network. No system administration is required.

Services—

The Cisco 7940G allows users to quickly access diverse information such as weather, stocks, quote of the day, or any Web-based information using extensible markup language (XML) to provide a portal to an ever-growing world of features and information.

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Help—

The online help feature gives users information about the phone's keys, buttons, and features. The pixel display allows for greater flexibility of features and significantly expands the information viewed when using features such as Services, Information, Messages, and Directory. For example, the Directory button can show local and server-based directory information.

The Cisco IP Phone 7940G features high-quality, speakerphone technology. It also includes an easy-to-use speaker on/off button and microphone mute buttons. These buttons are lit when active.

The internal Cisco two-port Ethernet switch allows for a direct connection to a 10/100BASE-T Ethernet network via an RJ-45 interface with single LAN connectivity for both the phone and a co-located PC. The system administrator can designate separate virtual LANs (VLANs) (802.1Q) for the PC and Cisco IP Phones providing improved security and reliability of voice and data traffic.

A dedicated headset port eliminates the need for a separate amplifier when using a headset. This allows the handset to remain in its cradle, making headset use simpler. The Cisco IP phone’s convenient volume control button provides for easy decibel-level adjustments for the speakerphone, handset, headset, and ringer. The handset is Hearing Aid Compatible (HAC) and meets FCC loudness requirements for Americans with Disabilities Act (ADA). Section 508 loudness requirements can be achieved using industry standard inline handset amplifiers such as Walker Equipment W-10 or CE-100 amplifiers.

The dial pad is also ADA compliant.

The footstand of the Cisco 7940G is adjustable from flat to 60 degrees to provide optimum display viewing and comfortable use of all buttons and keys. The footstand is keyed to match standard wall jack configurations for wall mounting. Two optional wall mount brackets are also offered as noted below.

The Cisco IP Phone 7940G can also receive power down the LAN from any of the Cisco inline power-capable blades and boxes.

For added security, the audible dual-tone multifrequency (DTMF) tones are masked when the speakerphone mode is used.

Other Cisco IP Phone 7940G features include:

- 24+ user-adjustable ring tones
- A hearing-aid-compatible handset (meets American Disabilities Act [ADA] requirements) and HAC compliance for magnetic coupling to approved HAC hearing aids
- G.711 and G.729a audio compression
- H.323 compatible and Microsoft NetMeeting compatibility
- An IP address assignment—DHCP client or statically configured
- Comfort noise generation and voice activity detection (VAD) programming on a system basis

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The phone also includes the following settings:

- Display contrast
- Ring type
- Network configuration
- Call status

Specifications

- Download firmware changes from Cisco CallManager and CCO
- Dimensions: 8 x 10.5 x 6 in. (20.32 x 26.67 x 15.24 cm) (H x W x D)
- Phone weight: 3.5 lb (1.6 kg)
- Polycarbonate acrylonitrile butadiene styerene (PABS) plastic in textured dark gray color with silver bezel
- 48 VDC required, supplied locally at the desktop using an optional AC to DC power supply (CP-PWR-CUBE=)

Also requires one of the following country cords:

CP-PWR-CORD-NA (North America)

CP-PWR-CORD-CE (Central Europe)

CP-PWR-CORD-UK (United Kingdom)

CP-PWR-CORD-AU (Australia)

CP-PWR-CORD-JP (Japan)

CP-PWR-CORD-AR (Argentina)

CP-PWR-CORD-AP (Asia Pacific)

CP-PWR-CORD-SW (Switzerland)

Temperature

Operating temperature: 32 F to 104 F (0 C to 40 C)

Relative humidity: 10 percent to 95 percent (noncondensing)

Storage temperature: 14 F to 140 F (–10 C to 60 C)

Certification

Regulatory Compliance

CE Marking

Safety

Underwriters Laboratories (UL) 60950

Canadian Standards Association (CSA) C22.2 No. 60950

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Electro-Magnetic Compatibility (EMC)

Federal Communications Commission (FCC) Part 15 (CFR 47) Class B

ICES-003 Class B

EN55022 Class B

CISPR22 Class B

AS/NZ 3548 Class B

VCCI Class B

EN55024

EN 50082-1

EN 61000-3-2

EN 61000-3-3

Telecom

FCC Part 68 (CFR47) hearing aid compatible (HAC)

IC CS-03

Ordering Information

Ordering has become to complex to place the order code numbers. Note that "All Cisco IP Phones require the purchase of a phone technology license, regardless of the call protocol server phone is attached to".

Optional Accessories

Optional universal wall mount kits in locking and non-locking versions are available:

- CP-LCKNG-WALLMOUNT= and CP-WALLMOUNTKIT=

Warranty

Cisco IP Phones are covered by a Cisco standard one year replacement warranty.

Cisco IP Communications Services and Support

Cisco IP Communications services and support reduce the cost, time, and complexity associated with implementing a converged network. Cisco and its partners have designed and deployed some of today's largest and most complex IP Communications networks—which means that they understand how to integrate an IP Communications solution into your network.

Cisco design tools and best practices ensure the solution best fits your business needs from the start, eliminating costly redesigns and downtime. Our proven methods ensure a sound implementation that will deliver the functions and features you expect—on time. Support services include remote network operations, network management tools to administer the converged application and network infrastructure, and technical support services.

Through these services, your organization benefits from the experience gained by Cisco and its partners. Leveraging this valuable experience, you can create and maintain a resilient converged network that will meet your business needs today—and in the future.

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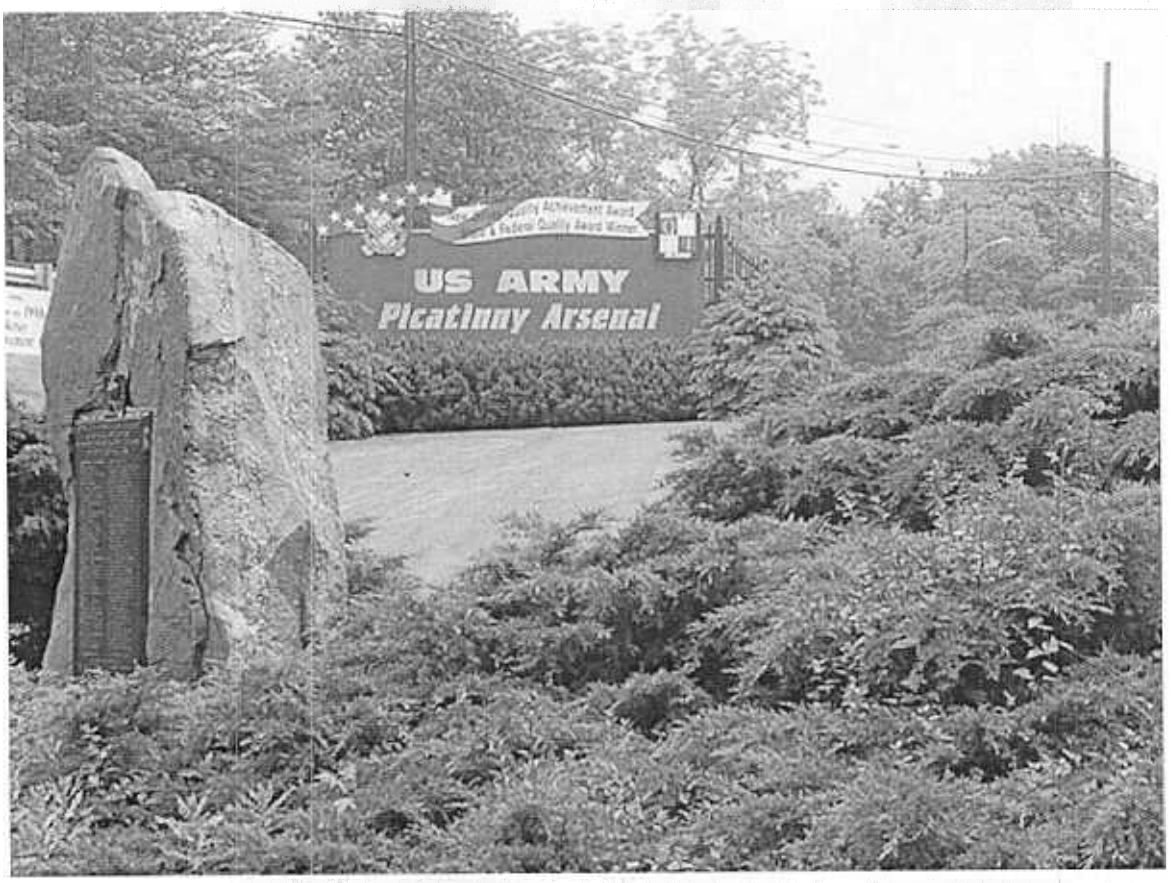
SD/LW3925 01/03

ATTACHMENT S

Picatinny Arsenal Water Treatment Facility
Report on Water Quality
Drinking Water Consumer Confidence Report
2003



Picatinny Water Treatment Facility
Building 1383
Picatinny Arsenal, NJ 07086

Prepared by:

Robert J. Smith
Project Manager/Licensed Operator of Record
U.S. Filter Operating Services

June 13, 2003

Dear Picatinny Arsenal Water Consumers:

In 1996, Congress amended the Safe Drinking Water Act. It added a provision requiring that all community water systems serving at least fifteen residential service connections year round deliver to their customers a brief annual Drinking Water Consumer Confidence Report (CCR). CCR's summarize information that your water system already collects to comply with regulations. This CCR is an annual report which includes information on your source water, the levels of any detected contaminants, compliance with drinking water rules, plus some educational information.

The Picatinny Arsenal Water Treatment Facility is pleased to inform you that the quality of water provided to you throughout Year 2002 met all federal and state drinking water regulations. We did however receive a Notice of Violation from the NJDEP concerning Nitrate/Nitrite sampling which is further explained in section 5 (Compliance with other Drinking Water Regulations).

We are committed to providing you with safe, reliable, high quality drinking water that you expect and deserve. USFilter is pleased to serve you and to keep you informed about the drinking water quality here at Picatinny Arsenal.

Sincerely,

Robert J. Smith
Project Manager/Licensed Operator of Record
U.S. Filter Operating Services

1. WATER SYSTEM INFORMATION:

Picatinny Arsenal Drinking Water System

- Name/phone number of contact person(s).
  Robert J. Smith (Licensed Operator) (973) 366-9339
  Carl Appelquist (Army Environmental) (973) 724-5517

- **INFORMATION ON PUBLIC PARTICIPATION OPPORTUNITIES:**
  Individuals can obtain information of the water issues/decisions affecting water quality through their environmental coordinator and/or the Environmental Affairs Office.

Why There May Be Contaminants in the Water
As water travels over the surface of land or through the ground it dissolves naturally occurring minerals and, in some cases, radioactive material. It can also pick up substances resulting from the presence of animals or human activity. The following is a list of contaminants that may be present in source water.

MICROBIAL CONTAMINANTS - such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

INORGANIC CONTAMINANTS - such as salts and metals, which can be naturally occurring or result from urban runoff, industrial or domestic wastewater discharges, oil and gas production, or farming.

PESTICIDES AND HERBICIDES - which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.

ORGANIC CHEMICAL CONTAMINANTS - including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production and can also come from gas stations, urban stormwater runoff, and septic systems.

RADIOACTIVE CONTAMINANTS - which can be naturally occurring or be the result of oil and gas production and mining activities.

ENSURING WATER QUALITY

Here at Picatinny Arsenal Water Treatment Facility, our staff monitors water quality from many sources on a daily basis. We also collect approximately 100 samples each year and send these samples to an EPA-approved, New Jersey certified laboratory to analyze your drinking water. Our personnel take samples from the distribution system and at consumer taps. Samples are then shipped to the lab where a full spectrum of water quality analyses is performed.

MONITORING OF YOUR DRINKING WATER

To comply with EPA regulations, our water system monitors for the contaminant groups listed below. In addition, we perform tests for pH, chlorine residual, and temperature. We also test on a daily basis for Iron and Manganese. All these tests assure us that the highest level of drinking water quality is maintained throughout the entire water distribution system.

ANALYTE/CONTAMINANT GROUP	MONITORING FREQUENCY
1. Biological Contaminants (Total Coliform)	5 samples Monthly
2. Trihalomethanes	1 sample every 3 years
3. Lead and Copper	20 samples every 3 years
4. Inorganic Contaminants	1 sample every 3 years.
5. Volatile Organic Compounds	Quarterly Stripper (Influent) Monthly Stripper (Effluent)
6. Nitrate/Nitrite (as Nitrogen)	Annually
Secondary Contaminants	1 sample every three years
8. Asbestos	Under Waiver
9. Radio Nuclides	1 sample every four years
10. Pesticides/SOC'S	Under Waiver
11. Radon	Quarterly Stripper (Influent)
12. Iron and Manganese	Daily for process control

2. SOURCES OF WATER

There are a total of 3 water wells that supply drinking water to the Arsenal.

Well 131:
This well is located just off Farley Avenue 100 feet southeast of building 117. The depth of this well is 177 feet and draws water from the glacial aquifer. This is our primary well.

Well 302D:
This well is located approximately 50 feet southeast of building 302. The depth of this well is 417 feet and it pumps groundwater from the bedrock aquifer system.

Well 410
This well is situated approximately 700 ft from the intersection of Buffington road and 17th street. The depth of the well is 108 feet and draws water from the glacial aquifer system.

To date, the Bureau of Safe Drinking Water has not completed an assessment for our sources of drinking water. Source Water Assessments will be completed for all sources of public drinking water systems serving populations between 3,300 and 50,000 must submit before June 30, 2004.

PICATINNY ARSENAL WATER TREATMENT
Groundwater pumped from the three community wells undergoes an extensive treatment process. First, the groundwater from the operating wells is pumped to a newly constructed holding/storage tank. From there it is gravity fed to the primary surge tank at the water plant where potassium permanganate is injected to the water prior to filtration. The water then passes through green sand filters to remove iron and manganese. Following sand filtration, the water is treated through an air-stripping tower to remove volatile organic compounds, and is then pumped to a secondary surge tank. Finally, soda ash is added for corrosion control, and chlorine is added for disinfection.

The water treatment plant has a design capacity of one million gallons of water per day but currently treats an average of 393,162 gallons of water per day. Over the past years, chemical feeders have been replaced, water storage tanks have been repaired and or replaced, new alarm systems have been installed, equipment has been automated, and general system maintenance has been conducted. These upgrades and repairs have totaled in excess of $1,000,000.

AVAILABILITY OF SOURCE WATER ASSESSMENT

Past industrial activities resulted in certain contaminants entering the groundwater systems supplying the Arsenal. Remediation efforts to clean up contamination have been extensive. These efforts include remedial investigation feasibility studies, groundwater contamination assessments, groundwater remediation, and surface water assessments.

INFORMATION ON POTENTIAL SOURCES OF CONTAMINATION

The installation has a combination of industrial and administrative support facilities, as well as residential facilities and recreational areas.

Potential sources of contamination consist of the following;

- Septic systems
- Abandoned wells
- Motor pool facilities that include vehicle maintenance shops, gas stations, vehicle wash racks, oil/water separators and storage buildings for fuels/petroleum, oil, lubricants and other flammable materials.
- Power generating facilities including transformer equipment areas
- Storage facilities that store batteries, explosives, fertilizer, insecticides, herbicides, hazardous waste and radioactive materials.
- Wastewater treatment facilities
- Golf courses
- Road de-icing.

3. DEFINITIONS

- **Maximum Contaminant Level (MCL)**

The highest level of a contaminant that is allowed in drinking water, MCL's, are set as close to the Maximum Contaminant Level Goal (MCLG) as feasible using the best available treatment technology.

- **Maximum Contaminant Level Goal (MCLG)**

The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLG's allow for a margin of safety.

- **Treatment Technique**

A required process intended to reduce the level of a contaminant in drinking water.

- **Action Level**

The concentration of a contaminant, which, if exceeded, triggers treatment or other actions that, a water system must follow.

- **Variances and Exemptions**

State or EPA permission not to meet an MCL or a treatment technique under certain conditions.

4. DETECTED CONTAMINANTS

A detected contaminant is any contaminant detected at or above its minimum detection limit (MDL). The EPA requires that this report show the **HIGHEST** level of each detected contaminant that is above the **MINIMUM** detection limit.

The following tables present the highest level of contaminants that registered above the Minimum Detection Limit for the reporting period. All units are in Parts Per Billion (ppb) unless otherwise stated. None of these contaminants exceeded the State or Federal Maximum Contaminant Level (MCL) for the Year 2001 reporting period.

Results Table – Detected Unregulated Contaminants

Contaminant	MCLG Treated Water	MCL Treated Water *	Our Result (ppb)	MDL (ppb)	Exceeded Standard MCL	Likely Source of Contaminant
Chloroform	N/A	N/A	0.42	0.3	No	Natural occurrence due to chlorination
Bromodichloro-methene	N/A	N/A	0.90	0.2	No	Natural occurrence due to chlorination
DiBromochloro-methene	N/A	N/A	1.45	0.2	No	Natural occurrence due to chlorination
Bromoform	N/A	N/A	0.62	0.3	No	Natural occurrence due to chlorination
2-Butanone	N/A	N/A	N/D	0.1	No	Leaking underground gasoline and fuel tanks. Gasoline and fuel spills or Lab contaminant
Acetone	N/A	N/A	11.9	0.3	No	Lab contaminant

Results Table – Regulated Contaminants

Contaminant	MCLG Treated Water	MCL Treated Water *	Our Result (ppb)	MDL (ppb)	Exceeded Standard MCL	Likely Source of Contaminant
Trichloroethene	0	1.0	0.360	0.2	No	Degreasing operations
Lead	N/A	AL = 0.015mg/l	.0064 mg/l	.002 mg/l	No	Corrosion of household plumbing systems; Erosions of natural deposits
Copper	N/A	AL = 1.3 mg/l	0.107 mg/l	0.01 mg/l	No	Corrosion of household plumbing systems; Erosions of natural deposits

***Report applicable State, Local, or Federal MCL, Treatment Technique, or Action Level value.**

TECHNICAL INFORMATION (Health Effects)
CCR's require a brief discussion of any contaminants that have an established MCL and register above Minimum Detection Level in the drinking water. Under these criteria, only trichloroethene needs to be discussed. CCR's also require an educational discussion of the effects of Cryptosporidium, radon, and other contaminants.

TRICHLOROETHENE – (Health Effects)
The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that trichloroethene is a health concern at certain levels of exposure. This chemical is a common metal cleaning and dry cleaning fluid. It generally gets into drinking water by improper waste disposal. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed to high levels over their lifetimes. Chemicals that cause cancer in laboratory animals may also increase the risk of cancer in humans that are exposed to lower levels over long periods of time. EPA has set forth the enforceable drinking water standard of 5.0 ug/l (parts per billion) to reduce the risk of cancer or other adverse health effects which may have been observed in laboratory animals. Drinking water that meets this standard is associated with little to any of this risk and should be considered safe.

CRYPTOSPORIDIUM- (Health Effects)
Cryptosporidium {krip'. to.spor.id.e.um} is a microscopic organism found in rivers and streams that can cause diarrhea, fever and gastrointestinal symptoms if ingested. It finds its way into the watershed through animal wastes. A treatment process that includes filtration, sedimentation, and disinfection effectively eliminates Cryptosporidium.

TOTAL COLIFORM (Health Effects)
We sample five locations per month for total coliform. EPA requires us to report positive samples. We are pleased to report that there were no positive results in this period. If there were coliforms present, they are generally not harmful themselves. The presence of these bacteria in drinking water, however, is generally a result of a problem with the water treatment or the pipes which distribute the water, and indicates that the water may be contaminated with organisms that cause disease. Disease symptoms may include diarrhea, cramps, nausea, and possible jaundice and any associated headaches and fatigue. These symptoms, however, are not just associated with disease causing organisms in the drinking water, but also may be caused by a number of factors other than drinking water.

5. Compliance with other Drinking Water Regulations:

No Exceedances were recorded for the Year 2002. We did however receive a Notice of Violation (NOV) from the New Jersey Department of Environmental Protection (NJDEP) concerning Nitrate/Nitrite sampling for the calendar year of 2002. It is an NJDEP requirement to sample for Nitrate/Nitrites once per year. The Nitrate/Nitrite sample that was to be conducted in 2002 was unfortunately overlooked, thus causing the NJDEP to issue this NOV on 3/14/03. A sample was immediately collected and analyzed as soon as the oversight was realized. The results of that sample came back as Non Detect (ND), thus meaning that there were no traceable amounts of Nitrate/Nitrites found in the water supply (see table below). Dating back to 1996 we have never had any results with detectable amounts of Nitrate/Nitrites. The Nitrate/Nitrite sampling for 2003 will be conducted again in the fall.

	Nitrate results	Maximum Contaminant Level (MCL)	Number of samples required to be taken
2003	Non Detectable	10 ppm	1
2002	**No sample taken**	**10 ppm**	**1**
2001	Non Detectable	10 ppm	1
2000	Non Detectable	10 ppm	1
1999	Non Detectable	10 ppm	1
1998	Non Detectable	10 ppm	1
1997	Non Detectable	10 ppm	1
1996	Non Detectable	10 ppm	1
1995	Non Detectable	10 ppm	

We have violated a drinking water standard. Even though this was not an emergency, as our customers, you have the right to know what happened and what we are doing to correct this situation.

We are required to monitor your drinking water for specific contaminates on a regular basis. Results of regular monitoring are an indicator of weather or not our drinking water meets health standards. During 2002 we did not monitor (sample) for Nitrite/Nitrate and therefore we cannot prove that the levels were below drinking water standard limits. We are to sample for Nitrates once per year. The sample for the year of 2002 was somehow overlooked during the sampling process that year.

NITRATE

Nitrate in drinking water at levels above 10mg/l is a health risk for infants of less than six months of age. High nitrate levels in drinking water can cause blue baby syndrome. Nitrate levels may rise quickly for short periods of time due to rainfall or agricultural activity. If you are caring for an infant, you should ask for advice from your local health care provider.

WHAT THIS MEANS

In order to ensure that tap water is safe to drink, the EPA prescribes regulations that limit the amount of certain contaminates in water provided by public water systems. At Picatinny our EPA Nitrate/Nitrite level requirement is 10mg/l or less. In the year 2001 our Nitrite levels were ND mg/l, which means that no Nitrate was detected in the water. A sample that was collected immediately after finding out about the missed sampling came back at Non Detect (ND), meaning there was no trace of Nitrate/Nitrites found in the Picatinny water Supply. Based upon our resampling there is nothing you need to do at this time

STEPS WE ARE TAKING TO PREVENT REOCCURENCE

We will also be taking another sample for Nitrates later in the year to cover the sampling requirement for 2003. We have also implemented a system of double checks on the sampling schedule in which we will be training additional personnel the sampling techniques and schedule, and also by inputting the schedule into our computerized maintenance system.

WAIVERS - The Safe Drinking Water Act regulations allow monitoring waivers to reduce or eliminate the monitoring requirements for asbestos, volatile organic chemicals and synthetic organic chemicals. Our system received monitoring waivers for the following:

Asbestos Waiver - The State determined that our system is not considered to be vulnerable to asbestos contamination. Our water was found to not be corrosive and our wells are not located in an area known to have asbestos-bearing rock formations. The NJDEP issued a waiver to Picatinny Arsenal in 1994.

Pesticides and Synthetic Organic Compounds (SOC's) - The State determined that our system is not considered to be vulnerable based on an extensive survey of the Arsenal land use. The NJDEP issued a waiver to Picatinny Arsenal in 1995.

6. IMPORTANT EDUCATIONAL INFORMATION:

Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites, which can cause symptoms such as nausea,

cramps, diarrhea, and associated headaches. Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons, such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune systems disorders, some elderly, and infants, can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline at 1-800-426-4791.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline at 800-426-4791.

SPECIAL CONSIDERATION REGARDING CHILDREN, PREGNANT WOMEN, NURSING MOTHERS AND OTHERS

Children may receive a slightly higher amount of a contaminant present in the water than do adults, on a body weight basis, because they may drink a greater amount of water per pound of body weight than do adults. For this reason, reproductive or developmental effects occur at lower levels than other health effects of concern. If there is insufficient toxicity information for a chemical (for example, lack of data on reproductive or developmental effects), an extra uncertainty factor may be incorporated into the calculation of the drinking water standard, thus making the standard more stringent, to account for the additional uncertainties regarding these effects. In cases of lead and nitrate, effects on infants and children are the health endpoints upon which the standards are based.

Nitrate in drinking water at levels above 10 mg/l is a health risk for infants of less than six months of age. High nitrate levels in drinking water can cause blue baby syndrome. Nitrate levels may rise quickly for short periods of time due to rainfall or agricultural activity. If you are caring for an infant, you should ask for advice from your local health care provider. Picatinny Arsenal Water treatment facility tests for nitrate and is pleased to inform you that we do not have any problems with nitrate levels. We are less than 0.50 mg/l (parts per million) in our results.

