AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE	PAGE OF PAGES	
J	1	5

2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO.(If applicable)
0001	03-Jun-2003	W26GLG-3008-5156	

6. ISSUED BY	CODE	7. ADMINISTERED BY (If other than item 6)	CODE
CONTRACTING OFFICE (CA/CW) US ARMY ENGR DIST NORFOLK ATTN: CENAO-SS-C 803 FRONT STREET NORFOLK VA 23510-1096	DACA65	**See Item 6**	

8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code)			
		X	9A. AMENDMENT OF SOLICITATION NO. DACA65-03-R-0014
		X	9B. DATED (SEE ITEM 11) 12-Mar-2003
			10A. MOD. OF CONTRACT/ORDER NO.
			10B. DATED (SEE ITEM 13)
CODE	FACILITY CODE		

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.)

Subject Request for Proposal for FIRE AND EMERGENCY SERVICES CENTER, FORT LEE, VA, is hereby amended as follows:

1. Due Date for submittal of proposals for Phase 2 is TUESDAY, JULY 15, 2003 AT 2:00 PM.
2. SECTION 00010: Bid Schedule is added as shown on the attached.

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 03-Jun-2003

SECTION SF 30 BLOCK 14 CONTINUATION PAGE

The following items are applicable to this modification:

CONTINUATION

3. Proposals are due in the Norfolk District, Corps of Engineers, 803 Front Street, Norfolk, VA 23510-1096, ATTN: Contracting Office.

4. Plans and specifications are added as shown on attached.

SECTION 00100 - BIDDING SCHEDULE/INSTRUCTIONS TO BIDDERS
BIDDING SCHEDULE

Section 00010 Solicitation Contract Form

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0001	All design and construction work within the 5' line (includes all work inside of a line drawn at a perpendicular distance of five feet outside of the exterior face of foundation walls), complete, including all work incidental thereto as shown on the drawings and as specified, exclusive of items 0002-0006, and Schedule II-Optional Bid Items.	1	Lump Sum	_____	
0002	All design and construction work on outside of the five-foot line excluding items 0001, 0003-0006, and Schedule II – Optional Bid Items	1	Lump Sum	_____	
0003	All costs in connection with bituminous pavement complete, including compacted subgrade, aggregate base course, and all work incidental thereto as shown on the drawings and specified. Pavement _____sq. yd @ $_____per sq. yd., excluding items 0001-0002, 0004-0006, and Schedule II – Optional Bid Items.	1	Lump Sum	_____	
0004	All costs in connection with As-Built Drawings as specified from preparation to final, complete, including all work incidental thereto as shown on the drawings and as specified, exclusive of items 0001-0003, and 0005-0006, and Schedule II- Optional Bid Items.	1	Lump Sum	1_____	$25,000
0005	All work for O&M Manuals as specified from preparation to final, complete, including all work incidental thereto as shown on the drawings and as specified, exclusive of items	1 Job	Lump Sum	_____1__	$60,000

0001-0004, 0006, and Schedule II- Optional Bid Items.

1 Job Lump Sum _____1_
$12,000

0006 All work for Form 1354 Checklist and Equipment in Place List as specified from preparation to final, complete, including all work incidental thereto as shown on the drawings and as specified, exclusive of items 0001-0005 and Schedule II – Optional Bid Items.

BASE BID ITEMS SCHEDULE I – TOTAL BASE BID
_____

OPTIONAL BID ITEMS

0007 1 Lump Sum _____
_____
All costs in connection with Bid Option Item 1 for Emergency Generator, complete, including all work incidental thereto as shown on the drawings and as specified, exclusive of Schedule I – Base Bid Items.

SCHEDULE II – TOTAL OPTIONAL BID ITEMS _____

TOTAL SCHEDULE I + SCHEDULE II BID ITEMS _____

3. NOTES.

a. The Army will procure this work through a negotiated cost in accordance with the provisions set forth in this Request for Proposals (RFP). When a contract is awarded, it will be a design-build "Firm Fixed Price Contract".

b. Submission of desirable betterments exceeding minimum requirements may be considered as long as award can be made within the established funds.

c. Any proposal which is materially unbalanced as to prices for the Base Schedule may be rejected. An unbalanced proposal is one which is based on prices significantly less than the cost for some work and prices which are significantly overstated for other work and can also exist where only overpricing or underpricing exists. A proposal may be rejected if the Contracting Officer determines that the lack of balance poses an unacceptable risk to the Government.

d. Failure to insert prices for each item in the Base Schedule and each item in the Optional Bid Schedule may cause the proposal to be rejected.

e. The Offeror agrees if he or she is awarded a contract under this RFP, which includes any optional items, that the Government reserves the right to reinstate any optional item(s) into the contract at any time up to 90 calendar days after notice to proceed, provided that such reinstatement would not alter the original determination of the successful Offeror. If an optional item is reinstated in the contract, it is also agreed that the reinstated price will be the same as the schedule price.

f. Budget amounts are provided for items 0004, 0005, 0006.

g. The Total Base Bid including any betterments (but excluding Optional Bid Item 0007) shall not exceed the established funds available for award of $4,550,000.

US Army Corps
of Engineers®

Fire & Emergency Services Center (FESC) Phase 1

Fort Lee, Virginia

Project Number 58724

REQUEST FOR PROPOSAL (RFP)

27 May, 2003

U.S. ARMY CORPS OF ENGINEERS
Norfolk District

Fire & Emergency Service Center
Phase 1
Ft Lee, Virginia

STATEMENT OF WORK

27 May 2003

U.S. ARMY CORPS OF ENGINEERS (Norfolk District)

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CHAPTER 1

DESIGN OBJECTIVES

1-1 SCOPE OF WORK. Design and construction shall comply with the specifications and requirements contained in this Request for Proposals (RFP). The design and technical criteria contained and cited in this RFP establish minimum standards for design and construction quality. The objective of this solicitation is to obtain a fully functional facility. This contract shall consist of the design and construction of a 13,325 square foot facility. The building shall be completely finished and include casework, building equipment, accessories, heating, cooling, lighting, power, communications, and fire protection. Supporting facilities include utility connections, electric service, exterior lighting, fire protection and alarm systems, paving, walks, curbs and gutters, parking, storm drainage, information systems, anti-terrorism/ force protection measures, sustainable design and development concepts, traffic control system and site improvements on Government-owned land at Fort Lee, Virginia. The site is located on the corner of *5th Street* and Adams Avenue. Access for the handicapped shall be provided.

Phase 2 requirements are included for coordination. The RFP requires certain infrastructure be provided in Phase 1 that will support Phase 2. While the RFP does not require construction of Phase 2 site improvements or spaces to meet the requirements of the project, the Offeror may include all or portions of Phase 2 in his/her proposal as a betterment. Any betterment must be clearly defined.

1-1.1 **Site Area**. The site is described the civil portion of the RFP and includes approximately *7.5* acres plus off site utility work.

1-1.2 **Site Work**. Site work includes all design and construction of site features described in the RFP, including but not limited to, site planning, clearing, grading, erosion control, site drainage, utility systems, pavements, pedestrian and vehicular circulation systems, screening, landscaping, physical security measures, traffic controls and site furnishings.

1-1.3 **Special Utilities and Supplementary Construction**. None required.

1-1.4 **Demolition Considerations and Requirements**. Refer to the existing site survey and proposed site layout plan. Demolition shall include vegetation, pavement, removal of buried debris from previous construction, and utilities as required to accomplish the work. Demolition materials shall be disposed off Government property. The contractor shall obtain demolition and disposal permits from appropriate agency. Obtain approval of the disposal site from the contracting officer.

1-1.5 **Environmental Considerations and Mitigation Requirements**. Site is category code 2. There is no known contamination but there remains some potential that contamination may be encountered during construction.

1-2 APPLICABLE CRITERIA. Applicable design and construction criteria references are listed in Appendix A to the Statement of Work. Criteria shall be taken from the most current references as of the date of issue of the RFP. Referenced codes and standards are minimum acceptable criteria. Administrative, contractual, and procedural features of the contract shall be as described in other sections of the RFP.

Specifically, UFC 1-200-01 Design: General Building Requirements shall be used with the International Building Code. UFC 3-600-01 Design: Protection Engineering For Facilities shall be used relative to fire protection. Combustible materials shall not be used in the building except as permitted by the code for miscellaneous items.

1-3 DESIGN QUALITY. The main objectives of this solicitation are to obtain a building including support facilities and associated site development within funds available, and to maximize design quality. Design quality is achieved through the optimization of interior and exterior planning, sustainability, selection of building systems for low-cost maintenance and operation, and an overall balance of aesthetics and functionality.