In order to ensure that tap water is safe to drink, EPA prescribes regulations that limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration regulations establish limits for contaminants in bottled water, which

must provide the same protection for public health. For more information on contaminants, please review the material enclosed in this report on page 3.

1,2, Dichloroethane - Some people who drink water containing this in excess of the MCL over many years may have an increased risk of getting cancer.

Copper - is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water-containing copper over the action level over many years could suffer liver or kidney damage. People with Wilson's Disease should consult their personal doctor.

Lead - Infants and young children are typically more vulnerable to lead in drinking water than the general population. It is possible that lead levels at your home may be higher than at other homes in the community as a result of materials used in your house plumbing. If you are concerned about elevated lead levels in your home water, you may wish to have your water tested and generally run your tap for thirty seconds to two minutes before using the water. Additional information is available from the Safe Drinking Water Hotline (1-800-426-4791).

Radon - is a radioactive gas that you can't see, taste, or smell. It is found throughout the United States. Radon can move up through the ground and into a home through cracks and holes in the foundation. Radon can build up to high levels in all types of homes and buildings. Radon can also get into indoor air when released from the tap water from showering, washing dishes, and other household activities. Compared to radon entering homes and buildings through soil, radon entering the home through tap water will in most cases be a small source of radon in indoor air. Radon is a known human carcinogen. Breathing air-containing radon can lead to lung cancer. Drinking water containing radon may also cause increased risk of stomach cancer.

Although the EPA has not yet set an acceptable level for radon in the water, the agency is considering a maximum level in the range of 300 pCi/L for **MUNICIPAL** water supplies. The EPA is also considering a maximum level of 1000 pCi/L for well supplies. However, some health physicists regard 5000 - 10,000 pCi/l a reasonable level for private well supplies. The main issue raised by commentors was that the occurrence and levels of radon in well water are higher than those projected by EPA. If you are concerned about radon in your home, test the air in your home. Testing is inexpensive and easy, and simple solutions are available. For additional information, call your state radon program or call EPA's Radon Hotline at (800-SOS-RADON).

ATTACHMENT T

NOT USED

ATTACHMENT U

NOT USED

ATTACHMENT V

Picatinny Arsenal Installation Restoration Program

Picatinny is an Official Hawk Watch Site

PICATINNY ARSENAL
TASK ORDER 17
PHASE II REMEDIAL INVESTIGATION REPORT, ROUNDS 1 AND 2, VOLUME 2 - AREA H SITES

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NOVEMBER, 2003

U.S. Army Corps of Engineers
Baltimore District

DRAFT

Total Environmental Restoration Contract (TERC) Number DACA31-95-D-0083

EXECUTIVE SUMMARY

Area H is located in the western side of PTA, southwest of Picatinny Lake along the base of Green Pond Mountain. Commonly referred to as the Munitions Assembly Area, or the 200 Building Area, Area H has had over 70 buildings, of which 17 were identified as part of the RI Concept Plan (ANL, 1991). In general, pilot-scale munitions production has taken place in Area H; however, armaments were produced here during World Wars I and II, the Korean War, and the Vietnam War. Specific operations performed in Area H include explosive melt-casting, pressing, pelleting, loading, machining, stenciling, and unit assembly and disassembly.

Area H is situated in a small valley bounded on the west by Green Pond Mountain and to the east-southeast by a slightly elevated hill. Bear Swamp Brook and its associated floodplain transect the center of the valley. The highest surface elevations found within Area H are along the slopes of Green Pond Mountain at approximately 750 ft msl. Surface topography slopes from Green Pond Mountain and the elevated hill towards Bear Swamp Brook. The central valley containing Bear Swamp Brook slopes to the southwest.

An unconsolidated aquifer and a bedrock aquifer were encountered in Area H. A total of 21 monitoring wells were installed in the unconsolidated aquifer and five monitoring wells were installed in the bedrock formations in Area H (two wells in the Leithsville Dolomite and three wells in the Precambrian Gneiss). The unconsolidated aquifer was present throughout Area H, except in the northeastern portion where bedrock outcrops at Site 151. Generally, the unconsolidated aquifer exhibited unconfined properties except in those areas where it was overlain by post-glacial alluvium, which causes semi-confined conditions due to smaller grain sizes. These conditions were evidenced by the artesian properties displayed in wells installed at Sites 55 and 130, near Bear Swamp Brook. A generalized scheme of groundwater flow for Area H indicates that groundwater from the unconsolidated aquifer flows downward into the bedrock units at elevated locations, such as ridges and hills, where fractures occur. Groundwater follows surface and bedrock topography and flows to lower elevations in the area to the southwest and near Bear Swamp Brook. Groundwater in the unconsolidated aquifer most likely discharges to Bear Swamp Brook, although this relationship has not been quantified.

Twelve sites were identified in Area H in the RI Concept Plan (ANL, 1991). Although Bear Swamp Brook was not identified as an RI site by the RI Concept Plan, the brook is the ultimate discharge point for overland drainage and/or runoff as well as wastewater discharges. For the purpose of this investigation, the portion of Bear Swamp Brook within Area H, which includes Bear Swamp, is being evaluated as an independent unit and referred to by the DSERTS/PICA Site number 193.

Then initial round of the Phase II RI sampling was performed at the Area H sites from June 1995 through November 1996. Results of this investigation were documented in the *Phase II Remedial Investigation Report, Round 1* (ICF KE, 1999b). Based on regulatory comments on the Phase II RI report, it was deemed that additional sampling was required to complete the characterization of the nature and extent of contamination at several Area H sites. Thus, a second round if sampling was performed at 10 of the 13 sites (including Bear Swamp Brook). The results of the Round 1 and Round 2 investigations are summarized in **Table ES-1** and **Section 10.0**.

Cumulative risks to site workers exceeded USEPA's target cancer risk level of 1E-4 at three sites (Sites 55, 100 and 131), and hazards exceeded the target noncancer hazard level of 1 at Sites 55 and 131. Feasibility studies are recommended to remediate the soil contamination at these sites. Institutional controls and engineering controls are recommended for the remaining sites including maintenance of existing engineering controls such as asphalt pavement or vegetative cover. Institutional controls such as incorporation of Area H into a Classification Exception Area (CEA) are recommended for area-wide groundwater. The trichloroethene contamination identified in the groundwater within the southern portion of Area H is being further investigated as part of the Mid-Valley Groundwater RI. Recommendations for this Area Of Concern (AOC) will be presented in the RI report for the Mid-Valley regional investigation.

Table ES-1
Phase II Area H RI Summary Table
Picatinny Arsenal, New Jersey

Site, Building, and Description	Summary of Field Activities and Samples Collected during the Phase II RI	LOC Exceedances	Risk Assessment Results	
55, Buildings 221, 223 and 225 - Explosives Inspection and Machining Facility	Radiological survey, 3 monitoring wells (install, develop, survey & aquifer testing), 6 groundwater samples (monitoring wells), 2 Geoprobe groundwater samples 36 surface soil samples, 13 subsurface soil samples, 19 subsurface soil samples (soil borings)	**Groundwater Samples:** 3 exceedances for RDX 1 exceedance for 2,4,6-TNT **Surface Soil Samples:** 5 exceedances for PCBs 2 exceedances for arsenic 1 exceedance for benzo(a)pyrene 1 exceedance for zinc **Subsurface Soil Samples:** No exceedances	**HHRA** Risk above target level of 1E-04 (risk drivers = PAHs, PCBs, arsenic) and hazard above target threshold of 1 (hazard driver = arsenic) for site research worker. Risk and hazard for excavation worker below target levels. **ERA** Site not evaluated in ERA due to limited habitat.	**AOC 1:** Surface soil conveyance system. **AOC 2:** Potential sub the Building 225 tank
62, Building 210 - Hazardous Waste Storage Facility	Radiological survey, 2 monitoring wells (install, develop, survey & aquifer testing), 2 groundwater samples, 8 surface soil samples, 1 subsurface soil sample, 11 subsurface soil samples (soil borings), 1 surface water sample, 2 sediment samples	**Groundwater Samples:** No exceedances **Surface Soil Samples:** 1 exceedance for benzo(a)pyrene, beryllium and copper **Subsurface Soil Samples:** No exceedances **Surface Water Sample:** 1 exceedance for 12 metals and 2 anions **Sediment Samples:** 2 exceedances for mercury 1 exceedance for copper	**HHRA** Risks within 1E-4 to 1E-6 for site research worker (risk drivers = benzo(a)pyrene and arsenic). Risk below target range for excavation worker. HI < 1 for both workers. **ERA** Site not evaluated in ERA due to limited habitat. Surface water and sediment samples evaluated as part of BSB.	**AOC 1:** Potential cor at Building 210.
64, Building 241 - Explosives Press Loading and Disassembly Facility	2 monitoring wells (install, develop, survey, & aquifer testing), 4 groundwater samples (monitoring wells), 2 hydropunch groundwater samples, 16 surface soil samples, 11 subsurface soil samples, 18 subsurface soil samples (soil borings), 3 surface water samples, 3 sediment samples	**Groundwater Samples:** 5 exceedances for TCE 1 exceedance for aluminum, iron & manganese **Surface Soil Samples:** 4 exceedances for beryllium 3 exceedances for arsenic 1 exceedance for PAHs **Subsurface Soil Samples:** No exceedances **Surface Water Samples:** 3 exceedances for 6 metals and ammonia 2 exceedances for bis(2-ethylhexyl)phthalate and sulfide 1 exceedance for cadmium and manganese **Sediment Samples:** 3 exceedances for PAHs and 3 metals 1 exceedance for fluoranthene and zinc	**HHRA** Risks within 1E-04 to 1E-06 for site research worker (risk drivers = PAHs and arsenic) Risks below the target level for excavation worker. HI < 1 for both workers. **ERA** Modeled risk and results of a soil bioassay indicate minimal risk to terrestrial species. Surface water and sediment samples evaluated as part of BSB.	**AOC 1:** SVOC conta 241. **AOC 2:** SVOC and
98, Former Building 268 - Explosives Loading and Assembly Facility	2 existing monitoring wells (survey & aquifer testing), 2 groundwater samples (existing wells), 10 surface soil samples, 6 subsurface soil samples, 2 sediment samples	**Groundwater Sample:** 2 exceedances for iron 1 exceedance for aluminum and manganese **Surface Soil Samples:** 3 exceedances for beryllium **Subsurface Soil Samples:** No exceedances **Sediment Samples:** 2 exceedances for lead 1 exceedance for PAHs and 3 metals	**HHRA** Risks within 1E-04 to 1E-06 for site research worker. HI < 1 for site worker. **ERA** Little potential risk to mammalian and avian species based on foodchain analyses.	**AOC 1:** PETN conta **AOC 2:** SVOC and

Table ES-1
Phase II Area H RI Summary Table
Picatinny Arsenal, New Jersey

Site, Building, and Description	Summary of Field Activities and Samples Collected during the Phase II RI	LOC Exceedances	Risk Assessment Results	
100, Former Building 278 - Explosives Loading Facility	Geophysical survey, 3 monitoring wells (install, develop, survey & aquifer testing), 3 groundwater samples, 18 surface soil samples, 3 subsurface soil sample, 15 subsurface soil samples (soil borings), 4 subsurface soil samples (test pits), 2 sediment samples	**Groundwater Sample:** 1 exceedance for RDX, iron and manganese **Surface Soil Samples:** 4 exceedances for PCBs 2 exceedances for PAHs **Subsurface Soil Samples:** 1 exceedance for benzo(a)pyrene **Sediment Samples:** 2 exceedances for PAHs and mercury 1 exceedance for chromium, copper and lead	**HHRA** Risk above 1E-4 for site research worker (risk drivers = PAHs, PCBs & arsenic) Risks below 1E-04 to 1E-06 for site research worker. HI < 1 for both workers. ERA Little potential risk to mammalian and avian species based on foodchain analyses. Mercury in sediment samples may pose elevated risk for benthic receptors.	**AOC 1:** PCB cont **AOC 2:** PAH cont
127, Building 230 - Explosives Melt Casting Facility	1 monitoring well (install, develop, survey & aquifer testing), 1 groundwater sample, 20 surface soil samples, 13 subsurface soil samples, 5 subsurface soil samples (soil borings)	**Groundwater Sample:** 1 exceedance for bis(2-ethylhexyl)phthalate **Surface Soil Samples:** 2 exceedances for arsenic **Subsurface Soil Samples:** No exceedances	**HHRA** Risks within 1E-4 to 1E-6 for site research worker (risk driver = arsenic). Risk below target range for excavation worker. HI < 1 for both workers. **ERA** Site not evaluated in ERA due to limited habitat.	**AOC 1:** Arsenic c
128, Buildings 235 and 236 - Explosives Production and Pressing Facility	Radiological survey, 4 monitoring wells (install, develop, survey & aquifer testing), 6 groundwater samples, 31 surface soil samples, 13 subsurface soil samples, 16 subsurface soil samples (soil borings)	**Groundwater Sample:** 3 exceedances for aluminum and manganese 1 exceedance for lead and radium-226 **Surface Soil Samples:** 7 exceedances for arsenic 1 exceedance for benzo(a)pyrene **Subsurface Soil Samples:** No exceedances	**HHRA** Risks within 1E-4 to 1E-6 for site research worker and excvation workers (risk drivers = benzo(a)pyrene and arsenic in surface soil; arsenic in subsurface soil). HI < 1 for both workers. **ERA** Mercury in sediment samples may pose elevated risk for benthic receptors.	**AOC 1:** Arsenic c
129, Building 240 - Administrative Facility	1 monitoring well (install, develop, survey & aquifer testing), 1 groundwater sample, 4 surface soil samples, 4 subsurface soil samples, 6 subsurface soil samples (soil borings)	**Groundwater Sample:** No exceedances **Surface Soil Samples:** No exceedances **Subsurface Soil Samples:** No exceedances	**HHRA** Risks within 1E-4 to 1E-6 for site research worker and excavation worker (risk driver = arsenic). HI < 1 for both workers. **ERA** Site not evaluated in ERA due to limited habitat.	No AOCs identifie
130, Building 252 - Explosives Pressing Facility	3 monitoring wells (install, develop, survey & aquifer testing), 4 groundwater samples, 7 surface soil samples, 19 subsurface soil samples (soil borings)	**Groundwater Sample:** 1 exceedance for methylene chloride, PCE, iron and manganese **Surface Soil Samples:** 1 exceedance for arsenic **Subsurface Soil Samples:** 1 exceedance for beryllium	**HHRA** Risk within 1E-4 to 1E-6 for site research worker (risk driver = arsenic). HI < 1 **ERA** Site not evaluated in ERA due to limited habitat.	No AOCs identifie

Table ES-1
Phase II Area H RI Summary Table
Picatinny Arsenal, New Jersey

Site, Building, and Description	Summary of Field Activities and Samples Collected during the Phase II RI	LOC Exceedances	Risk Assessment Results	
131, Building 266 - Wind Tunnel Laboratory	3 monitoring wells (install, develop, survey & aquifer testing), 6 groundwater samples (monitoring wells), 4 hydropunch groundwater samples, 24 surface soil samples, 6 subsurface soil samples, 10 subsurface soil samples (soil borings)	**Groundwater Sample:** 3 exceedances for TCE 1 exceedance for methylene chloride and aluminum **Surface Soil Samples:** 10 exceedances for arsenic 1 exceedance for benzo(a)pyrene **Subsurface Soil Samples:** 1 exceedance for arsenic	**HHRA** Risk above target level of 1E-04 (risk drivers = PAHs and arsenic) and hazard above target threshold of 1 (hazard driver = arsenic) for site research worker. Risk and hazard for excavation worker below target levels. **ERA** Modeled risk and results of a soil bioassay indicate minimal risk to terrestrial species.	**AOC 1:** Explosives **AOC 2:** SVOC cont northeast corner of **AOC 3:** Arsenic co
132, Former Buildings 271 and 271-A through 271-N - Explosives Pressing, Lead Azide Primer, Dry House and Ordnance Facility	2 monitoring wells (install, develop, survey & aquifer testing), 4 groundwater samples (monitoring wells), 4 hydropunch groundwater samples, 50 surface soil samples, 35 subsurface soil samples, 10 subsurface soil samples (soil borings), 1 sediment sample	**Groundwater Samples:** 7 exceedances for manganese 2 exceedances for RDX 1 exceedance for cadmium and lead **Surface Soil Samples:** 5 exceedances for arsenic 2 exceedances for beryllium and lead 1 exceedance for zinc **Subsurface Soil Samples:** 1 exceedance for arsenic **Sediment Sample:** No exceedances	**HHRA** Risks within 1E-4 to 1E-6 for site research worker and excavation worker (risk driver = arsenic in surface soil & subsurface soil). HI < 1 for both workers. **ERA** Little potential risk to mammalian and avian species based on foodchain analyses.	**AOC 1:** Explosives
151, Former Building 600 - Change House	2 monitoring wells (install, develop, survey & aquifer testing), 3 groundwater samples, 5 surface soil samples	**Groundwater Sample:** 2 exceedance for lead 1 exceedance for RDX **Surface Soil Samples:** No exceedances	**HHRA** Risk within 1E-4 to 1E-6 for site research worker (risk driver = arsenic). However , the maximum arsenic concentration detected at the site is below the LOC. HI < 1 **ERA** Site not evaluated in ERA due to limited habitat.	No AOCs have bee
PICA 193, Bear Swamp Brook	15 surface water samples, 39 sediment samples	**Surface Water Samples:** 8 exceedances for metals 5 exceedances for VOCs 3 exceedances for RDX and ammonia 2 exceedances for bis(2-ethylhexyl)phthalate and sulfide **Sediment Samples:** 31 exceedances for metals 25 exceedances for pesticides 13 exceedances for PCBs 10 exceedances for PAHs	**HHRA** No HHRA conducted because surface water, sediment and fish consumption are considered incomplete exposure pathways. **ERA** Moderate to high toxicity was observed in sediment samples from Bear Swamp and BSB. Results of the food-chain modeling suggest a potential for contaminant related impact to mink and great blue heron from arsenic and mercury.	**AOC 1:** Explosives Swamp Brook. **AOC 2:** Metals con sediment. **AOC 3:** PCB conta and Bear Swamp B **AOC 4:** Pesticides Swamp and Bear S
Area-Wide Groundwater	42 groundwater samples (monitoring wells), 12 Geoprobe/hydropunch groundwater samples	**Groundwater Samples:** 14 exceedances for manganese 8 exceedances for TCE 7 exceedances for RDX 6 exceedances for aluminum 5 exceedances for iron 4 exceedances for lead 2 exceedances for methylene chloride 1 exceedance for PCE, TNT, bis(2-ethylhexyl)phthalate, radium-226 & cadmium	HHRAs are performed on a site basis.	**GW AOC 1**: Explos groundwater at Site **GW AOC 2**: TCE c **GW AOC 3**: PCE c **GW AOC 4**: RDX a monitoring well 132

HHRA - Human Health Risk Assessment, ERA - Ecological Risk Assessment, IC - Institutional Controls, EC - Engineering Controls

10.0 AREA H STUDY SITES

10.1 INTRODUCTION

Area H is located in the western portion of PTA southwest of Picatinny Lake along the base of Green Pond Mountain (Figure 2-2 of Volume 1). The location of all Phase II sites in Area H is provided on **Figure 10-1**. This Area is located partially within the Robinson Enclosure, where ingress and egress are controlled by PTA security personnel. The enclosure fence dissects the area from northwest to southeast, and only Sites 64,129 and 131 are located outside of the enclosure fence.

Commonly referred to as the Munitions Assembly Area, or the 200 Building Area, Area H had over 70 buildings, of which 17 were identified as part of the RI Concept Plan (ANL, 1991). The area was originally developed in two phases: during the early 1900's for shell loading; and in the 1930's and 1940's as part of the melt and load line. In general, pilot-scale munitions production has taken place in Area H, however armaments were produced here during World War I, World War II, the Korean War, and the Vietnam War. Specific operations in Area H include explosive melt-castings, pressing, pelleting, loading, machining, stenciling, and unit assembly and disassembly.

Explosives, propellants, solvents, hydraulic oils, mercury, and photo-processing chemicals are known to have been used in Area H. Explosives used in Area H include Maximite (90% picric acid and 10% mono-nitro-naphthalene); explosive "A" (highly explosive ammonium picrate or dunnite), used until the early-1920's; lead azide, used between 1900 and 1920; and modern explosives including 1,3,5,7-tetranitro-1,3,5,7-tetrazacyclooctane (HMX), cyclonite (RDX), and Composition B (a mixture of RDX and trinitrotoluene (TNT). Propellants used in Area H include nitrocellulose, nitroguanidine, and nitroglycerine. Cobalt 60 and agent orange are reported to have been used and/or stored in Buildings 221 and 210, respectively. In general, all these materials were stored in small quantities. The only known underground storage tanks in Area H were wastewater collection tanks, which were formerly located at Buildings 225 and 252. These tanks were replaced with aboveground collection tanks housed in Buildings 221 and 225. Bulk materials are also known to have been stored here. Over the past twenty years, many of the buildings have been demolished under TECUP.

10.1.1 Topography and Surface Water Hydrology

Area H is situated in a small valley bounded on the west by Green Pond Mountain and to the east-southeast by a slightly elevated hill (see **Figure 10-1**). Bear Swamp Brook and its associated floodplain transect the center of the valley and flow from northeast to southwest. The highest surface elevations found within Area H are along the slopes of Green Pond Mountain at approximately 750 ft msl. The elevated hill, extending along the southeast side of the area reaches approximately 740 ft msl near Site 151. Southeast of this hill, adjacent to Area H, the topography slopes toward the main valley floor and Green Pond Brook. Elevations within Area H decrease to the southwest and the lowest elevations within Area H occur near the southern boundary, along Bear Swamp Brook. Surface elevations in these areas range from 696 to 707 ft msl. Surface topography slopes from Green Pond Mountain and the elevated hill towards Bear Swamp Brook and then down-valley.

Bear Swamp Brook serves as the main collection point for surface water drainage in the area. This water body originates as a spring along Green Pond Mountain within Area M. Bear Swamp Brook then flows down the mountain just to the southeast of Site 128 and travels from northeast to southwest, along the axis of the valley. The original stream channel has been disrupted by installation activities and the brook occasionally flows through a series of culverts and underground piping in this area. Surface water runoff in Area H flows down the elevated ridges via small intermittent streams, which eventually discharge to Bear Swamp Brook. Bear Swamp Brook exits Area H to the southwest and eventually discharges to Green Pond Brook approximately one mile to the south.

The slight topographic high associated with the elevated ridge, which trends from northeast to southwest along the southeast portion of the site, acts as a surface water divide within Area H. Surface water at Sites 98 and 178, along with portions of Sites 100, 132, 131, and 129 flows to the south-southwest and eventually discharges to Green Pond Brook south of Picatinny Lake.

Eight different types of soils have been identified in Area H. The central portion of Area H associated with Bear Swamp Brook is dominated by poorly drained Adrian Muck and Ridgebury Soil, as well as the

somewhat poorly drained Hibernia Stony Loam. Along the ridges oriented in a northeast-southwest direction on either side of Bear Swamp Brook lies well drained Rockaway and Urban Soils, as well as rock outcrops of the Rockaway Complex. The original surface topography has been altered by industrial activities such as the construction of buildings, drainage structures, re-channeling of Bear Swamp Brook, disposal operations, roadways, and former railroads.

10.1.2 Geology

A total of twenty-six monitoring wells and ten soil borings were installed in Area H to characterize the geology of the area. Twenty-one wells were installed in unconsolidated material while five wells were installed into bedrock units. The location of all monitoring wells installed in Area H, as well as the geologic cross-section layouts are presented in **Figure 10-2**. Four cross-sections were constructed for Area H: two trending northeast to southwest, parallel to the axis of the valley (**Figures 10-3 and 10-4**); and two trending from the northwest to the southeast, perpendicular to the axis of the valley (**Figures 10-5 and 10-6**).