1-4 DESIGN FREEDOM. Requirements stated in this RFP are minimums. A partial design including floor plans, elevations, sections and site plans are included in the RFP and are mandatory but may be modified slightly to accommodate construction requirements. Multi-level or solutions utilizing a basement or second floor are unacceptable. The design provided is to assure functionality and design image desired by the user of the building as well as Fort Lee. The Offeror may provide as a betterment additional construction to include portions or all of Phase 2. Any betterment must be clearly stated and defined as a betterment.

1-5 ENERGY AND RESOURCES CONSERVING FEATURES. Public Law 102-486, Executive Order 12902, and Federal Regulations 10 CFR 435, require federal buildings to be designed and constructed to reduce energy consumption in a life cycle, cost-effective manner using renewable energy sources when economical. Products designed to conserve energy and resources by controlling the amounts of consumed energy or by operating at increased efficiencies should be considered. Minimum requirements for this project are listed in the Statement of Work.

1-6 INSTALLATION REAL PROPERTY MASTER PLAN. Not Applicable.

1-7 INSTALLATION DESIGN GUIDE. RFP of this project has incorporated design guidance and criteria from the Fort Lee Installation Design Guide (IDG). The IDG, included as an attachment, shall be used for additional guidance unless noted otherwise in the RFP.

1-8 ACCESSIBILITY REQUIREMENTS. All areas of facility that are required to be accessible to physically disabled persons shall conform to the Uniform Federal Accessibility Standards (UFAS) Federal Standard 795, and the Americans With Disabilities Act Accessibility Guidelines (ADAAG). The following areas shall be accessible: All areas except service areas such as the mechanical, electrical, janitor rooms, and whirlpool.

1-9 FORCE PROTECTION & ANTI-TERRORISM CONSIDERATIONS. Project site and building design and construction shall comply with Anti-Terrorism / Force Protection Criteria is identified in various technical requirements of this RFP and as required by the AT/FP criteria attached to this RFP. The Ft Lee required protection level is “low” with a “controlled perimeter” provided by the installation fence. “Stand-off distances” at <u>emergency vehicle driveways</u> only shall be achieved shall be achieved with the use of permanent signage. The Apparatus Bays shall be considered “un-inhabited”. Other portions of the building are considered a “primary gathering facility”. Use of maximum standoff is encouraged to meet ATFP requirements.

1-10 ORGANIZATIONAL STRUCTURE. The site is specifically organized to allow proper flow of emergency vehicles in and out of the site and also considers future phases of construction. The building is organized to separate specific administrative, maintenance, storage, and sleeping areas.

CHAPTER 2

FUNCTIONAL AND AREA REQUIREMENTS

2-1 GENERAL REQUIREMENTS

2-1.1 **Gross building area definition**. Gross building area is measured to the outside face of exterior enclosure walls. Gross area includes floor areas, penthouses, mezzanines, and other enclosed spaces.

2-1.1.1 **Areas calculated as half space**. Gross area includes one-half the area of exterior covered areas such as balconies, entries, breezeways, exterior corridors, and porches. Exterior covered areas are measured from the face of the enclosure wall to the edge of the covered area served. Stairs (enclosed or open) count as half space for each floor they serve.

2-1.1.2 **Excluded space**. The following spaces are excluded from gross area calculations: Floored attic areas where average clear height does not exceed 7 feet; crawl spaces; exterior uncovered loading platforms; open courtyards; normal roof overhangs and soffits for weather protection; uncovered ramps and steps; utility tunnels; raceways; mechanical equipment platforms and catwalks.

2-1.2 **Gross area limitations**. The gross area of this project (Phase 1) is approximately 13,325 square feet as approved and provided for in the design. The plan may be modified to accommodate construction preferences of the Contractor while still meeting other requirements of the RFP.

Phase 2 requirements are included for coordination. The RFP requires certain infrastructure be provided in Phase 1 that will support Phase 2. While the RFP does not require construction of Phase 2 site improvements or spaces to meet the requirements of the project, the Offeror may include all or portions of Phase 2 in his/her proposal as a betterment. Any betterment must be clearly defined.

2-1.3 **Net area definition**. Net area is measured to the inside face of the room or space walls.

2-1.4 **Net Area Requirements**. Net area requirements for programmed spaces are indicated by the floor plan. Net areas may be reduced up to 5% in larger rooms to accommodate structural and mechanical requirements in the final design, if all other requirements of the RFP are met.

2-1.5 **Ceiling Heights**. Ceiling heights are identified in the Finish Schedule.