The bedrock geology of Area H consists of four different formations; Green Pond Conglomerate, Leithsville Dolomite, Hardyston Quartzite, and Precambrian Gneiss. The Tanners Brook-Green Pond fault and an unnamed fault located to the west of the Green Pond Fault transect the area, as depicted on **Figure 10-7, Area H Generalized Bedrock Lithology**, which also depicts the extent of each formation within Area H. The Green Pond Conglomerate was identified during drilling activities in both the northern and western portions of Area H. Numerous outcrops of this formation have been observed along the slopes and ridges of Green Pond Mountain. This formation was found to slope with regional bedrock toward the southwest, ranging in elevation from 726 ft msl at Site 128 to 680 ft msl at Site 62 (**Figure 10-3**). The Leithsville Dolomite was encountered in the southern portion of Area H at Sites 131 and 132. This area is located along the Tanners Brook-Green Pond Fault on a slightly elevated ridge. The dip of the Leithsville Dolomite is currently unknown due to the limited number of borings installed in this area and the susceptibility of this formation to chemical weathering. The elevation of this unit ranged from approximately 680 ft msl at 130MW-1 to 697 ft msl at 131MW-3 (**Figure 10-4**). This apparent reversal in dip may be due to preferential chemical weathering. In addition, drill cuttings generated while advancing the borehole for well 131MW-2 contained blue gray to steel blue quartzite that is associated with Hardyston Quartizite Formation. Precambrian Gneiss was identified in the northeastern portion of the area at Sites 100 and 151 and appears to be present due to uplifted blocks associated with the Tanners Brook-Green Pond Fault (**Figure 10-5**).

The WES completed two seismic refraction surveys lines in Area H to derive qualitative information on the subsurface structure. The locations of these lines are depicted in **Figure 10-2** (USACE, 1994a). **Table 10-1** provides a comparison of the depths to competent rock determined by the WES survey to those depths to competent rock encountered during Phase II RI drilling program.

Table 10-1
Comparison of Seismic Data to Drilling Depths in Area H

WES Seismic Line Number	Depth to Competent Rock (WES)	Adjacent ICF KE Monitoring Well	Depth to Competent Rock (ICF KE)
H2	38	127MW-1	30
H3	15	128MW-1 128MW-4	25

All depths reported in ft bgs.

In line H2, WES reported a competent rock layer at 38 ft bgs. Monitoring well 127MW-1 was installed immediately north of this line during the Phase II RI and the Green Pond Conglomerate was encountered at approximately 30 ft bgs based upon drill cuttings and changes in drilling characteristics. The independent studies indicate a consolidated unit, possibly weathered conglomerate, is present between 30 to 40 ft bgs in the northwest portion of Area H.

In line H3, WES reported a consolidated unit at 15 ft bgs, but the depth to bedrock could not be determined. Data interpretation suggests that the consolidated unit is not bedrock. Monitoring wells 128MW-1 and 128MW-4 were installed immediately east of this line and the Green Pond Conglomerate was encountered at a depth of 25 ft bgs in each borehole. The difference in depth between these studies, 10 feet, may be due to the steep dip of the Green Pond Mountain structure, or the interpretative nature of seismic refraction data.

Along the axis of the valley, the bedrock surface generally slopes to the south-southwest following regional trends. Depth to bedrock from ground surface increases dramatically from the elevated ridges toward the long axis of the valley due to the steep dip of the bedrock and glacial scouring. Southeast of the elevated hill located on the southeast side of Area H, depth to bedrock increases toward the main valley as a result of down faulting associated with the Green Pond Fault (**Figure 10-5**).

Two unconsolidated geologic units were identified in Area H, recent alluvium and Quaternary-aged glacial till. The total thickness of the unconsolidated material in Area H ranged from 4 feet near the bedrock outcrop at well 151MW-1 to greater than 35 feet at 130MW-2, located in the center of the valley adjacent to Bear Swamp Brook.

The first unit is characterized by fine-grained deltaic sediments related to post-glacial alluvium associated with Bear Swamp Brook. This sequence contains fine to coarse sand with lenses of silt, clay, and occasional gravel stringers. The post-glacial alluvium is thin and of limited extent in the Phase II areas of PTA. Therefore, it has not been differentiated on the geologic cross-sections. The contact of this sequence with the underlying glacial sequence was gradational and identified through an increase in gravel content and a decrease in fines. The post-glacial sequence was thin to absent along the upland sites of Area H. Trending parallel to the axis of the valley, the unconsolidated sequence slopes from the base of Green Pond Mountain and thickens towards the southern boundary of Area H. Trending perpendicular to the axis of the valley (from the northwest to the southeast), the first unit is underlain by glacial till near Bear Swamp Brook and thickens from this point to the southeast, eventually pinching out on top of the elevated hill forming the southeastern boundary. Finally, a greater percentage of coarse material was identified at higher elevations and the post-glacial unit became progressively finer towards the center of the valley.

The second unconsolidated unit is classified as unstratified, unsorted glacial till deposited by subglacial drainage. This sequence consists of fine to coarse sand and gravel with trace fines and was identified throughout the area. The sequence was thickest in the western side of Area H, near Bear Swamp Brook. From the north to the south, the sequence thickened from the base of Green Pond Mountain toward the southwest, following Bear Swamp Brook (**Figure 10-3**). The unit was thickest adjacent to Site 62, where Bear Swamp Brook exits the area. Proceeding southeast of Bear Swamp Brook, the unit dramatically thins out as it approaches the elevated hill which trends along the southeastern portion of Area H (**Figure 10-4**). The sequence then reappears in the main valley, as depicted on **Figure 10-5.**

10.1.3 Hydrogeology

An unconsolidated aquifer and a bedrock aquifer were encountered in Area H. A total of 21 monitoring wells were installed in the unconsolidated aquifer and five monitoring wells were installed in the bedrock formations in Area H. Well construction data for these monitoring wells is presented in **Table 10-2**. Hydrogeologic parameters for the two aquifers are provided in **Table 10-3**. Hydrogeologic data for the unconsolidated aquifer has been differentiated by unconfined and semi-confined conditions in **Table 10-3**. Boring logs and well completion diagrams for the 26 wells are presented in **Appendices H1 and H2**, respectively. Well development records for the wells are provided in **Appendix H3**. All hydrogeologic calculations for Area H are presented in **Appendix H4**.

The unconsolidated aquifer was present throughout Area H, except in the northeastern portion where bedrock outcrops at Site 151. The aquifer ranged in thickness from approximately 5 feet at well 100MW-2 in the northeast, to over 35 feet at Site 130 in the center of the area adjacent to Bear Swamp Brook. The thickness of the unconsolidated aquifer varied across the area, thickening in both the center of the valley as well as southwestward.

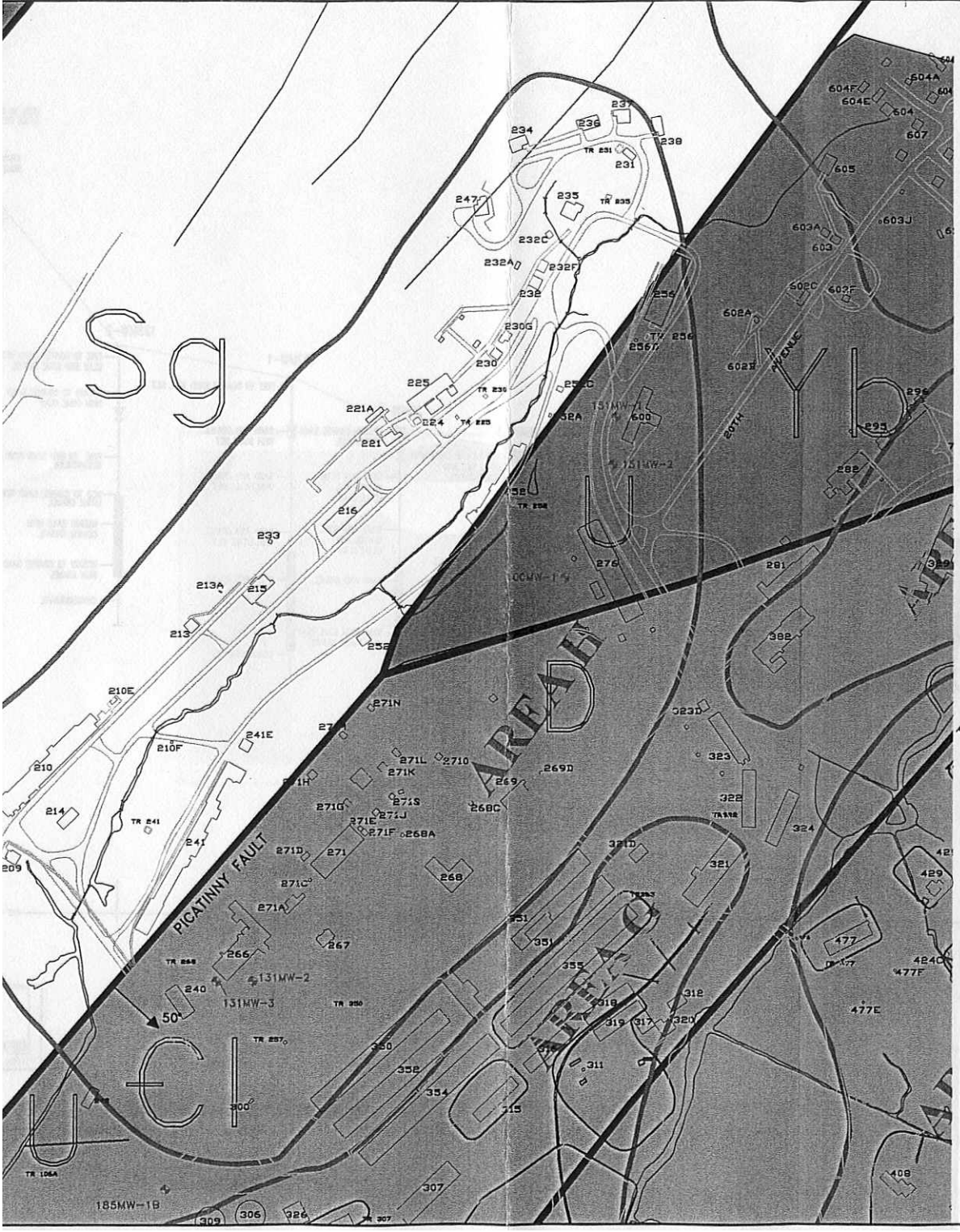
Groundwater elevations associated with wells installed in the unconsolidated aquifer indicate that groundwater in the unconsolidated aquifer generally flows towards Bear Swamp Brook from the northwest and generally downvalley to the southwest along Bear Swamp Brook. A groundwater divide is located along a

topographic high that trends along the southeast side of Area H. This divide separates groundwater flow from the general downvalley trend to a path to the southeast into the main valley of the installation. A potentiometric surface map of the unconsolidated aquifer is provided on **Figure 10-8**. Based upon aquifer (i.e., slug) testing, the average hydraulic conductivity was calculated to be 28.1 feet/day and ranged from 0.2 feet/day at 64MW-1 to 161.3 feet/day at 131MW-1. The wide range in values for hydraulic conductivity is typical for glacial environments (Driscoll, 1986). Average transmissivity was calculated at 626.2 feet/day based on an average aquifer thickness of 22 ft. The horizontal gradient was calculated at 0.0164 feet/feet based on representative wells chosen throughout the area, and the groundwater velocity was calculated to be 0.461 feet/ day based upon these average values.

Generally, the unconsolidated aquifer exhibited unconfined properties except in those areas where it was overlain by post-glacial alluvium, which causes semi-confined conditions due to smaller grain sizes. These conditions were evidenced by the artesian properties displayed in wells installed at Sites 55 and 130, near Bear Swamp Brook. Depths to groundwater in the unconsolidated aquifer ranged from 1.56 feet above ground surface at well 130MW-2 to 14.5 feet below ground surface at well 132MW-1.

A total of five monitoring wells were installed at Area H in underlying bedrock formations. Two wells were installed in the Leithsville Dolomite, and three wells were installed in the Precambrian Gneiss (see **Figure 10-7**). Based on the limited hydrogeologic data, the average hydraulic conductivity derived from aquifer testing data was calculated at 70.0 feet/day for the Leithsville Dolomite, and 0.7 feet/day for the Precambrian Gneiss. Depths to groundwater from ground surface for the Leithsville Dolomite were 9.21 feet at 131MW-2 and 11.32 feet at 131MW-3. Depth to groundwater from ground surface for the Precambrian Gneiss ranged from 7.93 feet to 24.59 feet.

A generalized scheme of groundwater flow for Area H indicates that groundwater from the unconsolidated aquifer flows downward into the bedrock units at elevated locations, such as ridges and hills, where fractures occur. Groundwater follows surface and bedrock topography and flows to lower elevations in the area to the southwest and near Bear Swamp Brook. Groundwater in the unconsolidated aquifer most likely discharges to Bear Swamp Brook, although this relationship has not been quantified. High horizontal hydraulic gradients are associated with the ridges with the steepest gradients in the northwest portion of the area. Lower horizontal hydraulic gradients occur near Bear Swamp Brook and within the southwestern portions of the area.



DE

Green Pond Conglomerat

Sg (Middle and Lower Silurian
conglomerate, quartzitic ar
siltstone. Grades downward
medium to coarse-grained
containing clasts of red sh
and chert; dark-gray shale
cobbles as much as 4 in.

Leithsville Formation

Cl (Middle and Lower Cambric
to medium grained, thin to
medium-gray, grayish-yell
and shale to medium-gray
sand grains as stringers o
Hardyston Quartzite. Unit r

Biotite-quartz-feldspar g

Yb (Middle Proterozoic)-Pale p
weathering, pinkish-gray, t
moderately layered and fol
quartz, biotite, garnet, and
that weathers rusty. The ru
layerd metaquartzite contai
also with layers of green,

FAULTS

FOLDS

REFERENCE:

GEOLOGICAL MAP BASED ON:
BEDROCK GEOLOGIC MAP OF THE DOVER QUADR
MORRIS COUNTY, NEW JERSEY BY RICHARD A.
2002, IN REVIEW.
NEW JERSEY GEOLOGICAL SURVEY OPEN FILE.

SCALE

0 250

10.2 SITE 55-BUILDINGS 221, 223, AND 225, EXPLOSIVES INSPECTION AND MACHINING FACILITY

10.2.1 Site History: Site 55

Building 221 (**Figure 10-9**) was constructed in the mid- to late-1940s. The only known renovation activities are reported to have occurred in the late 1960s and 1988 as part of an initiative to change PTA from a production facility to a research and development facility. Pilot-scale explosive unit machining and pack out operations occurred at Building 221 until the early- to mid-1970s.

Other activities conducted at Building 221 include explosive unit testing (impact, dimensional tolerance, friction, and electrostatic), inspection, and storage (out-of-date equipment and operations-related materials such as uranium-235 and methylene chloride). Munitions inspection activities involve the use of an ionizing source and/or radiographic equipment to develop an x-ray photograph of the interior of the munitions. Both explosives and munitions were inspected at Building 221. The radiographic equipment used here is known to have contained a cobalt-60 source, which is a high-energy gamma emitter.

The building is currently used for material storage. PTA personnel reported that materials used at Building 221 are limited to explosives, radioactive materials (Cobalt-60 and DU), and small amounts of solvents (primarily acetone) and propellants. PTA personnel estimated that Building 221 would generate less than 25 lbs/yr of propellant and/or explosive wastes and less than 750 gallons/yr of explosives contaminated wastewater operating under full capacity and optimum conditions. All material, except contaminated wastewater, was sent to the PTA Burning Ground for disposal.

During operational periods, contaminated wastewater (e.g., wastewater from steam traps, wastewater from wash down activities, and wastewater from vacuum pumps, and condensate lines) was filtered and discharged to a holding tank at Building 225 via an in-line trough conveyance system. According to PTA personnel, the filtrate was collected as a scrap waste and sent to the PTA Burning Ground for disposal. This trough originates at a 100-gallon collection tank located in a shed on the northeast side of Building 221. Non-contact wastewater was discharged directly onto the ground.

Former Building 223 is believed to have been located between Buildings 221 and 225. Because of the building's proximity to Buildings 221 and 225, it is believed that operations would have been similar. Furthermore, when Building 223 was operational, it is believed that wastewater discharges would have been conveyed via a wooden trough system to Building 225.

Building 225 was constructed in the 1940s and contains eight work bays. Currently, the building is used for machining and light assembly of prototype explosives and propellant units. Specific operations include solid explosives or propellant cutting, drilling, and pressing (casting).

Wastewater generated from explosives and propellant operations at Building 225 is collected by floor troughs and conveyed through plastic pipes to a 4,000-gallon collection tank. The collection tank also received explosives contaminated wastewater from Buildings 221, 230, 231, 232, and former Building 223 via a wooden trough conveyance system. The tank was installed in 1955 and is located in the basement of Building 225 in a reinforced concrete room, which provides some secondary containment. The tank was upgraded in 1992 to include a high-level alarm. Wastewater conveyed to the Building 225 collection tank was discharged through an 84 gallon concrete tank located adjacent to the Building 225 loading dock and onto a trough that ran downhill toward Bear Swamp Brook. The trough emptied to a stainless steel tank with baffles and a filter basket that overflowed to a sawdust filter box and finally discharged to Bear Swamp Brook. Information was inconclusive regarding when explosives contaminated wastewater was discharged to Bear Swamp Brook; however, the wastewater may have been managed in this way until 1983. Wastewater collected in the Building 225 tank is currently stored for up to 90 days and then shipped to Building 809 for treatment. The wooden filter box is still present at the bank of Bear Swamp (see photograph with site Figures), but the underground discharge line was recently removed to replace a water line, which ran below the discharge line.

PTA personnel reported incidents of tank overflow or leaks, although no records were available. One incident involved the discharge of approximately 25 gallons of propellant-contaminated wastewater. Reportedly, most wastewater was contained within the trough conveyance system. Similarly, unrecorded overflows of the original trough conveyance system were recalled, which prompted intrusive investigations and

eventual replacement of the system with flexible piping. Because this information is anecdotal, specific reports and documentation could not be located.

Waste materials which have been generated at Building 225 were limited to waste explosives and propellants (15B50 pounds per month), contaminated wastewater (1,250 gallons per month), and small quantities of solvents (primarily acetone). Waste materials other than wastewater were sent to the PTA Burning Ground for disposal.

Three 75-KVA pad-mounted transformers (TR-225) were located on the east side of Building 225. According to the PTA transformer database, one of the transformers had an Aroclor 1260 concentration of 85 mg/kg, while the other two transformers were not PCB-contaminated. The database also indicated that all three transformers were in fair condition. These transformers were removed in the 1990s as part of a facility-wide transformer removal action.

10.2.2 Previous Studies: Site 55

10.2.2.1 Previous Studies: Site 55, Building 221

ARDEC Discharge Investigation Project Report, 1991. The investigation indicated that wastewater (e.g., floor wash down, sink drains, and spills) from Building 221 discharges via an in-line trough conveyance system to Building 225. Non-contact wastewater discharges to the ground. Additional information regarding the discharge investigation is provided in Appendix A of the *Work Plan* (ICF KE, 1994b).

A June 1990 health survey indicated that maximum beta levels inside Building 221 were below detection limits. Other results obtained as part of the survey indicate the highest reading to be 3 milliroentgen per hour at the open port, and 1 milliroentgen per hour around the port after shielding was placed in the opening. The survey was conducted in preparation for and in conjunction with the removal of a radiographic cobalt 60 source used in Building 221. No corrective actions were required as a result of the survey.

10.2.2.2 Previous Studies: Site 55, Building 223

No building-specific studies have been conducted at Building 223.

10.2.2.3 Previous Studies: Site 55, Building 225

ARDEC Discharge Investigation Project Report, 1991. The investigation indicated that wastewater (deluge, process, and wash down) from Building 225 was discharged via an in-line trough system to a holding tank. The wastewater was then trucked to Building 809 for treatment (see Building 809 for wastewater management issues). All tank overflow, steam condensate, and coolant were discharged directly to the ground. Water from the building area surface water drainage system was discharged to the nearby swamp. Additional information regarding the investigation is provided in Appendix A of the *Work Plan* (ICF KE, 1994b).

Picatinny Arsenal Remediation of Site Delivery Order No. 6 Closure Report Building 225-Tank and Basement Area, October 11, 1991. RCRA closure activities were performed at Building 225 from March 13 to March 28, 1991, and on August 7, 1991. Two of six soil samples collected in and around Building 225 as part of the closure contained elevated levels of VOCs. Nearly all of the VOCs identified were acetone. A complete list of the VOCs identified was not provided in the report. Acetone was also identified in the remaining samples. It was noted that acetone was used in the field as part of the decontamination procedures. Metals were also detected in the soil samples; however, NJDEPE had not established cleanup standards for these metals. According to correspondence from Thomas Sherman, NJDEPE, to Thomas Solecki, ARDEC, dated December 8, 1992, regarding the closure, the subject area will require further action under the 1991 Federal Facility Agreement between U.S. Army ARDEC and the USEPA under CERCLA Section 120. Pertinent information (e.g., sample location plan, analytical results, etc.) regarding the closure is provided in the Appendix A of the *Work Plan* (ICF KE, 1994b). The metals contamination identified during the RCRA closure activities was removed in 1992 during construction of a concrete spill containment pad for the truck loading area in front of Building 225 (see photograph with site Figures). Soil was excavated to a minimum of three feet and disposed of off site.

According to file documentation for Site 55, the 200 area, an internal investigation was undertaken by ARDEC in October and November 1987. Specifically, a total of 18 soil samples were collected from 9 locations near Building 225, along the wastewater conveyance trough, and near the trough discharge point to Bear Swamp Brook. The samples were collected from the ground surface and from approximately 1 foot

below the ground surface. The collected samples were analyzed for HMX, RDX, and TNT. In general, the reported analytical concentration of the explosives ranged from between 5.8% and 0.2% in surface soil and 0.3% and 0.01% in subsurface soil. According to PTA, no corrective actions were taken in response to this study because of proposed CERCLA investigation of this site.

PTA personnel reported that the facility completed testing in September 1993 of over 1,000 machines with hydraulic oil to identify those machines, which contain PCBs in the hydraulic oil. It was reported that none of the hydraulic oil, except that contained in a milling machine in Building 225, tested positive for PCBs. Pertinent analytical data for Building 225 are presented in Appendix A of the *Work Plan* (ICF KE, 1994b).

10.2.3 Summary of Phase II RI Sampling Program

The initial Phase II RI sampling activities (Round 1) at Site 55 were conducted between June 1995 and October 1996. The Phase II Round 1 RI sampling program for Site 55 included:

1. Conducting a radiological survey;
2. Collecting 32 surface soil samples from 16 locations;
3. Collecting 13 subsurface soil samples from eight surface soil locations;
4. Installing one soil boring and collecting five subsurface soil samples;
5. Installing three monitoring wells and collecting eleven subsurface soil samples; and,
6. Sampling, performing aquifer testing, and surveying the newly installed wells.

Follow-up investigations (Round 2) were conducted between November 2000 and June 2001 based on the results of the above sampling and regulatory comments, and included:

1. Collecting four surface soil samples;
2. Collecting three subsurface samples at three soil boring locations;
3. Collecting two Geoprobe groundwater samples; and
4. Re-sampling three existing monitoring wells.

Table 10-4 provides a list of all the samples that were collected at Site 55 and analyzed as part of the Phase II RI, as well as any deviations from the approved *Final Picatinny Arsenal Phase II RI/FS Final Sampling and Analysis Plan, Volume I, FSP*, (ICF KE, 1994a). In addition, **Table 10-4** presents the analyses performed on the samples. Off-site analytical results for the Round 1 samples are presented in **Tables 10-5 through 10-7**. Analytical results for the Round 2 samples are presented in **Tables 10-10 through 10-12**. Only compounds detected above the CRL are presented in these tables. Compounds detected above their associated LOC are indicated with bold and shading. Sample designations are explained in **Section 3.1** of Volume 1 of this RI Report.

During the Round 1 field investigation, on-site analysis was also performed on all surface soil and subsurface soil samples collected at Site 55. These samples were analyzed on-site for the following analytical parameters: VOCs, SVOCs, explosives, pesticides/PCBs, and TPH. Only compounds detected above the SQL for on-site analysis are presented in **Tables 10-8 and 10-9**. These tables also provide a listing of all samples that were analyzed on site. Detailed discussion of both the on-site and off-site analytical programs can be found in **Section 4** of Volume 1 of this report.

10.2.4 Preliminary Screening Survey Results

A 180-ft x 60-ft radiological survey grid was established in the area of former Building 221. None of the soil samples analyzed contained levels of radiation in excess of established regulatory limits or PTA-established background levels. Details on the radiological survey methodology and protocols are provided in **Section 3** of Volume 1 of this report. Specific information on the surveys (e.g., survey maps, analytical data) can be found in the *Picatinny Arsenal Scoping Survey Report* (SEG, 1996), which was included as Appendix A in the *Phase II RI Report, Round 1* (ICF KE, 1999b).

10.2.5 Summary of Chemical Analytical Results

The chemical analytical results of the Phase II RI are summarized in this section by sample media and subdivided into off-site and on-site results. **Figure 10-9** presents the Phase II sampling locations at Site 55. Analytical data tables are presented at the end of this section. Only those analytes detected in at least one sample are presented on the tables.

10.2.5.1 Groundwater

Analytical results of the groundwater samples collected from three monitoring wells at Site 55 are presented in **Table 10-5** for the Round 1 sampling and **Table 10-10** for the Round 2 investigations. The analytical results are discussed on an area-wide basis in the Groundwater Assessment section for Area H (**Section 10.15**).

Several groundwater samples could not be collected at Site 55, including the proposed installation of an upgradient monitoring well, due to access problems as a result of the covered walkway, a wastewater conveyance trough and the steep, rocky slope behind Building 255. These unsuccessful sample locations are shown on **Figure 10-9** in green.

10.2.5.2 Surface Soil

Off-site analytical results for the 32 surface soil samples collected at Site 55 during the Round 1 investigation are presented in **Table 10-6** while the on-site analytical results are presented in **Table 10-8**. Follow-up sampling results (Round 2) are provided in **Table 10-11**. Analytical results from these surface soil samples are summarized as follows:

VOCs were not detected at concentrations exceeding their LOCs in the off-site analysis. In two of the samples, one VOC was detected. Acetone and trichlorofluoromethane were detected at concentrations slightly above the CRLs in the off-site analytical samples.

Fourteen SVOCs were detected in at least one sample. Only one SVOC was detected at a concentration in excess of its LOC. Sample 55SS-4A had an LOC exceedance for benzo(a)pyrene. The benzo(a)pyrene concentration in this sample was 2.5 mg/kg (LOC = 0.66 mg/kg). All other SVOC concentrations were below their respective LOCs. It appears that the SVOC contamination is an isolated incidence. PCBs were identified in 19 of the 20 soil samples. Aroclor 1254 levels exceeded the LOC of 2.0 mg/kg at four locations with a maximum concentration of 19.0 mg/kg. Aroclor 1260 was detected at one location (55MW-2A) in excess of the LOC at a concentration of 5.9 mg/kg.

The following explosives were identified in the surface soil samples: HMX, nitroguanidine, nitrocellulose, and PETN. For HMX and nitroguanidine, the levels did not exceed their respective LOCs. Nitrocellulose and PETN, which do not have LOCs, had maximum concentrations of 97.5 mg/kg and 21.5 mg/kg, respectively.

Arsenic, mercury, and zinc were detected randomly at concentrations equal to or slightly above their LOCs. Concentrations of anions were either below LOCs or no LOC exists for the analyte. Samples 55SS-7, 55SS-9, and 55SS-11 all contained diesel fuel at concentrations ranging from 9.97 mg/kg to 30.4 mg/kg. All of these samples were collected on the southwest side of Building 225 near the drainage troughs. No LOC has been established for this compound.

On-site analysis of surface soil samples indicated low levels of the pesticides 4,4-DDE and 4,4-DDT and the explosives HMX and 1,3,5-trinitrobenzene at concentrations below their respective LOCs. The PCB, Aroclor 1254 was detected in concentrations exceeding its LOC of 2.0 mg/kg in four samples. All four PCB exceedances were identified in samples collected along the trough system. PCBs were not detected in the surface soil samples collected at the soil boring and monitoring well locations. Aroclor 1260, which was detected at 55MW-2A during the off-site analysis, was not identified during the on-site analysis. The following SVOCs were detected at concentrations above their LOCs in Sample 55SS-4A: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, and indeno(1,2,3-cd)pyrene. The off-site analysis indicated that these compounds were also detected in concentrations above their LOCs in Sample 55SS-4A.

10.2.5.3 Subsurface Soil

Off-site analytical results for the subsurface soil samples collected at Site 55 are presented in **Tables 10-7 and 10-12** while the on-site analytical results are presented in **Table 10-9**. No LOC exceedances were reported in the subsurface soil samples. Sample 55SS-4D, collected from the 2-4 ft bgs interval, contained benzo(a)pyrene, at a concentration above the LOC of 0.66 mg/kg during on-site analysis. Samples 55SS-5D and 55SS-7B, also collected from 2-4 ft bgs, contained Aroclor 1254 at concentrations of 2.4 mg/kg and 5.7

mg/kg, respectively (LOC = 2.0 mg/kg). Benzo(a)pyrene and Aroclor 1254 were not detected in the surface soil samples collected and analyzed on-site at these two locations.

10.2.6 Risk Assessment Results

Based on the human health risk assessment approach (**Section 8.0**), estimated cancer risks and noncancer hazards, were quantified for Site 55. Risk assessment details, including procedures used for the selection of site COPCs, chemical-specific factors and soil emission equations for COPCs, Site 55 risk tables, and risk assessment uncertainty analysis, are presented in **Appendix H7**.

Estimated cancer risks and noncancer hazards quantified for realistic exposure scenarios are summarized as follows for current/future industrial research workers and current/future construction excavation workers. For the current/future industrial research worker, routes of exposure evaluated included: incidental ingestion and dermal contact with soil, inhalation of dust particles, and volatilization of constituents in soil to ambient air followed by inhalation. For the current/future construction excavation worker, routes of exposure evaluated included: incidental ingestion and dermal contact with soil, inhalation of dust particles, volatilization of constituents in soil to ambient air followed by inhalation, and dermal contact with constituents in groundwater.

COPCs selected for Site 55 included five COPCs in surface soil, two COPCs in subsurface soil, and five COPCs in groundwater (**Table 10-13**). COPCs, by media, are listed below (see **Appendix H7** for details):

Table 10-13
Summary of Site 55 COPCs

COPCs by Media	Surface Soil	Subsurface Soil	Surface Water (No Data)	Sediment (No Data)	Ground-water
4-Amino-2,6-Dinitrotoluene					X
Ammonia					X
Aroclor-1254	X				
Aroclor-1260	X				
Arsenic	X	X			X
Benzo(a)pyrene	X				
Mercury	X	X			
RDX					X
2,4,6-Trinitrotoluene					X

These COPCs were generally selected based on risk-based concentrations (RBCs for target cancer risk of 1E-6 and target noncancer hazard of 0.1) and available ARARs (see **Section 8.0** and risk summary Table 2s in **Appendix H7**). A summary of estimated risks and hazards for the realistic exposure scenarios is as follows in **Table 10-14** (from **Appendix H7** risk summary Tables 9 and 10):

Table 10-14
Summary of Site 55 Estimated Risks and Hazards

Receptor (Current and Future)	Estimated Total Cancer Risk (RME unless noted)	Cancer Risk Driver(s) (contributing most to total risk)	Media Contributing Most to Cancer Risk
Industrial Research Worker	1.1E-4 (CT = 1.8E-5)	Aroclor 1254, arsenic, Aroclor 1260, benzo(a)pyrene	Surface Soil
Construction Excavation Worker	6.3E-7	NR - risks acceptable	NR - risks acceptable

Table 10-14 (Continued)
Summary of Site 55 Estimated Risks and Hazards

Receptor (Current and Future)	Estimated Total Noncancer Hazard (RME unless noted)	Noncancer Hazard Driver (contributing most to total hazard)	Media Contributing Most to Noncancer Hazard
Industrial Research Worker	5.1 (CT = 0.17)	Aroclor 1254	Surface Soil
Construction Excavation Worker	0.10	NR - hazards acceptable	NR - hazards acceptable

NR = not relevant. Cancer risk drivers and/or noncancer hazard drivers not presented because risks and/or hazards acceptable.

The estimated total cancer risk of 1.1E-4 for the industrial/research worker RME scenario is based upon the following risks associated with the three exposure pathways evaluated and totaled: 1.4E-5 for ingestion, 7.5E-9 for inhalation, and 9.5E-5 for dermal contact. The primary risk drivers are PCBs, benzo(a)pyrene and arsenic. If the CT approach is used, based on average EPCs for the COPCs, the estimated total cancer risk for the industrial/research worker drops from 1.1E-4 to 1.8E-5. The estimated total hazard for the industrial/research worker RME scenario is 5.1, which is above USEPA's target noncancer hazard threshold of 1. The primary hazard driver is PCB Aroclor 1254. If the CT approach is used, based on average EPCs for the COPCs, the estimated total noncancer hazard for the industrial/research worker drops from 5.1 to 0.17.

The estimated RME risk for the realistic exposure scenario for the construction excavation receptor is below USEPA's target cancer risk range of 1E-4 to 1E-6. In addition, the estimated total hazard for the construction excavation worker scenario is below USEPA's target noncancer hazard threshold of 1.

There is limited habitat at Site 55. Most samples were collected in mowed areas or close to the buildings in an area with large boulders. As a result, food chain effects are unlikely and no ERA was conducted for this site.

10.2.7 Areas of Concern

Based on the chemical levels detected in the soil at Site 55 during the Phase II RI and regulatory comments received on the RI Report (ICFKE, 1999b), the following Areas of Concern (AOC) were identified:

- AOC 1: Surface soil contamination along the trough conveyance system; and
- AOC 2: Potential subsurface contamination associated with the Building 225 tanks.

AOCs represent those areas within each site that may require additional investigation to complete the characterization of the extent of contamination associated with the AOC. The AOCs do not include every single exceedance of LOCs at a site. Factors considered during the determination of the AOCs included the following: number and magnitude of the exceedances related to the LOCs, whether the results could be attributable to natural background levels (e.g., metals and radiological parameters), mobility of the contaminants (e.g., low mobility of PCBs), toxicity based on existing toxicological data (e.g., low toxicity of NC and PETN), and evidence of site-related anthropogenic contamination (e.g., explosives). Following identification of the AOCs, contamination at each site was evaluated in a HHRA. Areas of concern and recommendations for groundwater are discussed on an area-wide basis in **Section 10.15, Groundwater Assessment**.

10.2.7.1 AOC 1: Surface Soil Contamination along the Trough Conveyance System

In October and November 1987, an internal investigation was conducted of Building 225 by ARDEC. A total of 18 soil samples were collected from nine locations along the wastewater conveyance trough and near the discharge point of the trough to BSB and analyzed for HMX, RDX and TNT. Analytical results indicated maximum concentrations of HMX (30,000 mg/kg), RDX (57,000 mg/kg), and TNT (53,000 mg/kg) in the surface soil and up to 2,500 mg/kg of HMX, 900 mg/kg of RDX, and 1,600 mg/kg of TNT in the subsurface soil. No corrective actions were taken in response to these results, because Building 255 was intended for

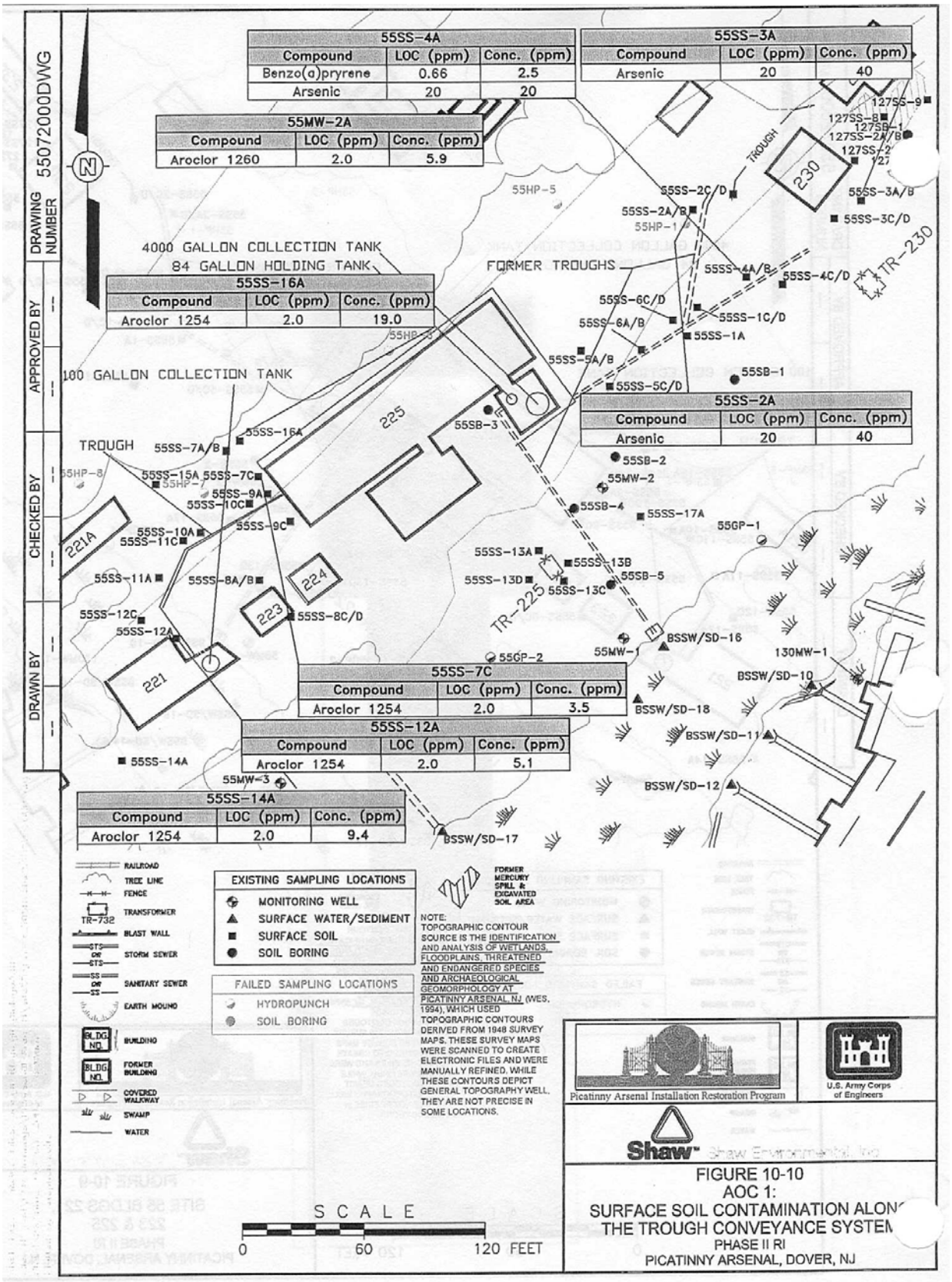


FIGURE 10-10
AOC 1:
SURFACE SOIL CONTAMINATION ALONG THE TROUGH CONVEYANCE SYSTEM
PHASE II RI
PICATINNY ARSENAL, DOVER, NJ

10.6 SITE 100-FORMER BUILDING 276, EXPLOSIVES LOADING FACILITY

10.6.1 Site History: Site 100-Building 276, Explosives Loading Facility

Building 276 (**Figure 10-16**) was constructed in 1902 and was used as a powder storage magazine from 1902 until 1922. The three-story Building 276 had a steel frame, concrete slab foundation, and seven operation bay areas. Renovations were made to Building 276 in 1911, 1919, 1924, 1926, and 1938 through 1940. The 1926 renovations were in support of a bomb monorail. The building was accessible by railroad. Around 1922 the building was converted to a shell-loading plant. Inert rockets, M-91 fuzes, and bombs (M-43 300 lb and M-31 100 lb) were loaded in the building at various times. JB-2 propellant powder was also used here for a short period of time around 1947. Building 276 was one of the major facilities used in the production of explosives during World Wars I and II. The building was decontaminated and demolished in accordance with TECUP in the late 1980s. The location of former Building 276 is used as a staging area for soil piles from sanitary sewer excavations and for metal plates used in ammunition testing. In 2003, a roof was erected over a portion of the concrete slab to protect the staged material from the weather. Additional materials staged in this area since the construction of the roof include wooden boards, aluminum pipes and generators (see photograph with site Figures).

The specific type and quantity of wastes generated from operations at Building 276 are not known, except for the use of JB-2 propellant powder. The fact that explosives-related operations took place here indicates that materials used and/or derivative wastes generated in appreciable quantities would likely include: scrap explosive wastes, solvent contaminated rags (primarily acetone), and explosives contaminated wastewater. Rags and wastewater were typically generated from cleaning equipment and from washdown activities, respectively. Wastestreams other than wastewater in Area H were generally red-canned and disposed of at the PTA Burning Ground.

Unauthorized dumping of waste material has occurred in and around the location of former Building 276. Materials dumped here included storage tanks, test chambers, and rocket components. In addition, explosives contaminated soil excavated from the area in and around the wastewater conveyance trough system at Building 225 is documented to have been temporarily stored here.

A pad-mounted transformer, TR-276, was located south of former Building 276. The transformer was identified during a site inspection and was not listed in the PTA transformer database. The transformer appeared to be in good condition, but was not labeled to indicate its fluid contents. The transformer was removed in the 1990s as part of a facility-wide transformer removal action..

10.6.2 Previous Studies: Site 100-Building 276, Explosives Loading Facility

Soil samples were collected in July 1986 as part of an internal investigation from around a transformer pad in the Building 276 area. A total of six samples was collected from 0 to 6 inches below the ground surface and analyzed for PCBs. The results showed elevated PCB levels between 14 and 105 ppm. According to PTA personnel, no corrective actions were taken. The analytical data are presented in Appendix A of the *Picatinny Arsenal Phase II Remedial Investigation/Feasibility Study Work Plan, Final* (ICF KE, 1994b).

10.6.3 Summary of Phase II RI Sampling Program

The initial Phase II RI sampling activities (Round 1) at Site 100 were conducted between May 1995 and November 1996. The Phase II (Round 1) RI sampling program for Site 100 included:

1. Conducting a geophysical survey;
2. Collecting twelve surface soil samples from eight locations;
3. Collecting two subsurfacee soil samples from one surface soil location;
4. Collecting two sediment samples;
5. Excavating two test pits and collecting four subsurface soil samples;
6. Installing three soil borings and collecting twelve subsurface soil samples;
7. Installing two monitoring wells and collecting three subsurface soil samples; and,
8. Sampling, performing aquifer testing, and surveying the newly installed monitoring wells.

Follow-up investigations (Round 2) were conducted between November and December 2000 based on the results of the above sampling, and included:

1. Collecting six surface soil samples;

2. Collecting one subsurface sample;
3. Installing one new monitoring well; and
4. Sampling and surveying the newly installed well.

Table 10-48 provides a list of all the samples that were collected at Site 100 and analyzed as part of the Phase II RI, as well as any deviations from the approved *Final Picatinny Arsenal Phase II RI/FS Final Sampling and Analysis Plan, Volume I, FSP* (ICF KE, 1994a). In addition, **Table 10-48** presents the analyses performed on the samples. Off-site analytical results for the Round 1 samples are presented in **Tables 10-49 through 10-52**. Analytical results for the Round 2 samples are provided in **Tables 10-58 and 10-59**. Only compounds detected above the CRL are presented in these tables. Compounds detected above their associated LOC are indicated with bold and shading. Sample designations are explained in **Section 3.1** of Volume 1 of this RI Report.

During the Round 1 field investigation, on-site analysis was also performed on all surface soil, subsurface soil and sediment samples. These samples were analyzed on-site for the following analytical parameters: VOCs, SVOCs, explosives, pesticides/PCBs, and TPH. Only compounds detected above the SQL for on-site analysis are presented in **Tables 10-53 through 10-57**. These tables also provide a listing of all samples that were analyzed on-site. Detailed discussion of both the on-site and off-site analytical programs can be found in **Section 4** of Volume 1 of this RI Report.

10.6.4 Preliminary Screening Survey Results

Site 100 is an area where miscellaneous waste materials have been dumped. Much of the paved portion of the property is used for metal storage and, therefore, could not be included in the survey. Since the waste materials likely had a large metallic component, EM61 methods were used. An EM61 survey was completed over the majority of the site. Information on the survey is presented in *Land Based Geophysical Investigations Conducted at Picatinny Arsenal, New Jersey* (Blackhawk, 1995a), which was included as Appendix C of the *Phase II RI Report, Round 1* (ICFKE, 1999b).

Three large anomalous zones were detected in the survey. The first anomalous zone was located in the northern area of the site, beyond the debris piles. The second and largest zone was located in the waste pile staging area. The third zone spreads outward in all directions from the asphalt-paved area. The third anomalous zone is believed to be caused by the stockpile of steel plates stored on the pavement.

Two test pits were attempted to investigate the large anomalous zone located near the waste pile staging area. Test pit 100TP-1 contained various pieces of metallic construction debris. Test pit 100TP-2 was completed to the south of the waste pile staging area and no man-made objects were discovered in test pit TP100-2. Additional information on the test pit investigations such as test pit logs can be found in *Draft Phase II Test Pit Result Summaries* (ICF KE, 1997a), which was included as Appendix F of the *Phase II RI Report, Round 1* (ICFKE, 1999b).

10.6.5 Summary of Chemical Analytical Results

The chemical analytical results of the Phase II RI have been summarized in this section by sample media and subdivided into off-site and on-site results. Analytical data tables for the off-site and on-site results are presented at the end of this section. Only those analytes detected in at least one sample are presented on the tables. **Figure 10-16** presents the Phase II sampling locations at Site 100.

10.6.5.1 Groundwater

The analytical results of groundwater samples collected from monitoring wells in Site 100 during the Round 1 field investigation are presented in **Table 10-49**. Since no compounds were dected above the SQL in the groundwater sample collected from 100MW-3 during Round 2, no data table is presented at the end of this section for the Round 2 sampling. A summary table listing all compounds analyzed for in 100MW-3 and their corresponding SQLs is provided in **Appendix H8**. The analytical results are discussed on an area-wide basis in the Groundwater Analytical Assessment section for Area H (**Section 10.15**).

10.6.5.2 Surface Soil

Eighteen surface soil samples were collected throughout Site 100 at surface soil, soil boring, monitoring well and test pit locations. Off-site analytical results for the Round 1 surface soils are provided in

Table 10-50, while on-site analytical results for the surface soils are presented in **Tables 10-53, 10-56 and 10-57**. The results of the Round 2 sampling are provided in **Table 10-58**. The analytical results of the surface soil samples are summarized below.

Trichlorofluoromethane was the only VOC identified in the off-site analysis. It was identified in one sample at a concentration slightly above the CRL and well below the LOC. PAHs were detected in two samples, 100SS-7A and 100SS-8A, at concentrations above LOCs. Benzo(a)pyrene, benzo(b)fluoranthene, and dibenz(a,h)anthracene were detected above LOCs in both samples. Benz(a)anthracene was reported in 100SS-7A in excess of the LOC. Both samples were collected approximately 20 feet downgradient of former transformer pad TR-276. PCBs were identified in seven samples. Aroclors 1248 and 1260 were reported in the samples. The total PCB concentrations in four samples exceeded the LOC of 2.0 mg/kg. The total PCB concentrations in these four samples ranged from 3.50 mg/kg at 100SS-5A to 12.4 mg/kg at 100SS-3A. These samples are located in the waste pile staging area. No other analytes were detected at levels above their respective LOCs. 2,4,6-Trinitrotoluene was detected in one sample at a concentration below the LOC. There were no LOC exceedances for metals. Diesel fuel was identified in Sample 100SS-2C at a concentration of 20.5 µg/g, which well below thje LOC of 10,000 mg/kg for TPHs.

On-site analysis of nine surface soil samples revealed low levels of the pesticide 4,4'-DDT in one sample and the explosives 1,3,5-trinitrobenzene (1,3,5-TNB); 2,4,6-TNT; and 2,6-DNT at concentrations below their respective LOCs. Amino DNTs were detected in three samples with a maximum concentration of 8.4 mg/kg, which is below the LOC of 120 mg/kg established for this compound. The following SVOCs were detected at elevated levels in two samples collected around the transformer pad: benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and benzo(k)fluoranthene. Sample 100SS-1 collected at the transformer pad was not analyzed for SVOC during off-site analysis. The levels of PAHs at the transformer pad are most likely associated with hydraulic fluid or pad maintenance. Samples collected downgradient of the pad during the Round 2 field investigation also contained elevated PAH levels.

10.6.5.3 Subsurface Soils

Subsurface soil samples were collected throughout Site 100 at soil boring, monitoring well and test pit locations. Off-site analytical results for the Round 1 subsurface soils are provided in **Table 10-51**, while on-site analytical results for these subsurface soils are presented in **Tables 10-54, 10-56 and 10-57**. The results for the Round 2 sampling are provided in **Table 10-59**. The analytical results are summarized below.