2-1.6 **Functionality**. Rooms are sized and arranged for efficient use, circulation, and furniture placement. Modifications to rooms must be approved during the design phase by the Contracting Officer. Occupancy loads for egress and mechanical design shall be determined from the Furniture Plan. Maximum occupancy shall provide for a person in each seat shown on the Furniture Plan as well as occupancy as required by code for service areas simultaneously.

2-1.7 **Finish Requirements**. Room finishes are indicated in the finish schedule. Finishes are minimums and better finishes may be offered.

2-1.8 **Furniture Requirements**. Furniture shall be Government Furnished, Government Installed (GFGI). A furniture layout has been provided in the RFP for coordination with design work such as placement of electrical and mechanical items.

2-2 FACILITY FUNCTIONAL SPACE REQUIREMENTS. The facility shall consist of the spaces indicated below and as shown on the accompanying drawings. The floor plans clarify the functional relationships and space sizes. Building spaces and areas are described as follows:

Phase I

Rm # Room Name

100 Apparatus Bays
Apparatus Bays shall have floors with non-slip chemical resistant type epoxy coating over concrete that is reinforced to support storage of emergency vehicles. Provide Bays with clear spans(no structural columns other than the perimeter of this space, see RFP drawings).Provide an attached vehicle exhaust removal system with attachment for two vehicles per bay. Floors are to slope to a trench drain, one per bay. Provide a bay outline with a 4” epoxy paint stripe for each bay. Convenience electrical power for each bay to be provided by an overhead access point located two points per bay each with a 120-volt, 20 ampere power cord reel. Each cord reel shall be connected to a separate 20 ampere branch circuit. Water and Compressed Air to have one overhead access point per bay. Doors for each bay will be hydraulic 4 folding type with a master control for all the doors mounted on each sidewall of Apparatus Bay area. Each door will have traffic signal style red/green lights for indicating closed/fully open status inside and out mounted in clear view of the vehicle cab. Each Bay will have doors on each end that are operable remotely from cab of the apparatus stored in that bay with a remote access control. Wall mounted hardwired door controls shall also be provided for each apparatus bay door at locations as indicated on the floor plans. Doors to be anodized Bronze to match Installation design criteria. Storage rack with coat hook and shelve for (10) sets of Firefighter turnout gear to be wall mounted on one wall of area. Mount an emergency wash down sink on sidewall and provide an Emergency Shower area. Phase I Apparatus Bays to be heated and cooled.
Communications: Provide telephone /data outlets as indicated.

Partitions: Interior walls shall be painted concrete masonry units, rated as required by code.

Types of Vehicles to be stored:
Pierce Ladder truck approximately 38’ long.
Ambulance Emergency Vehicle
Fire Engine, Pumper (consider fully loaded)
Other misc. equipment

101 Medical Storage
Walls on 3 sides shall be covered with 16” deep adjustable shelves starting at 1’ AFF extending to 7’ AFF with shelves 16” O.C. vertically. Reinforce walls as required to carry shelves with 30# per linear foot of shelf.

102 Fire Extinguisher Maintenance
Walls on two perpendicular sides are to be built in casework countertop and splashblock with a plastic laminate top (a single drawer and cabinets below configuration). Provide a workbench as a center island in the space with a heavy duty vice and with power access for a grinder and receptacle multi-outlet assembly. Provide compressed air to a station built in the casework. Provide one 24” wide space in case work for a built in spare parts bin (shall tip or slide for easy access). Provide a storage area for fire extinguishers. Provide a freestanding emergency eyewash station and janitors wall mounted sink on the open wall. Provide fire extinguisher in a wall cabinet.
Communications: Provide telephone/data outlets as indicated.

103 SCBA Maintenance

Walls on two perpendicular sides are to have built in stainless steel countertops with backsplash One wall to have two open shelves below(no cabnets), on the other provide single drawer and cabinets below configuration. One 12" wide section of the cabinet configuration side shall include a minimum of (six) drawers for small part storage. Provide a workbench as a center island; provide power access for multi-outlet assembly at the workbench for use of numerous small tools. On the open wall provide a premanufacutured industry standard storage rack for (30) SCBA tanks. Remaining open wall to be filled with 16" deep adjustable shelves starting at 1'AFF extending to 7' AFF with shelves 16"O.C. vertically. Reinforce walls as required to carry shelves with 30# per linear foot of shelf. Provide fire extinguisher in a wall cabinet.
Communications: Provide telephone/data outlets as indicated.