Low levels of 1,2-dichloroethene (total), methylene chloride and TCE were reported in sample 100MW-2B from the off-site analysis. All concentrations are below their LOC of 1 mg/kg. None of these VOCs were detected in the groundwater samples. Trichlorofluoromethane was detected in one sample at a concentration well below the LOC of 23,000 mg/kg. No other VOCs were detected in the soil samples. Benzo(a)pyrene was detected in sample 100SB-4B at a concentration of 0.98 mg/kg compared to the LOC of 0.66 mg/kg. No detectable levels of PCBs were identified. 2,4,6-Trinitrotoluene was detected in all three soil borings with a maximum concentration of 1.07 µg/g at the 20-22 ft depth interval in soil boring 100SB-1. Picric acid and 1,3,5-TNB were also detected at low levels in soil boring 100SB-3 at a depth interval of 15-17 ft. The 2,4,6-TNT and the 1,3,5-TNB concentrations did not exceed their respective LOCs. A LOC has not been established for picric acid. There were no LOC exceedances for metals. Diesel fuel was reported at a concentration of 18.8 mg/kg in sample 100SB-1B, Diesel fuel was not detected in samples analyzed from 0-2 ft bgs (100SB-1A) or 15-17 ft bgs (100SB-1D) at 100SB-1.

On-site analysis of 17 subsurface soil samples detected a low concentration of methylene chloride, a common laboratory contaminant, in one sample. The pesticides, beta-BHC and heptachlor, were detected in Sample 100SB-1B collected from 5-7 ft bgs near the former storm sewer catch basin. Concentrations of explosives and SVOCs were similar to the levels found in the off-site analysis. However, the explosive, tetryl was detected in the two subsurface soil samples collected at soil boring 100SB-2. The tetryl concentrations were 0.97 µg/g (5-7 ft interval) and 1.4 µg/g (10-12 ft interval). There is no LOC established for this compound.

10.6.5.4 Sediment

The off-site and on-site analytical results of the two sediment samples collected in the low-lying swampy portion of Site 100 are presented in **Tables 10-52 and 10-55**, respectively. Marginal exceedances were reported in the off-site analysis for three SVOC compounds and four inorganic analytes. The SVOCs

fluoranthene, phenanthrene and pyrene were detected in both samples at levels above their LOCs. The metals chromium, copper, lead, and mercury were reported at concentrations above their LOCs. No other analytes were detected at concentrations above LOCs. Given the topography of the site, it is not feasible that PAHs found at Sample 100SS-1 would be related to these PAH exceedances.

On-site analysis only detected a low level of methylene chloride in one sample. No other VOCs, SVOCs or pesticides/PCBs were detected in the sediment samples.

10.6.6 Risk Assessment Results

Based on the human health risk assessment approach (**Section 8.0**), estimated cancer risks and noncancer hazards, were quantified for Site 100. Risk assessment details, including procedures used for the selection of site COPCs, chemical-specific factors and soil emission equations for COPCs, Site 100 risk tables, and risk assessment uncertainty analysis, are presented in **Appendix H7**.

Estimated cancer risks and noncancer hazards quantified for realistic exposure scenarios are summarized as follows for current/future industrial research workers and current/future construction excavation workers. For the current/future industrial research worker, routes of exposure evaluated included: incidental ingestion and dermal contact with soil, inhalation of dust particles, and volatilization of constituents in soil to ambient air followed by inhalation. For the current/future construction excavation worker, routes of exposure evaluated included: incidental ingestion and dermal contact with soil, inhalation of dust particles, volatilization of constituents in soil to ambient air followed by inhalation, and dermal contact with constituents in groundwater.

COPCs selected for Site 100 included nine COPCs in surface soil, four COPCs in subsurface soil, and four COPCs in groundwater (**Table 10-60**). Surface water and sediment data from Site 100 were not screened, because exposures to surface water and sediment at Site 100 are deemed incomplete pathways (see **Section 8.2.2.1**). COPCs, by media, are listed below (see **Appendix H7** for details):

Table 10-60
Summary of Site 100 COPCs

COPCs by Media	Surface Soil	Subsurface Soil	Surface Water (No Data)	Sediment (No Data)	Groundwater
Aroclor 1248	X				
Aroclor 1260	X				
Arsenic	X	X			
Benzo(a)anthracene	X				
Benzo(a)pyrene	X	X			
Benzo(b)fluoranthene	X				
Dibenz(a,h)anthracen	X				
Indeno(1,2,3-cd)pyrene	X				
Iron					X
Manganese		X			X
Mercury	X	X			
RDX					X
Sodium					X

These COPCs were generally selected based on risk-based concentrations (RBCs for target cancer risk of 1E-6 and target noncancer hazard of 0.1) and available ARARs (see **Section 8.0** and risk summary Table 2s in Section Q of **Appendix H7**). A summary of estimated risks and hazards for the realistic exposure scenarios is as follows in **Table 10-61** (from **Appendix H7** risk summary Tables 9 and 10):

Table 10-61
Summary of Site 100 Estimated Risks and Hazards

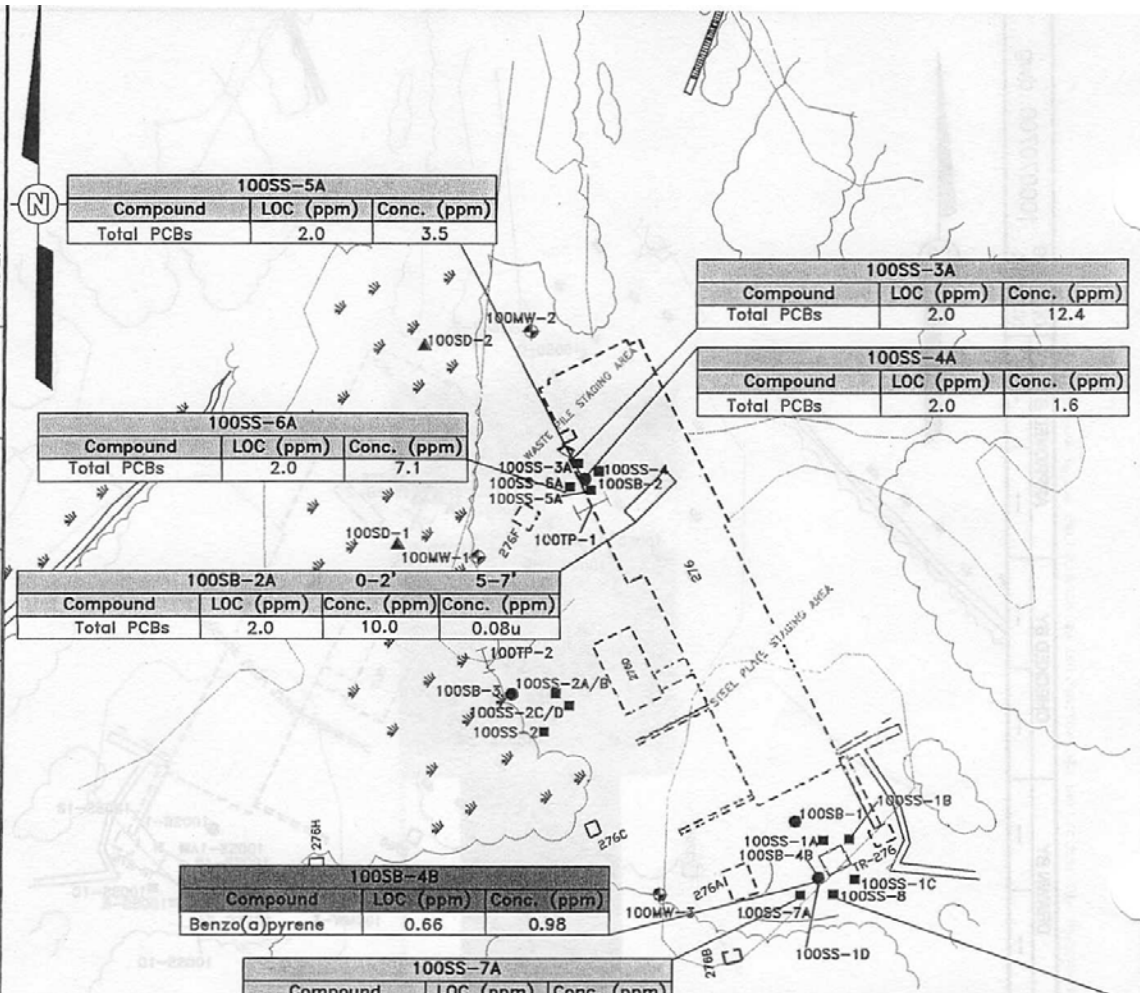
Receptor (Current and Future)	Estimated Total Cancer Risk (RME unless noted)	Cancer Risk Driver(s) (contributing most to total risk)	Media Contributing Most to Cancer Risk
Industrial Research Worker	1.9E-4 (CT = 2.9E-5)	Benzo(a)pyrene, Aroclor-1260, Aroclor-1248, Dibenz(a,h)anthracene, Benzo(b)fluoranthene, Benz(a)anthracene, Indeno(123-cd)pyrene, arsenic	Surface Soil
Construction Excavation Worker	8.3E-7	NR - risks acceptable	NR - risks acceptable
Receptor (Current and Future)	**Estimated Total Noncancer Hazard (RME unless noted)**	**Noncancer Hazard Driver (contributing most to total hazard)**	**Media Contributing Most to Noncancer Hazard**
Industrial Research Worker	0.078	NR - hazards acceptable	NR - hazards acceptable
Construction Excavation Worker	0.46	NR - hazards acceptable	NR - hazards acceptable

NR = not relevant. Cancer risk drivers and/or noncancer hazard drivers not presented because risks and/or hazards acceptable.

The estimated total cancer risk of 1.9E-4 for the RME industrial research worker scenario is based upon the following risks associated with the three exposure pathways evaluated and totaled: 2.1E-5 for ingestion, 6.1E-9 for inhalation, and 1.6E-4 for dermal contact. The listed eight constituent risk drivers each contribute more than 1E-6 cancer risk. For the central tendency (CT) industrial research worker scenario, using average exposure point concentrations (EPCs) for COPCs and not upper-bound EPCs, the estimated total cancer risk drops from 1.9E-4 to 2.9E-5. It should be noted that generally there are no workers at this site, because it is an open storage area. The only activity for a site worker at Site 100 would be moving and staging equipment within the covered staging area. Both AOCs at Site 100 are located outside the staging area and are unlikely to be contacted during routine staging operations. The estimated total hazards for industrial research worker and construction excavation worker scenarios are below USEPA's target noncancer hazard threshold of 1. In addition, the estimated RME risks for the realistic exposure scenario are below USEPA's target cancer risk range of 1E-4 to 1E-6 for the construction excavation receptor.

Since the majority of Site 100 has been relatively inactive since the 1950s, the site site has reverted to its natural condition, contiguous with a forested area. The terrrestrial environmant was evalauted in the Phase II ERA and the sediment samples were evaluated as part of Bear Swamp. Based upon a combination of EEQs and frequency of detection, the primary risk drivers in Bear Swamp appear to be pesticides and mercury. Only mercury was detected in the Site 100 samples. One aspect that is important for risk management is that surface water at some of the sample locations in Bear Swamp is intermittent in nature such as at Site 100, and thus may not support benthic life year-round. As a result, persistent populations of benthic receptors are not expected in many of these areas, so the actual risks to benthic receptors may be less than the predicted risks.

EEQs for the ecoCOPCs detected in soil samples collected at Site 100 during the Round 1 field investigation suggest there is little potential risk to small mammals, vermivorous birds and predatory birds from soil exposure at the site. EEQs for all ecoCOPCs were less than 1 with the exception of arsenic (4.55) in the white-footed mouse.



100SS-5A		
Compound	LOC (ppm)	Conc. (ppm)
Total PCBs	2.0	3.5

100SS-3A		
Compound	LOC (ppm)	Conc. (ppm)
Total PCBs	2.0	12.4

100SS-4A		
Compound	LOC (ppm)	Conc. (ppm)
Total PCBs	2.0	1.6

100SS-6A		
Compound	LOC (ppm)	Conc. (ppm)
Total PCBs	2.0	7.1

100SB-2A		0-2'	5-7'
Compound	LOC (ppm)	Conc. (ppm)	Conc. (ppm)
Total PCBs	2.0	10.0	0.08u

100SB-4B		
Compound	LOC (ppm)	Conc. (ppm)
Benzo(a)pyrene	0.66	0.98

100SS-7A		
Compound	LOC (ppm)	Conc. (ppm)
Benzo(a)anthracene	4.0	6.3
Benzo(a)pyrene	0.66	6.2
Benzo(b)fluoranthene	4.0	7.8
Dibenz(a,h)anthracene	0.66	1.2
Indeno(1,2,3-cd)pyrene	4.0	4.0

100SS-8A		
Compound	LOC (ppm)	Conc. (ppm)
Benzo(a)pyrene	0.66	0.98
Benzo(b)fluoranthene	4.0	5.3
Dibenz(a,h)anthracene	0.66	0.79

RAILROAD
TREE LINE
FENCE
TR-732 TRANSFORMER
BLAST WALL
STS OR CTS STORM SEWER
SS OR SS SANITARY SEWER
EARTH MOUND
BL.DG. NO. BUILDING
BL.DG. NO. FORMER BUILDING
COVERED WALKWAY
SWAMP
WATER

EXISTING SAMPLING LOCATIONS
- MONITORING WELL
- SURFACE WATER/SEDIMENT
- SURFACE SOIL
- SOIL BORING
- TEST PIT

NOTE:
TOPOGRAPHIC CONTOUR SOURCE IS THE IDENTIFICATION AND ANALYSIS OF WETLANDS, FLOODPLAINS, THREATENED AND ENDANGERED SPECIES AND ARCHAEOLOGICAL GEOMORPHOLOGY AT PICATINNY ARSENAL, NJ (WES, 1994), WHICH USED TOPOGRAPHIC CONTOURS DERIVED FROM 1948 SURVEY MAPS. THESE SURVEY MAPS WERE SCANNED TO CREATE ELECTRONIC FILES AND WERE MANUALLY REFINED. WHILE THESE CONTOURS DEPICT GENERAL TOPOGRAPHY WELL, THEY ARE NOT PRECISE IN SOME LOCATIONS.

SCALE
0 100 200 FEET

Picatinny Arsenal Installation Restoration Program

U.S. Army Corps of Engineers

Shaw™ Shaw Environmental, Inc.

FIGURE NO. 10-17
AOC 1: PCB CONTAMINATION IN THE WASTE PILE STAGING AREA AND AOC 2: PAH CONTAMINATION AT TRANSFORMER PAD TR-2
PHASE II RI
PICATINNY ARSENAL, DOVER, NJ

DRAWING NUMBER 100070700..dwg
APPROVED BY
CHECKED BY
DRAWN BY

10.7 SITE 127-BUILDING 230, EXPLOSIVES MELT CASTING FACILITY

10.7.1 Site History: Site 127 – Building 230

Building 230 is located on Phipps Road southwest of its intersection with Fifth Avenue (**Figure 10-18**). The building was constructed in 1918 as a melt and pour facility. Operations at Building 230 involved melting explosives in steel tilt kettles and pouring the molten liquid into shells, mortar, and molds. Currently, the building is still active.

According to PTA personnel, melt and pour operations at Building 230 generated the following waste streams: explosives contaminated wastewater, scrap explosive wastes (e.g., TNT, HMX, RDX, Composition B, octol), and small quantities of solvents (primarily acetone). Wastes were generally stored in drums and staged on concrete flooring prior to off-site management. All waste materials, except the explosives contaminated wastewater, was sent to the PTA Burning Ground for disposal. Explosives contaminated wastewater (process and deluge) was discharged to Building 225 via the trough conveyance system. Periodically, the wastewater trough was used as a temporary waste collection point. Additional explosives contaminated wastewater generated by floor washdown activities was historically discharged directly to the ground through building doorways. The practice of discharging washdown water directly to the ground ceased in 1988.

Two 37.5-KVA pad-mounted transformers (TR-230) were located southeast of Building 230. According to the PTA transformer database, one of the transformers contained Aroclor-1260 at a concentration of 77 ppm. The transformers were removed in the 1990s as part of a facility-wide transformer removal action.

10.7.2 Previous Studies: Site 127 – Building 230

ARDEC Discharge Investigation Project Report, 1991. The investigation indicated that contact contaminated wastewater (equipment wash down) is collected in floor troughs and discharged to the holding tank in Building 225. Other wastewater (steam condensate) discharges to the ground.

According to interviews with PTA personnel, a mercury-filled manometer in Building 230-G ruptured in September 1991, resulting in extensive soil contamination in and around Building 230. Seven roll-off containers of contaminated soil were removed from Site 127, and confirmatory samples were collected as part of an internal investigation of the incident. Pertinent information (e.g., sample location plan, analytical data) regarding the incident is provided in Appendix A of the Work Plan (ICF KE, 1994b).

10.7.3 Summary of Phase II RI Sampling Program

The initial Phase II Round 1 R1 sampling activities at Site 127 were conducted between November 1995 and October 1996. The Phase II Round 1 RI sampling program for Site 127 included:

1. Collecting 17 surface soil samples from seven locations;
2. Collecting 12 subsurface soil samples from six surface soil locations;
3. Installing one monitoring well and collecting five subsurface soil samples; and,
4. Sampling, performing aquifer testing, and surveying the newly installed well.

Follow-up investigations (Round 2) were conducted between November and December 2000 based on the results of the above sampling and regulatory comments and included:

1. Collecting three surface soil samples; and
2. Collecting one subsurface sample.

Table 10-62 provides a list of all the samples that were collected at Site 127 and analyzed as part of the Phase II RI, as well as any deviations from the approved *Final Picatinny Arsenal Phase II RI/FS Final Sampling and Analysis Plan, Volume I, FSP* (ICF KE, 1994a). In addition, **Table 10-62** presents the analyses performed on the samples. Off-site analytical results are presented in **Tables 10-63 through 10-65** for the Round 1 samples, and **Tables 10-68 and 10-69** for the Round 2 samples. Only compounds detected above the CRL are presented in these tables. Compounds detected above their associated LOC are indicated with bold and shading. Sample designations are explained in **Section 3.1** of Volume 1 of this RI Report.

During the Round 1 field investigation, on-site analysis was also performed on all surface soil, subsurface soil and sediment samples. These samples were analyzed on-site for the following analytical

parameters: VOCs, SVOCs, explosives, pesticides/PCBs, and TPH. Only compounds detected above the SQL for on-site analysis are presented in **Tables 10-66 and 10-67**. These tables also provide a listing of all samples that were analyzed on-site. Detailed discussion of both the on-site and off-site analytical programs can be found in **Section 4** of Volume 1 of this report.

10.7.4 Summary of Chemical Analytical Results

The chemical analytical results of the Phase II RI are summarized in this section by sample media and subdivided into off-site and on-site results. Analytical data tables for the off-site and on-site results are presented at the end of this section. Only those analytes detected in at least one sample are presented on the tables. **Figure 10-18** presents the Phase II sampling locations at Site 127.

10.7.4.1 Groundwater

The analytical results of the groundwater sample collected from the one monitoring well in Site 127 are presented in **Table 10-63**. The analytical results are discussed on an area-wide basis in the Groundwater Assessment section for Area H (**Section 10.15**).

10.7.4.2 Surface Soil

Thirteen surface soil samples were collected throughout Site 127 for off-site analysis. Off-site analytical results for the surface soils are provided in **Tables 10-64 and 10-68,** while on-site analytical results for the surface soils are presented in **Table 10-66**. The analytical results of the surficial soil samples are summarized below:

No VOCs were detected at concentrations in excess of their CRLs in the off-site analysis. The SVOC analysis detected low levels of PAHs, but no concentraitons exceeded LOCs. PCB Aroclor 1260 was detected in Sample 127SS-1C at a concentration of 0.56 µg/g, which is below the LOC of 2.0 mg/kg. This sample was collected adjacent to transformer pad TR-230, while samples 127SS-2 through 127SS-6 were collected along the wastewater trough system. PCBs were not analyzed for in the other samples. 2,4,6-TNT was identified in sample 127SS-5 at a concentration of 0.662 mg/kg, which is slightly above the CRL and well below the LOC of 95 mg/kg. Arsenic was detected at concentrations above the LOC in two samples. Samples 127-2A and 127SS-5A had arsenic concentrations of 38 mg/kg and 22.7 mg/kg. which exceed the LOC of 20 mg/kg. No other analytes were detected at levels above their respective LOCs.

On-site analysis revealed only the common laboratory contaminants, methylene chloride, bromomethane and di-n-butylphthalate, during the VOC and SVOC testing. The pesticides, 4,4'-DDE and 4,4'-DDT were detected at low levels below their LOCs. PCB Aroclor 1254 was identified in two samples at concentrations below the PCB LOC.

10.7.4.3 Subsurface Soil

Two subsurface soil samples were collected and analyzed off-site from Site 127. One sample was collected from the soil boring for monitoring well 127MW-1 and the second sample was collected beneath surface soil location 127SS-2A. The off-site analytical results for the subsurface soil sample are provided in **Tables 10-65** (Round 1) and **10-69** (Round 2), while on-site analytical results from 17 subsurface soil samples analyzed on-site are presented in **Table 10-67**. The analytical results are summarized below.

No VOCs, PAHs or explosives were detected at levels above their CRLs. Numerous metals and anions were identified, but all concentrations were below their respective LOCs.

The only compounds detected during on-site analysis were low levels of 4,4'-DDE; 4,4'-DDT and several SVOCs in the two samples collected from the 2-4 ft depth interval at sample location 127SS-2. Concentrations of the following SVOCs exceeded their respective LOCs in sample 127SS-2B: benz(a)anthracene (4.5 mg/kg), benzo(a)pyrene (3.3. mg/kg), bis (2-chloroethyl) ether (3.3 mg/kg.), dibenz(a,h)anthracene (3.3 mg/kg), hexachlorobenzene (3.3 mg/kg), and n-nitroso-di-n-propylamine (3.3 mg/kg).

10.7.5 Risk Assessment Results

Based on the human health risk assessment approach (**Section 8.0**), estimated cancer risks and noncancer hazards, were quantified for Site 127. Risk assessment details, including procedures used for the

selection of site COPCs, chemical-specific factors and soil emission equations for COPCs, Site 127 risk tables, and risk assessment uncertainty analysis, are presented in **Appendix H7**.

Estimated cancer risks and noncancer hazards quantified for realistic exposure scenarios are summarized as follows for current/future industrial research workers and current/future construction excavation workers. For the current/future industrial research worker, routes of exposure evaluated included: incidental ingestion and dermal contact with soil, inhalation of dust particles, and volatilization of constituents in soil to ambient air followed by inhalation. For the current/future construction excavation worker, routes of exposure evaluated included: incidental ingestion and dermal contact with soil, inhalation of dust particles, volatilization of constituents in soil to ambient air followed by inhalation, and dermal contact with constituents in groundwater.

COPCs selected for Site 127 included three COPCs in surface soil, one COPC in subsurface soil, and two COPCs in groundwater (**Table 10-70**). COPCs, by media, are listed below (see **Appendix H7** for details):

Table 10-70
Summary of Site 127 COPCs

COPCs by Media	Surface Soil	Subsurface Soil	Surface Water (No Data)	Sediment (No Data)	Ground-water
Aluminum					X
Arsenic	X	X			
Bis(2-ethylhexyl)phthalate					X
Manganese	X				
Mercury	X				

These COPCs were generally selected based on risk-based concentrations (RBCs for target cancer risk of 1E-6 and target noncancer hazard of 0.1) and available ARARs (see **Section 8.0** and risk summary Table 2s in Section Q). A summary of estimated risks and hazards for the realistic exposure scenarios is as follows in **Table 10-71** (from **Appendix H7** risk summary Tables 9 and 10):

Table 10-71
Summary of Site 127 Estimated Risks and Hazards

Receptor (Current and Future)	Estimated Total Cancer Risk (RME unless noted)	Cancer Risk Driver(s) (contributing most to total risk)	Media Contributing Most to Cancer Risk
Industrial Research Worker	2.0E-5	Arsenic	Surface Soil
Construction Excavation Worker	2.5E-7	NR - risks acceptable	NR - risks acceptable
Receptor (Current and Future)	**Estimated Total Noncancer Hazard (RME unless noted)**	**Noncancer Hazard Driver (contributing most to total hazard)**	**Media Contributing Most to Noncancer Hazard**
Industrial Research Worker	0.32	NR - hazards acceptable	NR - hazards acceptable
Construction Excavation Worker	0.039	NR - hazards acceptable	NR - hazards acceptable

NR = not relevant. Cancer risk drivers and/or noncancer hazard drivers not presented because risks and/or hazards acceptable.

The estimated total cancer risk of 2.0E-5 for the industrial research worker scenario is based upon the following risks associated with the three exposure pathways evaluated and totaled: 6.5E-6 for ingestion, 8.0E-9 for inhalation, and 1.4E-5 for dermal contact. The estimated total hazards for industrial research worker and construction excavation worker scenarios are below USEPA's target noncancer hazard threshold of 1. In addition, the estimated RME risks for the realistic exposure scenario are below USEPA's target cancer risk range of 1E-4 to 1E-6 for the construction excavation receptor.

No ERA was conducted for Site 127 because most site samples were collected in mowed areas surrounded by buildings and pavement. Little cover is available. As a result, foodchain effects are unlikely.

10.7.6 Areas of Concern

Based on the analytical results from Site 127 during the Phase II Round 1 RI. The following AOC was identified at Site 127.

- AOC 1: Arsenic contamination in surface soil

AOCs represent those areas within each site that may require institutional controls, engineering controls and/or remedial alternatives to mitigate, treat, or remove the impacted media. The AOCs do not include every single exceedance of LOCs at a site. Factors considered during the determination of the AOCs included the following: number and magnitude of the exceedances relative to the LOCs, whether the results could be attributable to natural background levels (e.g., metals and radiological parameters), mobility of the contaminants (e.g., low mobility of PCBs), toxibity based on existing toxicological date (e.g., low toxicity of NC and PETN), and evidence of site-related anthropogenic contamination (e.g., explosives). Following identification of the AOCs, contamination at each site was evaluated in a HHRA.

10.7.6.1 AOC 1: Arsenic Contamination in Surface Soil

Analytical results from the Phase II Round 1 investigation indicated two surface soil samples with concentrations in excess of the arsenic LOC of 20 mg/kg. Samples 127SS-2A and 127SS-4A had arsenic concentrations of 38 mg/kg and 22.7 mg/kg, respectively. These samples were collected beneath the wastewater trough conveyance system which links Building 230 to a 4,000 gallon collection tank in Building 225. Similar arsenic concentrations were reported in samples 55SS-2A, 55SS-3A and 55SS-4A collected near the troughs at Building 230 as part of the Site 55 characterization. Samples 55SS-2A and 55SS-3A had arsenic concentrations of 40 mg/kg, while sample 55SS-4A contained arsenic at 20 mg/kg. Characterization of the extent of arsenic contamination identified in the Site 55 samples is presented in **Section 10.2.7.1**.

In order to characterize the extent of arsenic contamination at Site 127, three surface soil samples and one subsurface soil sample were collected during the Phase II Round 2 field investigation. Surface soil samples 127SS-8 to 127SS-10 were collected within 20 feet of Round 1 sample 127SS-2A. Subsurface soil sample 127SB-1B was collected from 5 to 7 ft bgs beneath 127SS-2A. All samples were analyzed for arsenic. In addition, the samples were analyzed for PAHs, because on-site analysis of sample 127SS-2B, collected from 2 to 4 ft bgs beneath 127SS-2A, detected concentrations of six SVOCs in excess of their respective LOCs.

No LOC exceedances were reported in the four samples collected during Round 2. Thus, the horizontal extent of this AOC is delineated by samples 127SS-8, 127SS-9, 127SS-10 and 127MW-1A. The vertical extent of this AOC, is delineated to 5 ft by 127SB-1B. The most likely source of this contamination is leaks or spills from the wastewater trough. Another possible source is the application of arsenical herbicides to prevent excessive vegetation along the open trough.

10.7.7 Fate and Transport of Site Contaminants

The concentrations and distribution of contaminants at Site 127 were described in detail in preceding subsections of the report. The potential risks associated with exposure to these chemicals also were presented in this report. Based on the results of the HHRA in addition to the screening criteria outlined in **Section 7.3**, arsenic was identified as a primary risk driver in surface soil even thought the cumulative risk level is within the target risk range. Arsenic was identified as a primary risk at all the Area H sites. Arsenic was detected in the soil above the LOC of 20 mg/kg in samples 127SS-2A (38 mg/kg) and 127SS-5A (22.7 mg/kg). Thus, arsenic was selected for fate and transport evaluation.

10.7.7.1 Arsenic

Arsenic was detected above the LOC of 20mg/kg in two soil samples collected beneath the wastewater trough conveyance system. The most common forms of arsenic found in nature (As^{+5} and As^{+3}) are typically found in aqueous solution as arsenate (AsO_4^{-3}) and arsenite (AsO_2^{-1}), respectively. However, the metallic (0 state) and –3 state may also occur. Both arsenate and arsenite are toxic; however, arsenite is the more toxic form, and arsenate is the most common form. Arsenate is relatively immobile in the environment due to its formation of insoluble complexes with iron, aluminum, and calcium. The presence of iron is the most effective in controlling the mobility of arsenate. The relative immobility of arsenic is evidenced at Site 127 by the absence of elevated levels of arsenic in subsurface soil samples collected from downgradient soil borings 127MW-1 and 55SB-1 and downgradient groundwater samples from monitoring wells 127MW-1 and 55MW-2.

Arsenical herbicides and pesticides, which may have been used at the site to control weeds along the trough and insect populations from the adjacent swamp, tend to adhere to fine soil particles and organic matter. They become tightly bound to the soil matrix, which limits the vertical migration within the soil column. Due to their low solubility in water, arsenical pesticides pose only a minimal threat to groundwater (NJDEP, 1999b).

10.7.8 Summary and Recommendations

Recommendations for each AOC identified at Site 127 are provided in the following subsections and are based on characterization of the nature and extent of the contamination as well as potential risk associated with the chemical concentrations detected in the AOCs.

10.7.8.1 AOC 1: Arsenic Contamination in the Surface Soil

Eleven surface soil samples and three subsurface soil samples were collected to characterize the nature and extent of contamination at Site 127. Arsenic was the only compound detected above LOCs during off-site analysis. Arsenic was detected above the LOC in two surface soil samples. Subsurface soil samples did not contain any LOC exceedances.

Based on the current use of PTA, a HHRA was conducted to evaluate site worker exposure to surface soil and construction excavation worker exposure to subsurface soil at Site 127. The results of the HHRA indicated that the estimate total cancer risk for exposure to surface soil is within USEPA's target cancer risk range of 1E-4 to 1E-6, and the estimate total hazard from surface soil exposure is below USEPA's target noncancer hazard threshold of 1. Although the surface soil risks are within the target risk range, arsenic was idenitified as a primary risk driver. The risk and hazard from exposure to subsurface soil are below the target levels. There is little cover for terrestrial species at Site 127. Thus, foodchain effects are unlikely.

Site 127 has been included in the *Engineering Controls Waiver Document* (Shaw, 2003), because of the limited extent and magnitude of the LOC exceedances. The extent of this AOC is limited to a 20 square foot area around 127SS-2A. Institutional controls are recommended to restrict contact with the surface soil contamination at this AOC.

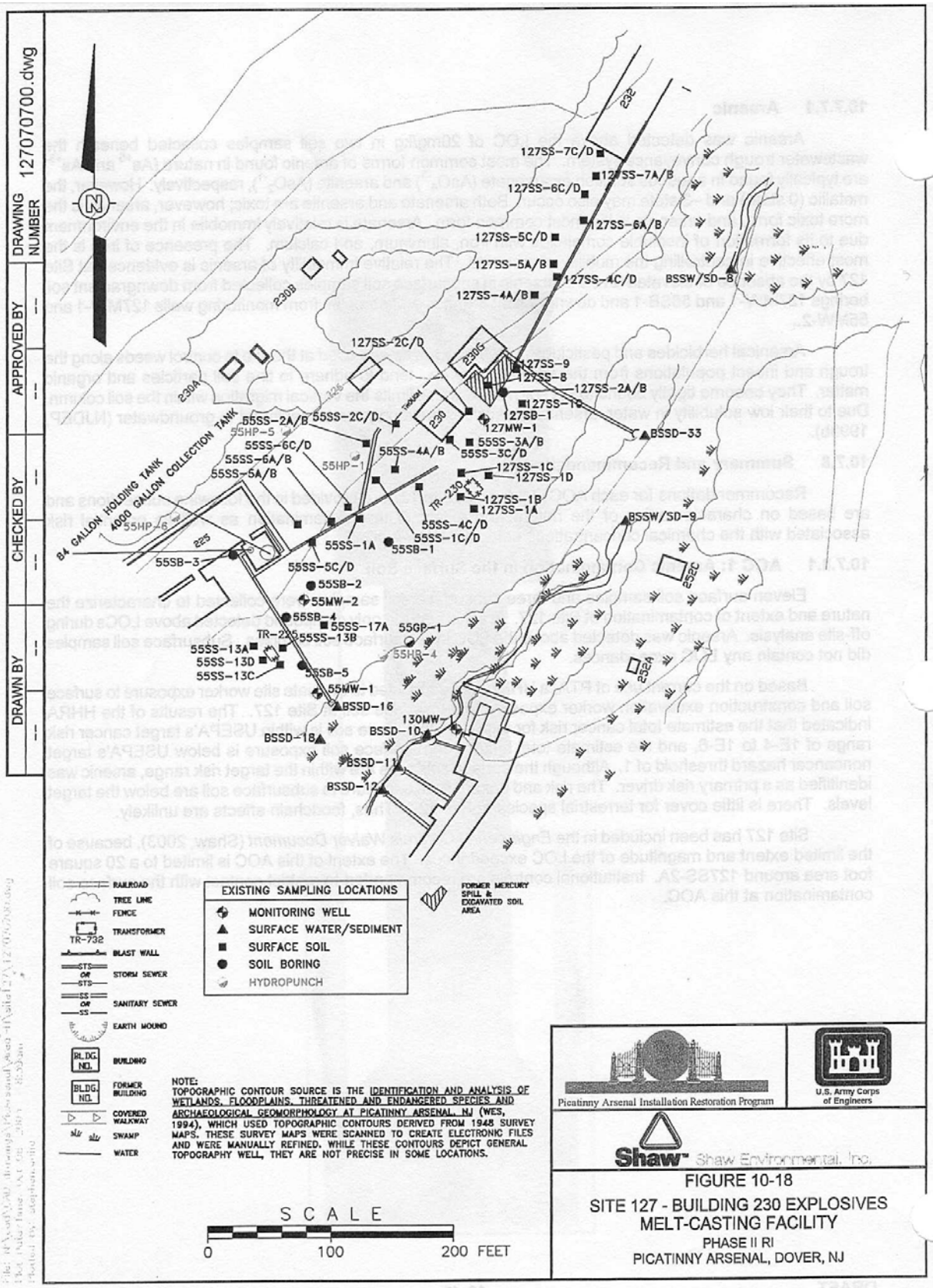


FIGURE 10-18

SITE 127 - BUILDING 230 EXPLOSIVES MELT-CASTING FACILITY

PHASE II RI

PICATINNY ARSENAL, DOVER, NJ

10.13 SITE 151, BUILDING 600, CHANGE HOUSE

10.13.1 Site History: Site 151, Building 600

Building 600 (**Figure 10- 27**) was a one-story, 6,300 ft^2 structure, which was constructed in 1942 as a change house. Sometime around 1978, Building 600 was used as a training ground for military Special Weapons Assault Team training maneuvers. The training maneuvers involved the use of hand grenades, rockets, and other small-scale explosives. In 1992, Building 600 underwent an asbestos abatement and was demolished. Air monitoring for asbestos during the abatement project indicated all results were within federal standards for airborne asbestos. Since the building sde,molition, the open area was used to store wood for building decontamination by burning.

Change house equipment included laundry, lavatory, and shower facilities. Because personnel who used these facilities worked with explosives, wastewater from washing operations may have been contaminated with explosive compounds such as HMX, RDX, and Composition B. The explosives contaminated wastewater was discharged to a dry well before Building 600 was connected to the sanitary sewer system sometime in the 1960s. Based on the suspected location of the dry well (**Figure 10-27**) and a review of engineering drawing, DP-45171 from June 1942, the alleged dry well was a manhole connected to the storm sewer system. The suspected dry well can be seen in the site phtographs with the site figures.

10.13.2 Previous Studies: Site 151, Building 600

No building-specific studies have been conducted at Building 600.

10.13.3 Summary of Phase II RI Sampling Program

Phase II RI (Round 1) sampling activities at Site 151 were conducted between December 1995 and October 1996. The Phase II Round 1 RI sampling program for Site 151 included:

1. Collecting five surface soil samples from three locations;
2. Installing one monitoring well; and,
3. Sampling, performing aquifer testing, and surveying the newly installed well.

Follow-up investigations (Round 2) were conducted between November 2000 and December 2000 based on the above sampling and regulatory comments. The Round 2 sampling included:

1. Installing one monitoring well
2. Sampling the existing well and newly installed well; and
3. Surveying the newly installed well.

Table 10-124 provides a list of all the samples that were collected at Site 151 and analyzed as part of the Phase II RI, as well as any deviations from the approved *Final Picatinny Arsenal Phase II RI/FS Final Sampling and Analysis Plan, Volume I, FSP* (ICF KE, 1994a). In addition, **Table 10-124** presents the analyses performed on the samples. Off-site analytical results for the Round 1 samples are presented in **Tables 10-125 and 10-126**, and the Round 2 results are presented in **Table 10-128**. Only compounds detected above the CRL are presented in these tables. Compounds detected above their associated LOC are indicated with bold font and shading. Sample designations are explained in **Section 3.1** of Volume 1 of this RI Report.

During the Round 1 field investigation, on-site analysis was also performed on all surface soil samples. These samples were analyzed on-site for the following analytical parameters: VOCs, SVOCs, explosives, pesticides/PCBs, and TPH. Only compounds detected above the SQL for on-site analysis are presented in **Table 10-127**. These tables also provide a listing of all samples that were analyzed on site. Detailed discussion of both the on-site and off-site analytical programs can be found in **Section 4** of this report.

10.13.4 Chemical Analytical Sampling Results

The chemical analytical results of the Phase II RI have been summarized in this section by sample media and subdivided into off-site and on-site results. Analytical data tables for the off-site and on-site results are presented at the end of this section. Only those analytes detected in at least one sample are presented on the tables. **Figure 10-27** presents the Phase II sampling locations at Site 151.

10.13.4.1 Groundwater

The analytical results of the groundwater samples collected from the monitoring wells in Site 151 are presented in **Tables 10-125** (Round 2) and **10-128** (Round 2). The analytical results are discussed on an area-wide basis in the Groundwater Assessment section for Area H (**Section 10-15**).

10.13.4.2 Surface Soil

Off-site analytical results for the three surface soil samples are provided in **Table 10-126**, while on-site analytical results for five surface soils are presented in **Table 10-127**. The analytical results of the surficial soil samples are summarized below:

Explosives were not detected in the three samples analyzed off-site. All inorganics and anions levels were below their LOCs.

VOCs, PCBs, pesticides and explosives were not detected at concentrations above their respective SQLs in the on-site sample analysis. Di-n-butyl phthalate, a common laboratory contaminant, was detected at a low level in one sample.

No subsurface soil samples could be collected because of the presence of competent bedrock within 4 feet of the surface. The surface soil samples were characterized as weathered bedrock.

10.13.5 Risk Assessment Results

For the purposes of the screening evaluation, soil and sediment concentrations were compared to USEPA Region III Industrial Soil RBCs, while groundwater and surface water concentrations were compared to USEPA Region III Tap Water RBCs. A discussion of the methodology used in the screening-level human health risk assessment is presented in **Section 8** of Volume1. The RBCs used in this evaluation were back-calculated using two health-based levels. Essential human nutrients that do not have RBCs were compared to dietary ADIs, and lead was compared to USEPA screening and action levels. Chemicals detected at concentrations exceeding first or second level RBCs (or other screening criteria) are summarized by environmental medium in **Table 10-129**.

As shown, one inorganic chemical, arsenic, was detected at concentrations above its first level RBCs in surface soil. Lead exceeded its screening level in groundwater in the single sample collected, at a concentration of 25.1 µg/L, which is above its screening level of 15 µg/L. No organic chemicals were detected above RBC levels and no inorganic chemicals were detected at concentrations above first level RBCs in more than one medium. In addition, no compounds were detected at concentrations above second level RBCs.

A default human health risk assessment was conducted for Site 151 because detected chemical concentrations in the soil were between first- and second-level RBCs. A discussion of the methodology used in the default risk assessment is presented in **Section 8.2** of Volume 1.

The following exposure pathways were quantitatively evaluated in the default risk assessments for Site 151: Incidental ingestion and dermal absorption of chemicals in surface soil by site worker. An explanation of the selection of only this exposure pathway is presented in **Section 8.2.2.1** of Volume 1.

The results of the default human health risk assessment are summarized in **Table 10-130**. **Table 10-130** indicates that the cumulative risk is within USEPA's target risk range of 1E-4 to 1E-6 with the risk driver being arsenic in the surface soil. However, the maximum arsenic contraction detected in the surface soil was 7.27, which is well below the LOC of 20 mg/kg. The cumulative hazard index from exposure to surface soil by site workers is below USEPA's non-carcinogenic hazard threshold of 1.

Due to the small size of this site (0.5 acre), low on-site habitat value (majority of the site is asphalt pavement), and continued use of the site as a debris storage area, Site 151 was not evaluated in the Phase II ERA.

10.13.6 Areas of Concern

Based on the analytical results from Site 151 during the Phase II RI, no AOCs have been identified at Site 151. Areas of concern and recommendations for groundwater are discussed on an area-wide basis in **Section 10.15**.

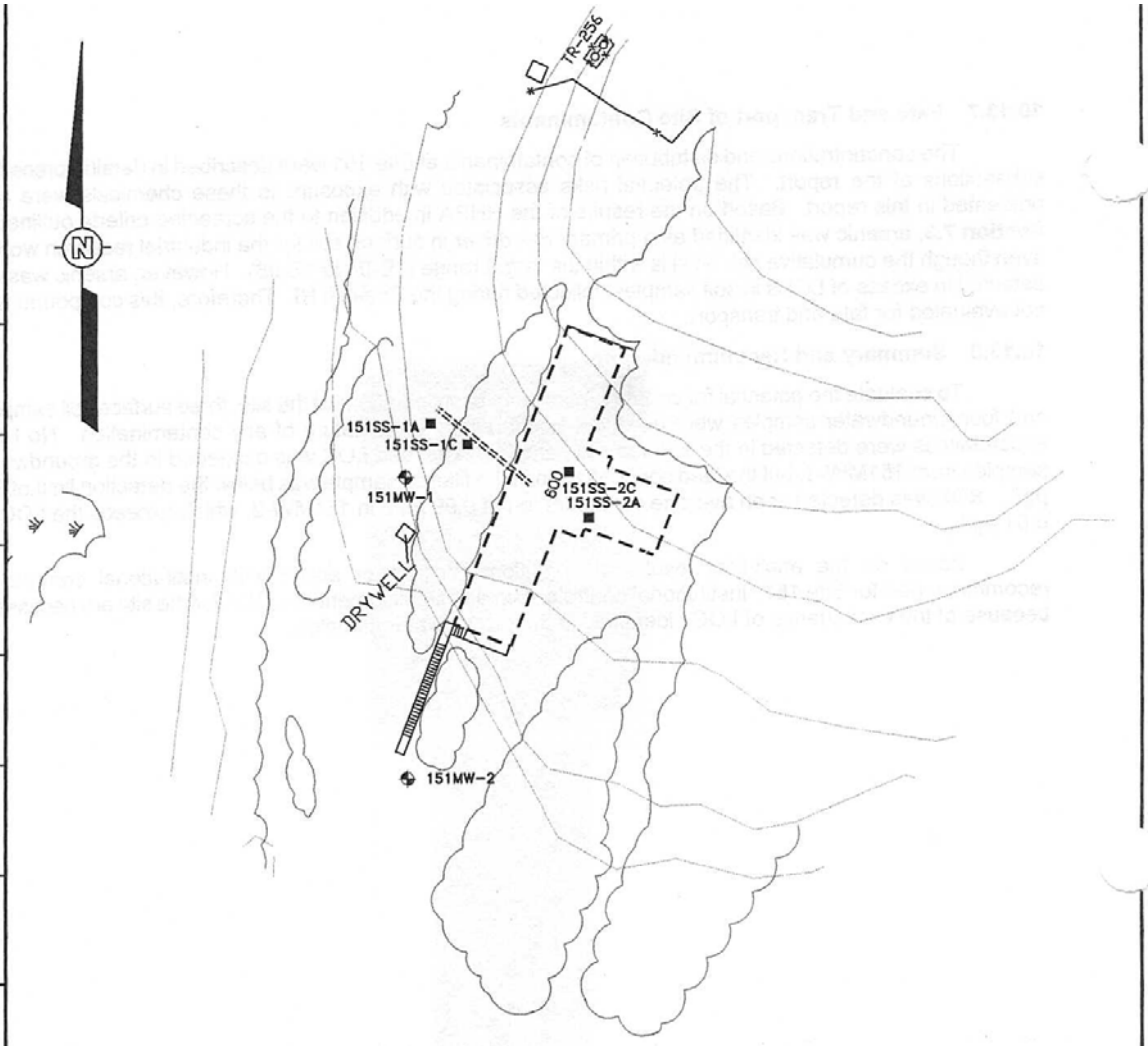
10.13.7 Fate and Transport of Site Contaminants

The concentrations and distribution of contaminants at Site 151 were described in detail in preceding subsections of the report. The potential risks associated with exposure to these chemicals were also presented in this report. Based on the results of the HHRA in addition to the screening criteria outlined in **Section 7.3**, arsenic was identified as a primary risk driver in surface soil for the industrial research worker even though the cumulative risk level is within the target range (1E-04 to 1E-06). However, arsenic was not detected in excess of LOCs in soil samples collected during the Phase II RI. Therefore, this compound was not evaluated for fate and transport.

10.13.8 Summary and Recommendations

To evaluate the potential for contamination from past operations at the site, three surface soil samples and four groundwater samples were collected to characterize the nature of any contamination. No LOC exceedances were detected in the surface soil samples. The lead LOC was exceeded in the groundwater samples from 151MW-1, but the lead concentration in the filtered sample was below the detection limit of 3.0 µg/L. RDX was detected at an average concentration of 0.99 µg/L in 151MW-2, which exceeds the LOC of 0.61 µg/L.

Based on the analytical results, a conditional no further action with institutional controls is recommmended for Site 151. Institutional controls such as establishment of a CEA for the site are necessary because of the exceedance of LOCs identified in the groundwater samples.



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RAILROAD
TREE LINE
FENCE
TRANSFORMER (TR-732)
BLAST WALL
STORM SEWER (STS or STS)
SANITARY SEWER (SS or SS)
EARTH MOUND
BUILDING (BLDG. NO.)
FORMER BUILDING (BLDG. NO.)
COVERED WALKWAY
SWAMP
WATER

EXISTING SAMPLING LOCATIONS	
MONITORING WELL	
SURFACE SOIL	

NOTE:
TOPOGRAPHIC CONTOUR SOURCE IS THE IDENTIFICATION AND ANALYSIS OF WETLANDS, FLOODPLAINS, THREATENED AND ENDANGERED SPECIES AND ARCHAEOLOGICAL GEOMORPHOLOGY AT PICATINNY ARSENAL, NJ (WES, 1994), WHICH USED TOPOGRAPHIC CONTOURS DERIVED FROM 1948 SURVEY MAPS. THESE SURVEY MAPS WERE SCANNED TO CREATE ELECTRONIC FILES AND WERE MANUALLY REFINED. WHILE THESE CONTOURS DEPICT GENERAL TOPOGRAPHY WELL, THEY ARE NOT PRECISE IN SOME LOCATIONS.

SCALE
0 80 160 FEET

Picatinny Arsenal Installation Restoration Program

U.S. Army Corps of Engineers

Shaw Environmental, Inc.

FIGURE NO. 10-27
SITE 151 - BUILDING 600
CHANGE HOUSE
PHASE II RI
PICATINNY ARSENAL, DOVER, NEW JERSEY

XREF Files: IMAGE Files: A$C40F50808.DIB A$C461554C6.DIB A$C64531568E.DIB oce.gif itlogo.gif piclogo3.tif
File: N:\cad\CAD drawings\PicArsenal\Area-H\site151\151070900.dwg
Plot Date/Time: Sep 29, 2003 - 2:53pm
Plotted By: stephen.wate

10.15 AREA-WIDE GROUNDWATER SUMMARY

A total of 26 monitoring wells were sampled at 11 sites in Area H in the initial investigation (Round 1). Additional follow-up sampling (Round 2) included re-sampling of 15 existing monitoring wells, installation and sampling of two additional monitoring wells, and groundwater sampling from 13 Hydropunch/Geoprobe locations. Results exceeding the groundwater LOCs for these samples are presented on **Figure 10-31**. A complete data summary for the Area H groundwater samples can be found in the site-specific analytical data tables presented at the end of each site characterization. In general, SVOCs, pesticides, PCB, anions and fuel-related compounds were not detected at concentrations above their LOCs. The primary contaminants of concern were explosives and VOCs. Metals were also identified at concentrations in excess of LOCs, but aluminum and iron are common metals found throughout PTA at elevated levels in the groundwater. The elevated concentrations are suspected to be related to the local geology, which is rich in these compounds (Sims, 1958). Other than these metals, lead is the only possible inorganic COPC in groundwater. A summary of the groundwater analytical results for Area H is provided below.