104 Electrical Room

Provide spare 4" PVC conduit below slab from floor adjacent to open wall area to 5' beyond the building perimeter for future cables. Arrange equipment in room to allow equipment removal and maintenance. Electrical service to the building shall be underground. Walls shall be reinforced as necessary to carry equipment and conduit.
Partitions: Perimeter partitions shall have 3" acoustic batt insulation from floor to above the ceiling for a STC rating of approximately 51. Electrical room shall be 1 hour rated.
Provide two 120 volt duplex power receptacles for radio transceiver and a 2" conduit with pull rope from radio transceiver location to antenna tower location.
Provide telephone/data outlets as indicated.

Electrical equipment/mechanical equipment area, see equipment screen below.

105 Fire & Emergency Services Storage

Provide fire extinguisher in a wall cabinet.
Communications: Provide telephone/data outlets as indicated.
Provide power connections for Bauer breathing air compressor, Mod. # ME-1, Ser. # 0000002, 7.5 hp , 240v 1 phase and Bauer CO monitor, model BCI 27184, model type MNR-1.

106 Mechanical Room

Provide dedicated interior space and exterior area for plumbing, fire protection, and HVAC equipment. Plan room to allow equipment removal and maintenance. Provide floor openings and vertical shaft spaces as necessary. All equipment shall be placed on concrete house keeping pads. Locate exterior mechanical equipment and air intake and openings in exterior walls to comply with force protection standards. Provide all requirements for Energy Management Control System in coordination with the base wide system. Provide data outlet at EMCS panel and second telephone/data outlet for future use. Provide air compressor, associated piping and electrical connection for compressed air distribution system.

Partitions: Perimeter partitions shall have 3" acoustic batt insulation from floor to above the ceiling for a STC rating of approximately 51. The space shall be 1 hour rated.

107 Corridor 1

108 Vestibule

Exterior doors shall be insulated glass with laminated glass on interior face. Interior doors may be tempered glass in vision lites.

109 Corridor 4

110 Laundry

Laundry shall provide for residential washer and dryer. Dryer shall be vented to the exterior.

Equipment	Finish	Model No.
Elec. Washer	White	Maytag MAH6500AWW or equal
Elec. Dryer	White	Maytag MDE7758AYW or equal

See chapter 5 for equipment descriptions.

111 Kitchen

Provide commercial type kitchen fixtures and equipment unless otherwise noted. Provide 2 gas range/oven units, 2 refrigerators-1 freezer, 1 icemaker, 1 under counter dishwasher, and 1 microwave oven, and a polished stainless steel triple sink with garbage disposal. Provide stainless steel ventilation hood(s) with fire suppression system for range units. Provide stainless steel countertops and base cabinets. Provide wood casework above all counters(see RFP drawings) with locking wall cabinets mounted to provide 2 feet clearance between countertop and bottom of wall cabinets. One ss base cabinet shall include a minimum of (six) 12” wide drawers. Cabinet doors shall have locks. Provide shelf for microwave oven mounted under wall cabinets. Provide individual hand clean sink located separate from kitchen counter. Provide fire extinguisher in a wall cabinet. Room exhaust shall be provided as well as air conditioning. Provide power receptacles above the countertop for heavy-duty coffee pots, toasters, and appliances. Provide outlet boxes on exterior wall adjacent to the kitchen for natural gas and electricity to be used for outdoor cooking. Provide heavy-duty pass thru with roll down Fire Shutter of powder coat finish metal that shall be located at wall that connects the Kitchen and the Dining Room. Locate so as to be used in conjunction with kitchen counter and not conflict with back splash. Shutter to be fully conceald in wall when up and in the open position. Pass thru and ledge to be UL rated. Comply with applicable code requirements for kitchens.

Equipment	Finish	Model No.
Vulcan Gas Range/Oven(2)	SS	Vulcan VG36 or equal
Continental Refrigerator Freezer	SS	Cont. 3RRFor equal
Ice Maker	SS	Manitowoc QM-45A or equal
Dishwasher(under counter type)	SS	Jet Tech F-18DP or equal
Microwave	SS	Sharp R-22GT 1200 Watts or equal

See chapter 5 for equipment descriptions.

112 Dining Room

Communications: Provide cable TV receptacle. Provide telephone/data outlets as indicated.
Partitions: Perimeter partitions shall have 3” acoustic batt insulation from floor to above the ceiling for a STC rating of approximately 51.