10.15.1 Groundwater Analytical Assessment

VOLATILE ORGANIC COMPOUNDS

Eleven VOCs were detected in the Area H groundwater samples, but only methylene chloride, TCE and PCE were detected at concentrations in excess of their LOCs.

TCE was detected at concentrations above the LOC of 1 µg/L at three monitoring wells and two hydropunch locations in the southwestern portion of Area H. The TCE concentrations detected in the well samples were 1.7 to 3.9 µg/L at 64MW-1, 9.3 to 10 µg/L at 64MW-2 and 2.7 to 3.0 µg/L at 131MW-3. TCE was detected above the LOC in hydropunch sample 64HP-1 at 6.9 µg/L and hydropunch sample 131HP-3 at 1.6 µg/L. TCE was also detected in monitoring wells 62MW-1 (0.53 µg/L) and 130MW-1 (0.35 µg/L) as well as hydropunch locations 131HP-1 (0.63 µg/L) and 131HP-5 (0.44 µg/L) at concentrations below the LOC.

Methylene chloride and PCE were detected in Sample 130MW-1 at concentrations of 2.8 µg/L and 1.6 µg/L, respectively during the Round 1 sampling. These concentrations slightly exceed the LOCs for methylene chloride (2.0 µg/L) and PCE (1.0 µg/L). However, the concentration of methylene chloride is suspect, because it was also found in the associated rinse blank and methylene chloride was not detected in the Round 2 sampling of 130MW-1. The methylene chloride result from Round 1 was qualified accordingly during data validation. These two compounds were not detected in the other two groundwater samples collected from Site 130 or the soil samples collected from this site. The PCE concentration reported in 130MW-1 during the Round 2 sampling was 0.60 µg/L, which is below the LOC. Methylene chloride was also identified above its LOC at 3.0 µg/L in the groundwater sample from Monitoring Well 131MW-1. Methylene chloride was not detected in the other groundwater samples collected from Site 131 or the Round 2 samples including the re-sampling of 131MW-1. The remaining VOC concentrations were below LOCs.

Carbon disulfide was detected only in the Round 2 samples collected at 130MW-1 (1.10 µg/L), 131MW-3 (20 µg/L), and 151MW-2 (0.57 µg/L). Bromodichloromethane and dibromochloromethane were detected in one hydropunch sample from Site 131. 1,1-Dichloroethene and cis-1,2-dichloroethene were detected in individual well samples from Sites 64 and 131, respectively. Chloroform was detected at Site 100, Site 128 and Site 131. Chloroform was also detected in the associated rinse blank samples for Sample 100MW-2. Toluene was identified in individual wells at Site 55, Site 64, Site 130, and Site 131 during the Round 1 RI. All concentrations were less than 1 µg/L. Toluene was also detected in three of the four samples from Site 128 at concentrations slightly above the CRL; however, it was also detected in the associated rinse blank. All toluene levels were below the LOC for toluene of 1,000 µg/L. Toluene was not detected in the Round 2 samples. 1,1,2-Trichchloro-1,2,2,trifluoroethane was detected below its LOC of 59,000 µg/L at Site 98, Site 130 and Site 131.

SEMIVOLATILE ORGANIC COMPOUNDS/PESTICIDES/ PCBs

bis(2-Ethylhexyl)phthalate was the only SVOC detected in the Area H groundwater samples. It was detected in one well, 127MW-1, at a concentration of 7.9 µg/L. The LOC for bis(2-ethylhexyl)phthalate is 30 µg/L. No PCBs were detected in the Area H wells. The pesticide, malathion, was identified in samples from Site 55, Site 100, and Site 128. The results from Site 55 were qualified due to malathion in the associated

rinse blank. The malathion concentrations reported at Sites 100 and 128 were below 1 µg/L, which is well below the LOC of 200 µg/L.

EXPLOSIVES

Nine explosives compounds were detected in the Area H monitoring wells. RDX and 2,4,6-TNT were the only explosive compounds detected at concentrations in excess of their LOCs. Concentrations of RDX at 55MW-1 (2.16 µg/L) and 55MW-2 (27.6 µg/L) in Site 55 exceeded the LOC of 0.61 µg/L in the initial investigation. The collection of two geoprobe groundwater samples and the re-sampling of the three monitoring wells at Site 55 during the Round 2 investigation identified seven explosives in the samples. The only LOC exceedance reported in the samples was 0.88 µg/L of RDX in 55MW-2. RDX was reported in Sample 132MW-2 at a concentration of 17.6 µg/L (Round 1) and 7.70 µg/L (Round 2). RDX also exceeded the LOC in sample 151MW-2 (0.99 µg/L) and sample 100MW-2 (1.41 µg/L). The only 2,4,6-TNT exceedance was reported in Round 1 sampling at 55MW-2, at a concentration of 8.51 µg/L, which exceeds the LOC of 2.0 µg/L. 2,4,6-TNT was not detected in any other wells in Area H. The TNT concentration reported in 55MW-2 during the Round 2 investigation was below the LOC. Other explosive compounds detected in the Area H groundwater samples include 2, amino-4,6-DNT; 4-amino-2,6-DNT; 2,4-DNT; HMX; nitrobenzene; 4-nitrotoluene; and picric acid. All concentrations of these compounds were below LOCs.

METALS/ ANIONS

The metals aluminum and iron were detected at concentrations above their LOCs in seven of the eleven sites within Area H. These metals occur naturally and are not considered contaminants of concern. These analytes are not expected to be related to site activities. The source of these compounds is believed to be weathering of the local geologic materials, which are rich in these elements (Sims, 1958). At Site 132, cadmium, lead and manganese were detected at concentrations in excess of their LOCs. The cadmium concentration detected in monitoring well 132MW-2 of 4.06 µg/L only slightly exceeds the LOC of 4.00 µg/L. Lead was detected in 132MW-1 at a concentration of 18.1 µg/L, which exceeds the LOC of 10.0 µg/L. The lead and cadmium concentrations may be related to surface soil contamination reported at Building 271-D during the Phase II RI. Manganese was detected in groundwater at Site 132 at concentrations as high as 43,200 µg/L (Sample 132HP-3). Manganese also occurs naturally and has been documented at high levels in this physiographic portion of New Jersey. However, the very high levels reported in Site 132 groundwater samples suggest an additional anthropogenic source. The high manganese concentrations may be related to the storage of manganese dioxide in Building 271-I. Manganese was detected above the LOC OF 50 µg/L in all four hydropunch samples and both wells. As part of the Round 2 investigation, filtered and unfiltered groundwater samples were analyzed from the Site 132 wells. The manganese concentrations in the filtered and unfiltered samples were below the LOC for 132MW-1 and above the LOC for 132MW-2. Filtering of the samples had very little affect on the manganese concentrations identified at 132MW-2. The unfiltered sample had a manganese concentration of 7,400 µg/L and the filtered sample had only a slight reduction to 7,000 µg/L.

Lead was also detected at slight exceedances in Site 128 and Site 151. Lead was detected in 128MW-3 above the LOC in the initial sampling (Round 1) but not in the follow-up sampling (Round 2). Filtered and unfiltered samples were collected in Round 2 for lead analysis, and the results indicate higher lead concentrations in the unfiltered samples, suggesting that particulates may account for the higher lead concentrations. Lead concentrations were similarly higher in the unfiltered versus filtered sample from 151MW-1. Lead exceeded the LOC in the unfiltered sample but not the filtered sample, indicating the LOC exceedance is related to suspended solids in the groundwater. Magnesium was reported at a concentration in excess of the LOC of 80,500 µg/L at Site 64. Anions did not exceed their respective LOCs in any sample. Fuel-related compounds were not detected in the samples.

10.15.2 Groundwater Contamination Assessment

Based on the analytical results of groundwater samples collected in Area H during the Phase II RI, the following areas of concern (AOCs) have been identified within the groundwater.

1. Explosives contamination of shallow groundwater at Site 55
2. TCE contamination at Sites 64 and 131
3. PCE contamination at Monitoring Well 130MW-1
4. RDX and manganese contamination at Monitoring Well 132MW-2

5. Metals contamination throughout Area H

AOCs represent those areas within a site that may require institutional controls, engineering controls, and/or remedial alternatives to treat, mitigate or remove the impacted media. AOCs do not include every single exceedance of LOCs at a site. Factors considered during the determination of the AOCs included the following: number and magnitude of the exceedances related to the LOCs, whether the results could be attributable to natural background levels (e.g., metals and radiological parameters), mobility of the contaminants (e.g., low mobility of PCBs), toxicity based on existing toxicological data (e.g., low toxicity of NC and PETN), and evidence of site-related anthropogenic contamination (e.g., explosives).

10.15.2.1 GW AOC1: Explosives Contamination of Shallow Groundwater at Site 55

RDX and 2,4,6-TNT were detected in the groundwater at Site 55 at concentrations above their LOCs (**Figure 10-32**). Elevated RDX levels were also reported in the sediment and surface water samples collected from Bear Swamp, which borders Site 55 to the southeast.

Activities conducted at Buildings 221, 223, and 225 include explosive unit machining, testing, inspection and storage. PTA personnel reported that materials used at these buildings were limited to explosives, radioactive materials (Cobalt-60 and DU), and small amounts of solvents (primarily acetone) and propellants.

Wastewater generated from explosives and propellant operations at Building 225 is collected by floor troughs and conveyed through plastic pipes to a 4,000-gallon collection tank. The collection tank formerly received explosives contaminated wastewater from Buildings 221, 223, 230, 231, and 232 via a wooden trough conveyance system. The trough emptied to a stainless steel tank with baffles and a filter basket, which overflowed to a sawdust filter box and finally discharged to Bear Swamp Brook. Discharges to Bear Swamp Brook were discontinued around 1965. PTA personnel reported incidents of tank overflows and leaks, although no records were available. One incident involved the discharge of approximately 25 gallons of propellant-contaminated wastewater. Subsequent environmental inspections revealed that the trough system was leaking. In response to the inspections, the trough system was repaired.

Explosives detected in the groundwater samples collected from the monitoring wells at Site 55 include picric acid, HMX, RDX, and 2,4,6-TNT. During the Round 1 investigation, concentrations of RDX at 55MW-1 and 55MW-2 exceeded the LOC of 0.61 µg/L. The LOC for 2,4,6-TNT was also exceeded at 55MW-2. Groundwater from monitoring well 55MW-2 contained all four explosive compounds. Monitoring well 55MW-2 is located hydraulically downgradient of the explosives wastewater holding tank and the trough system but upgradient of the swamp. Surface water samples collected in Bear Swamp in the vicinity of Site 55 also contained RDX above the LOC.

In order to further delineate the extent of this AOC, several hydropunch samples were proposed at Site 55 as part of the Round 2 investigation. Due to access problems as a result of the covered walkway, the wastewater trough, and the steep rocky slope behind Building 255, many of these samples could not be collected including all the intended upgradient samples (see **Figure 10-32**). An upgradient monitoring well was also proposed for installation based on the results of the hydropunch sampling, but since no upgradient locations could be accessed with a drill rig, the upgradient well was not installed. Two geoprobe groundwater samples (55GP-1 and 55GP-2) were collected near the shore of Bear Swamp and the three monitoring wells were re-sampled for explosives analysis. Concentrations of explosive compounds were again highest in Sample 55MW-2. RDX was the only explosive detected at a concentration above an applicable LOC. All explosive concentrations were lower in the Round 2 sampling event. The RDX concentration detected in 55MW-2 decreased from 27.6 µg/L (Round 1) to 0.88 µg/L (Round 2). RDX in 55MW-1 was reduced from 2.16 µg/L (Round 1) to a concentration below the LOC (0.22 µg/L - Round 2). Monitoring wells 55MW-3 and 127MW-1, located hydraulically cross-gradient to this AOC also had concentrations of explosives below LOCs. Similarly, the geoprobe samples had explosive concentrations below LOCs. The downgradient extent of explosives in groundwater is limited by Bear Swamp, which represents a local shallow groundwater discharge point.

10.15.2.2 GW AOC2: TCE Contamination at Sites 64 and 131

This AOC is composed of adjacent Sites 64 and 131. Operations at Building 266 (Site 131) and Building 241 (Site 64) used solvents (primarily acetone) to clean parts. Building 240, located adjacent to Site

131, was used as a change house with a laundry, lavatory, and shower facilities which supported operations at Building 241. Because personnel working in the production facilities use the change house, waste wash water may have been contaminated with explosives and cleaning solvents.

Trichloroethene was detected in both wells in Site 64 at concentrations above the LOC of 1 µg/L (**Figure 10-33**). Trichloroethene was detected in monitoring wells 64MW-1 and 64MW-2 at concentrations up to 10 µg/L. Both wells in Site 64 are located adjacent to Building 241 and are completed in the unconsolidated aquifer. Monitoring well 131MW-3 had a TCE concentration of 3.0 µg/L. Monitoring well 131MW-3 is located hydraulically downgradient of Building 241 and Building 266 and was completed in the Leithsville Dolomite; the other two wells located at Site 131 are 131MW-1 and 131MW-2. Monitoring well 131MW-1, completed in the unconsolidated aquifer, contained a TCE concentration of 0.34 µg/L, which is less than the LOC. Monitoring well 131MW-2, completed in the Leithsville Dolomite, did not contain TCE. All four wells containing TCE are located hydraulically cross-gradient of Bear Swamp. The cross-gradient extent of this contamination to the west is Bear Swamp, which is the discharge point for shallow groundwater. Trichloroethene was not detected in the soil, sediment, or surface water samples collected at these sites. However, VOCs were detected in the shallow groundwater at Site 130, which is located hydraulically upgradient of this AOC. Trichloroethene and PCE were detected in one of the three wells at Site 130 at concentrations below the LOC. A review of past activities in and around this area does not point to a definitive source of TCE. As indicated above, several buildings in Area H used solvents to clean equipment parts.

In order to further characterize the extent of this AOC, four hydropunch samples were collected at Site 131 during the Round 2 investigation. Another proposed hydropunch sample (131HP-2) could not be collected because bedrock was encountered at 9 ft bgs prior to the water table. Three of the four samples contained TCE. Sample 131HP-3 had a TCE concentration of 1.60 µg/L. This sample was collected approximately 25 feet downgradient of monitoring well 131MW-3. The most downgradient sample 131HP-1 had a TCE concentration of 0.63 µg/L, which is below the LOC and defines the downgradient extent of this AOC. The upgradient boundary is defined by hydropunch samples 131HP-4 and 131HP-5, which did not contain TCE in excess of the LOC. Monitoring well 131MW-3 is a bedrock well. Thus, the vertical extent of contamination is unknown. The TCE contamination in the bedrock aquifer is believed to be caused by vertical migration of TCE from the overburden aquifer to the bedrock. The thickness of the overburden at Site 131 ranges from 17 to 25 feet. An examination of the vertical gradients between unconsolidated wells and bedrock wells at Site 131 and adjacent Site 129 indicates groundwater from the unconsolidated aquifer flows downward into the bedrock aquifer. Approximately 900 feet downgradient of 131MW-3, a similar AOC has been identified in Area G. The AOC in the southwestern portion of Area G is characterized by TCE and PCE in the shallow overburden aquifer (IT, 2001c). The Mid-Valley groundwater investigation will evaluate the possible interconnection of these two AOCs and address possible sources.

In addition, monitoring well 62MW-1, which is located on the western side of Bear Swamp Brook, cross-gradient of Site 64 contained a low level of TCE. The TCE concentration, which is below the LOC, appears to be an isolated incidence and not related to the contamination in this AOC.

10.15.2.3 GW AOC3: PCE Contamination at Monitoring Well 130MW-1

Methylene chloride and PCE were detected at concentrations in excess of their LOCs in Sample 130MW-1 during the Round 1 investigation. The concentration of methylene chloride is suspect, because it was also found in the associated blank. These two compounds were not detected in the other two groundwater samples or the soil samples collected from this site.

The source of the PCE contamination is believed to be the past explosives pressing operations at Building 252. Wastes generated at Building 252 included waste solvents and wastewater from floor wash down activities. In the past, all wastewater was discharged via a floor trough conveyance system to holding tanks, filtered, and then discharged to Bear Swamp Brook. PCE was detected in a sediment sample collected from Bear Swamp Brook adjacent to Building 252.

In order to confirm the VOC levels identified in monitoring well 130MW-1 in 1996, the well was re-sampled in 2000 for VOCs as part of the Round 2 RI. PCE (0.60 µg/L) and TCE (0.35 µg/L) were detected at concentrations below the LOC of 1 µg/L. Methylene chloride was not detected in the sample.

Contamination at this location appears to be an isolated incident, because PCE was not detected at elevated levels in any other Area H wells. Since groundwater in the unconsolidated aquifer discharges to Bear

Swamp Brook located less than 25 ft from the well, the extent of groundwater contamination would be minimal. PCE was not detected in the other two groundwater samples from Site 130 or the soil samples collected from this site. In addition, the results of the most recent sampling indicate the PCE concentration is below the LOC.

10.15.2.4 GW AOC4: RDX and Manganese Contamination at Monitoring Well 132MW-2

The groundwater sample from monitoring well 132MW-2 contained RDX and manganese at concentrations in excess of their respective LOCs. This well is located at the northeast corner of former Building 271-I. Monitoring well 132MW-1, located in the southwestern portion of the site and hydraulically downgradient of 132MW-2, did not contain an elevated manganese concentration nor was RDX detected in the sample during the Round 2 sampling event (**Figure 10-34**).

Sources of these two compounds can be traced to past operations at Building 271-I. Activities documented to have occurred at the building include primer explosives pressing and loading. Specifically, pneumatic presses were used to press explosive primers (i.e., lead azide, tetryl, RDX, and HMX) into loading cups. Explosives were produced in Building 271-I as well as throughout Site 132 from the early 1940s until 1973. A portion of the building was also used as a magazine for in-process munitions. Off-specification explosives and contaminated wastewater were transported daily to Building 271-I from the surrounding buildings and eventually to the burning grounds for disposal. Explosives contaminated wastewater from floor wash down activities, if any, was likely discharged directly onto the ground outside the doors since Building 271-I did not have a wastewater conveyance system. RDX was identified in 132MW-2 at concentrations of 17.6 µg/L (Round 1) and 7.70 µg/L (Round 2), which exceed the LOC of 0.61 µg/L.

The high level of manganese detected in the groundwater may be related to the storage of manganese dioxide in Building 271-I. Manganese was reported at a concentration of 9,640 µg/L in Sample 132MW-2 (Round 1) and 7,400 µg/L (Round 2). Manganese was detected in downgradient monitoring well MW-3GB at 1,190 µg/L during the Round 1 sampling event.

In order to further characterize the extent of this AOC, four hydropunch samples were collected around well 132MW-2 and analyzed for explosives and metals during the Round 2 RI. 4-Nitrotoluene was the only explosive detected in the samples. The concentration of 0.11 g/L is well below the LOC of 61 g/L. Manganese was reported in all four samples at concentrations above the LOC of 50 µg/L. The manganese concentrations ranged from 280 µg/L to 43,200 µg/L in sample 132HP-3. The elevated manganese levels are due in part to the high turbidity associated with hydropunch samples. However, the similarity of the filtered and unfiltered manganese concentrations detected in 132MW-2 suggest that the manganese is in solution and not associated with suspended solids/particulates in the groundwater.

The RDX and manganese contamination appears to be greatest in the area around Building 271-I. The closest downgradient monitoring well 132MW-1 is located approximately 250 feet southwest. No explosives were detected in this well or the three groundwater samples collected at nearby Site 131. There are no nearby upgradient wells. This AOC does not seem to be associated with the RDX contamination detected in the groundwater in Site 55, located on the opposite side of Bear Swamp Brook.

10.15.2.5 GW AOC5: Metals Contamination Throughout Area H

Other than the manganese exceedances discussed in the previous section, four metals (aluminum, cadmium, iron, and lead) were detected at concentrations greater than their respective LOCs in groundwater samples from Area H. Manganese was also detected above the LOC at other Area H monitoring wells besides Site 132. With the exception of the manganese identified at elevated levels at Site 132, aluminum, iron and manganese are not expected to be related to site activities. These metals are common elements, which are reported at elevated concentrations in groundwater samples throughout Area H and the entire facility. One of these three metals was reported above LOCs in 10 of the 26 monitoring wells in Area H including both overburden and bedrock wells (**Figure 10-31**). The source of these compounds is believed to be weathering of the local geologic materials, which are rich in these elements (Sims, 1958).

Lead was detected above the LOC of 10 µg/L in three wells during the Round 1 sampling event: 128MW-3 (16.5 µg/L), 132MW-1 (18.1 µg/L) and 151MW-1 (25.1 µg/L). Two of these wells were re-sampled and analyzed for lead during the Round 2 investigation. Monitoring well 128MW-3, which was installed as a background well, had a lead concentration less than the LOC. For well 151MW-1, the lead concentration

decreased to 14.0 µg/L, which still exceeds the LOC. Based on the random pattern of exceedances and lack of lead in downgradient monitoring wells, the lead levels should not be considered a concern.

Cadmium was detected in one well (132MW-2) at a concentration of 4.06 µg/L, which slightly exceeds the LOC of 4.0 µg/L. It was not detected in downgradient wells, MW-3GA and MW-3GB.

10.15.3 Groundwater Recommendations

10.15.3.1 GW AOC1: Explosives Contamination of Shallow Groundwater at Site 55

Three monitoring wells and two geoprobe well points were installed at Site 55 and sampled to evaluate the potential for explosives contamination from explosives production and testing conducted at the site since the 1940s. RDX was the only explosive compound detected above LOCs.

The analytical data has delineated the extent of this AOC and indicated the elevated RDX concentrations are limited to one location (55MW-2). Thus, institutional controls (i.e., establishment of a CEA) are recommended for Site 55 groundwater.

10.15.3.2 GW AOC 2: TCE Contamination at Sites 64 and 131

Five monitoring wells and six hydropunch well points were installed at Sites 64 and 131 to characterize the nature and extent of groundwater contamination in the southern portion of Area H. TCE was reported above the LOC of 1.0 µg/L at five locations. It was detected below the LOC in three other samples.

Since additional investigation of this AOC is being performed as part of the Mid-Valley Groundwater RI, a recommendation for this AOC will be presented in the RI report for that investigation.

10.15.3.3 GW AOC 3: PCE Contamination at Monitoring Well 130MW-1

Due to its proximity to Bear Swamp Brook and the artesian groundwater conditions at Site 130, the migration of the PCE contamination at 130MW-1 is severely restricted. The most recent analytical data for 130MW-1 indicated PCE was below the LOC. Thus, this should no longer be considered an AOC and no further action is required.

10.15.3.4 GW AOC 4: RDX and Manganese Contamination at Monitoring Well 132MW-2

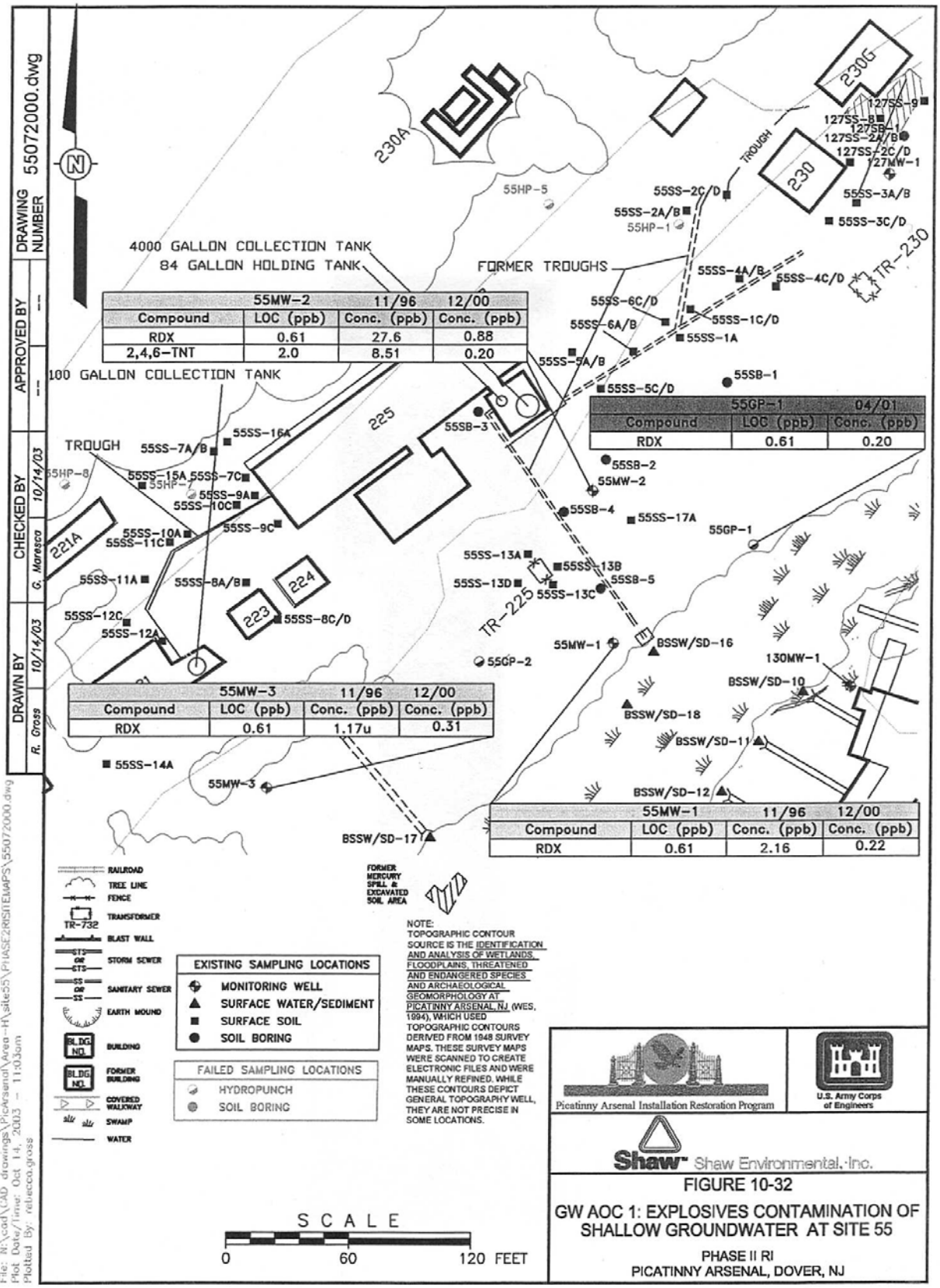
Two monitoring wells and four hydropunch well points were installed and sampled at Site 132 to characterize the nature and extent of groundwater contamination at this former explosives pressing and loading facility. RDX , cadmium, lead, and manganese were detected in the groundwater at concentrations in excess of LOCs. With the exception of manganese, these exceedances were only detected at one location. Manganese was reported above the LOC at five of the six locations.

Based on the analytical results of the groundwater samples from Site 132 as well as LOC exceedances reported in groundwater samples from Site 55 (GW AOC 1) and Sites 64 and 131 (GW AOC 2, institutional controls (i.e., establishment of a CEA) will be required for Area H groundwater, which has been identified as PICA Site 204. Additional recommendations may be proposed for Area H groundwater pending the conclusion of the Mid-Valley Groundwater RI.

10.15.3.5 GW AOC5: Metals Contamination Througout Area H

With the exception of the manganese contamination discussed in the previous section, lead and cadmium are the only metals detected in groundwater above the LOC that may be related to site activities. However, analysis of soil samples collected at these sites did not identify elevated levels of lead and cadmium at these sites. Evaluation of groundwater data from the nearest downgradient monitoring well from Site 132, MW-3GA, did not indicate any cadmium in the sample. Monitoring well MW-3GA is located approximately 500 feet downgradient of monitoring well 132MW-2. Lead was not detected in bedrock wells 100MW-1 and 151MW-2, located approximately 140 feet and 480 feet downgradient of well 151MW-1.

The soil data and downgradient well data suggest that the cadmium and lead exceedances reported at Sites 132 and 151 are isolated incidences. Therefore, institutional controls are recommended for the groundwater contamination.



55MW-2	11/96	12/00
Compound	LOC (ppb)	Conc. (ppb)	Conc. (ppb)
RDX	0.61	27.6	0.88
2,4,6-TNT	2.0	8.51	0.20

55GP-1	04/01
Compound	LOC (ppb)	Conc. (ppb)
RDX	0.61	0.20

55MW-3	11/96	12/00
Compound	LOC (ppb)	Conc. (ppb)	Conc. (ppb)
RDX	0.61	1.17u	0.31

55MW-1	11/96	12/00
Compound	LOC (ppb)	Conc. (ppb)	Conc. (ppb)
RDX	0.61	2.16	0.22

FIGURE 10-32

GW AOC 1: EXPLOSIVES CONTAMINATION OF SHALLOW GROUNDWATER AT SITE 55

PHASE II RI
PICATINNY ARSENAL, DOVER, NJ

XREF Files: IMAGE Files: ocelogo.jpg picklogo3.tif
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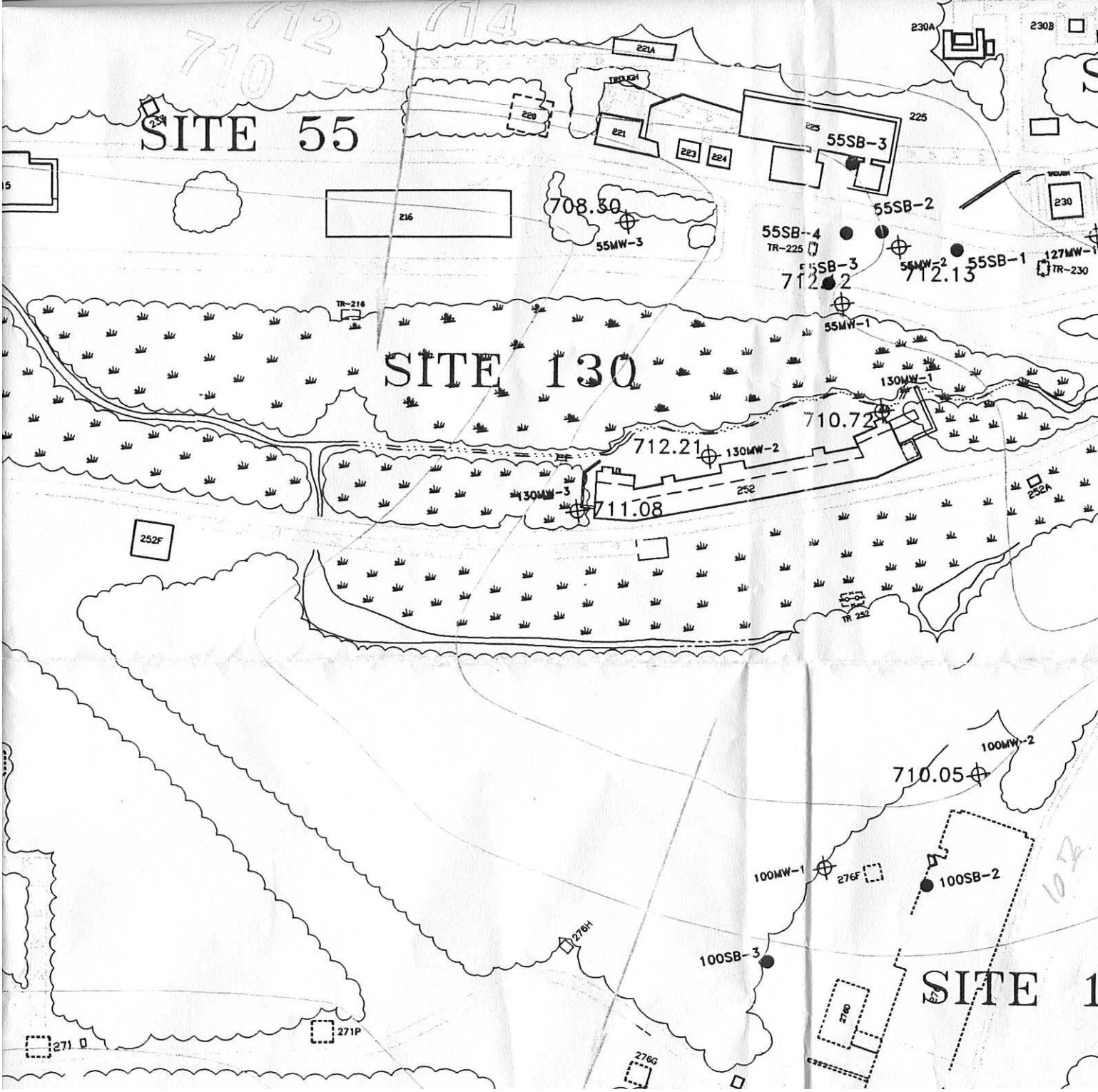
Plot Date/Time: Oct 14, 2003 - 11:03am
Plotted By: rebecca.gross


SITE 55
SITE 130
SITE 1
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712
714
230A
230B
221A
TROUGH
220
221
223
224
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55SB-3
55SB-2
55SB-4
TR-225
55SB-1
127MW-1
TR-230
230
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55MW-2
712.13
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252
252A
252F
TR 252
100MW-2
710.05
100MW-1
276F
100SB-2
276H
100SB-3
276
271
271P
276G

ATTACHMENT W

Not Used

ATTACHMENT X

Welcome to Hysterusa.com, home of more than 130 of the biggest, baddest lift trucks on the planet, all gathered in one place. That means Hyster Company has a durable, productive solution no matter how challenging the environment you're working in. And our network of experienced dealers has the brains to back up our brawn, to help you maximize your equipment utilization.

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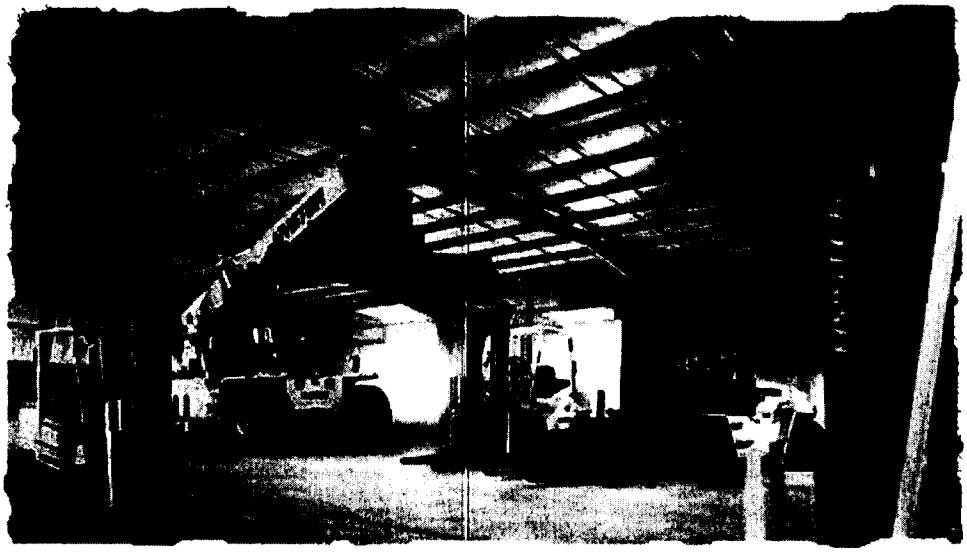

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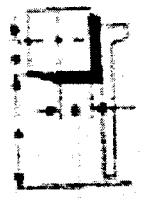
Read Operating Manual located on or near seat.

to follow operating, and maintenance may cause serious or death!

ELECTRIC LIFT TRUCK MODEL

Serial no.

Attachment	FR	RR
Tire size	FR	RR
pressure		
Battery type		
Battery voltage	Amp hour capacity	
Battery weight min	lb	**CAPACITY WITH MAST VERTICAL AND EQUIPPED**
max	lb	**AS SHOWN**
		Load height 'A' in
Truck weight	lb	Maximum load at load center 'B'
with max battery	lb	lb in
without battery	degrees	lb in
Back tilt	in	lb in
Drive tread width		

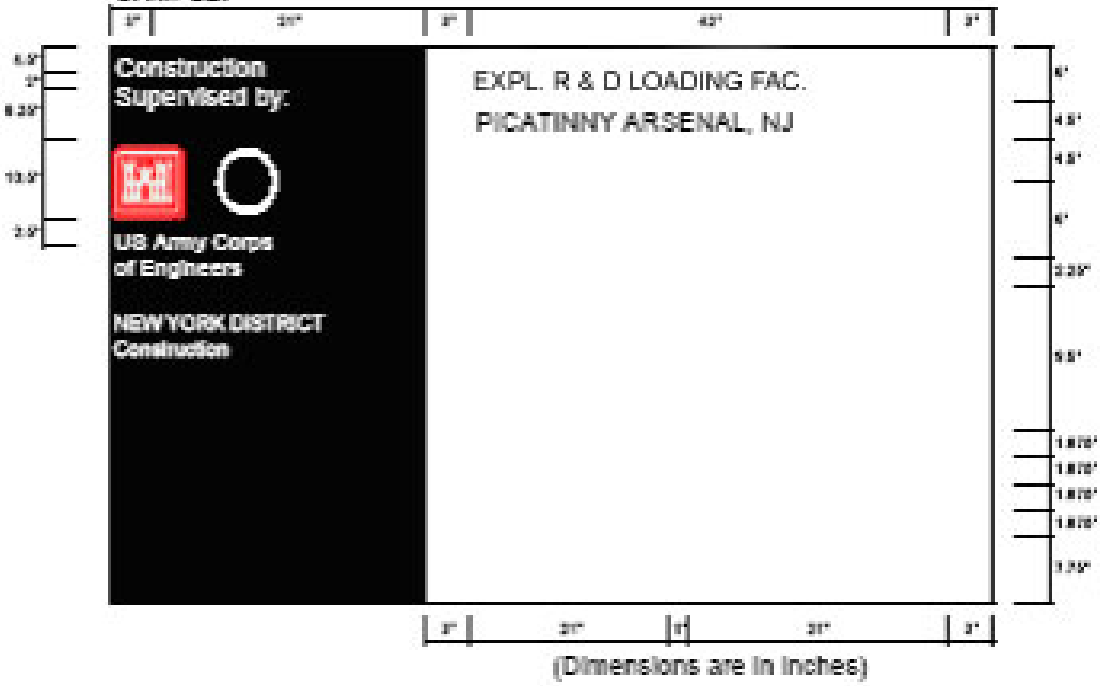


ATTACHMENT Y

PROJECT IDENTIFICATION SIGN
MILITARY PROJECT

The graphic format for this 4' x 6' sign panel follows the legend guidelines and layout as specified below. The large 4' x 4' section of the panel in the right is to be white with black legend. The 2' x 4' section of the sign on the left with the full corps Signature (reverse version) is to be screen printed Communications Red on the white background. The castle insignia will be furnished by the Government in pressure sensitive vinyl for affixing by the Contractor.
See attached sheet for fabrication and mounting guidelines.

SAMPLE:



Sign Type	Legend	Panel Size	Post Size	Specification Code	Mounting Height	Color Bkgd/Lgd
CID-01	Various	4' x 6'	4" x 4"	H20-3	48"	WH-RD/BK

Legend Group 1:
One to two-line description of Corps relationship to project
Color: white
Typeface: 1.25" Helvetica Regular
Maximum line length: 19"

Legend Group 2:

Division or District Name (optional, Place below 10.5" Reverse Signature (6" Castle)
Color: white
Typeface: 1.25" Helvetica Regular.

Legend Group 3:
One-to three-line project title legend describes the work being done under this contract.
Color: Black
Typeface: 3" Helvetica Bold
Maximum line length: 42"

Legend Group 4:
One-to two-line identification of project or facility(civill works) or name of sponsor in department(military).
Color: Black
Typeface: 1.5" Helvetica Regular
Maximum line length: 42"

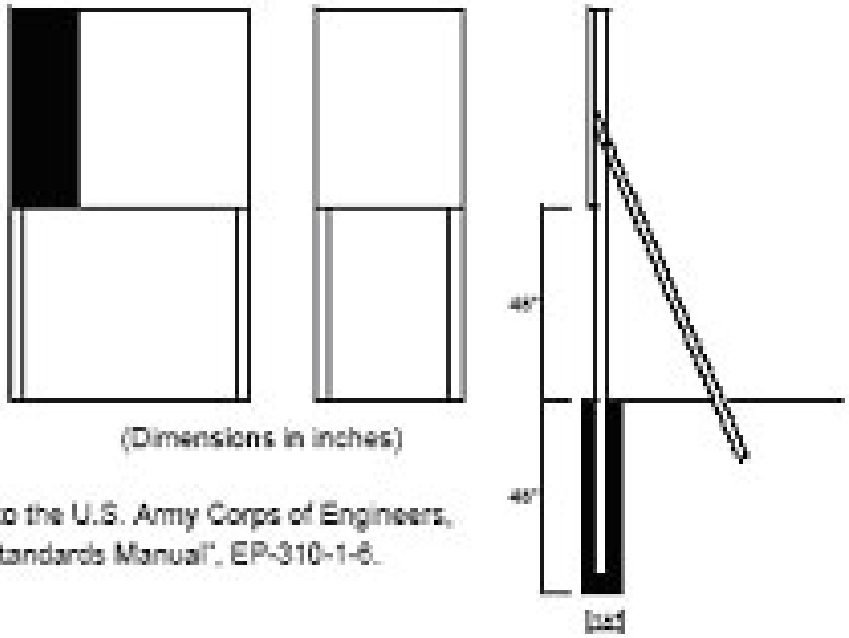
Sign Type	Legend	Panel Size	Post Size	Specification Code	Mounting Height	Color Bkg/Lgd
CID-01	various	4'x6'	4'x4'	HDO-3	48"	WH-RD/BK

Cross-align the first of Legend Group 4 with the first line of the Corps Signature (US Army Corps) as shown.

Legend Group 5a-b:
One-to-five line identification of prime contractors including: type architect, general contractor, etc.), corporate or firm name, city, state.

Use of Legend Group 5 is optional.
Color: Black
Typeface: 1.25" Helvetica Regular
Maximum line length: 21"

All typography is flush left and rag right upper and lower case with initial capitals only as shown.
Letter and word spacing to follow
Corps standards as specified in U.S. Army Corps of Engineers, "Sign Standards Manual", EPS-310-1-6.



(Dimensions in inches)

** Refers to the U.S. Army Corps of Engineers, "Sign Standards Manual", EP-310-1-6.

Construction Project Sign
Legend Group 1: Corps Relationship

1.
2.

Legend Group 2: Division/District Name

1.
2.

Legend Group 3: Project Title

1.
2.
3.

Legend Group 4: Facility Name

1.
2.

Legend Group 5a: Contractor/A&E

1.
2.
3.
4.
5.

Legend Group 5b: Contractor/A&E

1.
2.
3.
4.
5.

Safety Performance Sign
Legend Group 1: Project Title

1.
2.

Legend Group 2: Contractor/A&E

1.
2.

Fabrication and Mounting Guidelines

As Construction Project Identification signs and Safety Performance signs are to be fabricated and installed as described below. The signs are to be erected at a location designated by the contracting officer and shall conform to the size, format, and typographic standards shown on the attached sheets.

The sign panels are to be fabricated from .75" High Density Overlay Plywood. Panel preparation to follow HDD specifications provided in Appendix B**

Sign graphics to be prepared on a white non-reflective vinyl film with positionable adhesive backing.

All graphics except for the Communications Red background with Corps signature on the project sign are to be die-cut or computer-cut non-reflective vinyl, pre-spaced legends prepared in the sizes and typefaces specified and applied to the background panel following the graphic formats shown on the attached sheets.

The 2'x4' Communications Red panel (to match PMS-032) with full Corps signature (reverse version) is to be screen printed on the white background. Identification of the District or Division may be applied under the signature with white cut vinyl letters prepared to Corps standards. Large scale reproduction artwork for the signature is provided on page ?? photographically enlarge from 6.875" to 10.5").**

Drill and Insert six (6) .375" T-nuts from the front face of the HDD sign panel. Position holes as shown. Flange of T-nut to be flush with sign face.

Apply graphic panel to prepared HDD plywood panel following manufacturers' instructions.

Sign uprights to be structural grade 4"x4" treated Douglas Fir or Southern Yellow Pine. No.1 or better. Post to be 12" long. Drill six (6) .375" mounting holes in uprights to align with T-nuts in sign panel. Countersink (.5") back of hole to accept socket head cap screw (4"x.375").

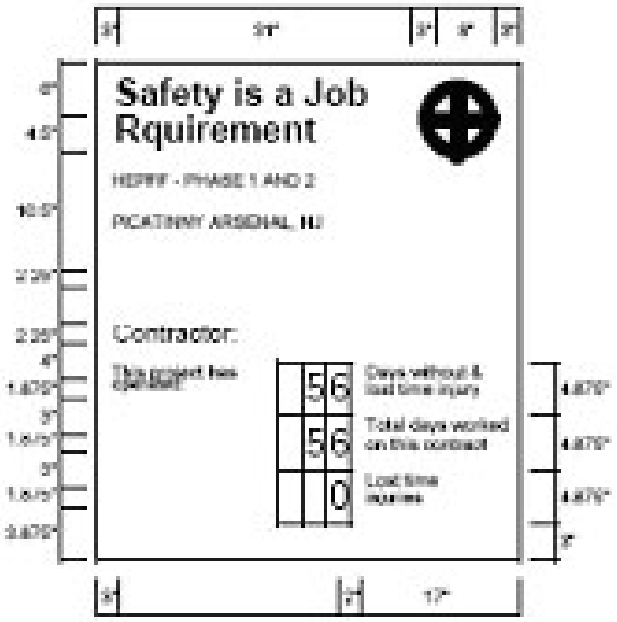
Assemble sign panel and uprights. Imbed assembled sign panel and uprights in 4" hole. Local soil conditions and/or wind loading may require bolting additional 2"x4" struts on inside face of uprights to reinforce installation as shown.

Detailed specifications for HDD plywood panel preparation are pro-vided in U.S. Army Corps of Engineers, "Sign Standards Manual", EP-310-1-6.

Shown below the mounting diagram is a panel layout grid with spaces provided for project information. Photocopy this page and use as a worksheet when pre-apring sign legend orders.

SAFETY PERFORMANCE SIGN

The graphic format, color, size and type-faces used on the sign are to be reproduced exactly as specified below. The title with First Aid logo in the top section of the sign, and the performance record captions are standard for all signs of this type. Legend Group 2 and 3 below identify the project and the contractor and are to be placed on the sign as shown. Safety record numbers are mounted on individual metal plates and are screw-mounted to the background to allow for daily revisions to posted safety performance record.

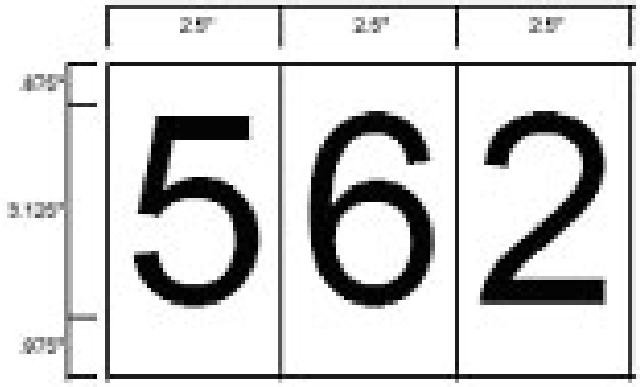


Dimensions inches.
See attached sheet for fabrication and mounting guidelines.

EXAMPLE

For full graphic details consult the U.S. Army Corps of Engineers, "Sign Standards Manual", EP-310-1-6.

Sign Type	Legend Size	Panel Size	Post Size	Specifications Code	Mounting Height	Color Bkgd/Lgd
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]



Legend Group1:
Standard two-line title “Safety is a Job Requirement” with (8" od.)Safety Green First Aid logo.
Color: To match PMS 347
Typeface: 3" Helvetica Bold
Color: Black

Legend Group 2:
One- to two-line project title legend describes the work being done under this contract and name of host project.
Color: Black
Typeface: 1.5" Helvetica Regular
Maximum line length: 42"

Legend Group 3:
One - to two-line identification: name of prime contractor and city, state address.
Color: Black 3
"Typeface: 1.5" Helvetica Regular
Maximum line length: 42"
Legend Group 4: Standard safety record captions as shown.
Color: Black
Typeface: 1.25" Helvetica Regular

Replaceable numbers are to be mounted on white .060: aluminum plates and screw-mounted to background.
Color: Black Dimensions inches.
Typeface: 3" Helvetica Regular
Plate size: 2.5"x.5"

All typography is flush left and rag right, upper and lower case with initial capitals only as shown.

Letter-and word-spacing to follow Corps standards as specified in U.S. Army Corps of Engineers, "Sign Standards Manual", EPS-310-1-6.

Sign Type	Legend Size	Panel Size	Post Size	Specifications Code	Mounting Height	Color Bkg/Lgd
CID-02	various	4"x4"	4"x4"	HDO-3	48"	WH/BK-GR

ATTACHMENT Z

NOT USED