113 Lounge

Communications: Provide 2 cable TV receptacles. Provide telephone/data outlets as indicated.
Partitions: Perimeter partitions shall have 3” acoustic batt insulation from floor to above the ceiling for a STC rating of approximately 51.

114 Storage

Provide 16” deep adjustable shelving from 2’-0” AFF to 6’-0” AFF across 8’-0”(one double door section) width of the space. Remaining space to be deep enough to store 4 folding tables, and 18 stacking chairs. Reinforce walls as required to carry shelves with 30# per linear foot of shelf.

115 Janitor

Provide a floor mounted precast mop sink with a wall mounted stainless steel shelf including 3

mop holders. Faucet shall be designed to support a hanging bucket and threaded to accept a hose.

116 Training EMS
Provide an 8' wide x 4' tall white board/marker board centered on the exterior wall. Provide a tack board on the entrance wall.
Communications: Provide cable TV receptacle. Provide telephone/data outlets as indicated.
Partitions: Perimeter partitions shall have 3" acoustic batt insulation from floor to above the ceiling for a STC rating of approximately 51.

117 Men's Room
Handicapped Accessible Restroom. Room shall provide fixtures and partitions as indicated on the drawings. Accessories shall include a single mirror above lavatory, wall mounted soap dispenser, wall mounted paper towel dispensers, motion activated automatic fixture valves, motion activated lighting (ultrasonic or dual technology type), rigid finished insulation on exposed lavatory piping, tissue dispenser, coat hook on door, HC grab bars.
Partitions: Perimeter partitions shall have 3" acoustic batt insulation from floor to above the ceiling for a STC rating of approximately 51.

118 Women's Room
Handicapped Accessible Restroom. Room shall provide fixtures and partitions as indicated on the drawings. Accessories shall include a single mirror above lavatory, wall mounted soap dispenser, wall mounted paper towel dispensers, motion activated automatic fixture valves, motion activated lighting (ultrasonic or dual technology type), rigid finished insulation on exposed lavatory piping, tissue dispenser, sanitary napkin receptor, coat hook on door, HC grab bars.
Partitions: Perimeter partitions shall have 3" acoustic batt insulation from floor to above the ceiling for a STC rating of approximately 51.

119 Station Officer
Provide a tack board on the entrance wall.
Communications: Provide cable TV receptacle. Provide telephone/data outlets as indicated.
Partitions: Perimeter partitions shall have 3" acoustic batt insulation from floor to above the ceiling for a STC rating of approximately 51.

120 Assistant Chief
Provide a tack board on the entrance wall.
Communications: Provide cable TV receptacle. Provide telephone/data outlets as indicated.
Partitions: Perimeter partitions shall have 3" acoustic batt insulation from floor to above the ceiling for a STC rating of approximately 51.

120A Assistant Chief Bunk
Communications: Provide cable TV receptacle. Provide telephone/data outlets as indicated.
Partitions: Perimeter partitions shall have 3" acoustic batt insulation from floor to above the ceiling for a STC rating of approximately 51.

121 Vestibule
The Vestibule shall contain a wall mounted building directory. Vestibule walls to be brick and modular masonry to match exterior.
Exterior doors shall be insulated glass with laminated glass on interior face. Interior doors may be tempered glass in vision lites. Security camera mounted in the corner above doors to corridor 124.

122 Reception
Note: reception desk located in Copy File area.
Straight work counter adjacent to vestibule may be a systems furniture type and shall contain power and phone/data outlets.

Security pass-thru window to vestibule shall have voice component and counter. Pass-thru should be integrated with reception work counter. Pass-thru window shall be insulated glass with laminated glass on interior face. Pass thru should be below window and large enough to pass a notebook or legal pad(not drawer type). Voice component should allow for normal conversation between the receptionist and parties in the hall without strain to hearing nor requiring a raising of the voice. Openings shall be force protection, code compliant, and fully accessible.

Communications: Provide telephone/data outlets as indicated.

Provide a recessed stainless steel HC accessible electric water cooler near the restrooms.

123 Copy File Room
The desk shall be L shaped, include a raised counter/privacy screen to shield computer monitors, desktop work surface, drawers, and keyboard trays. The construction shall be hardwood and hardwood veneer plywood with a transparent finish. Reception desk shall have two 2” diameter conduits extending below slab, through the adjacent wall to ceiling plenum. Shall contain power and communications for a Fax and Copy machine and the following:
Communications: Provide telephone/data outlets as indicated.

124 Corridor 3

125 Chief Bunk
Communications: Provide cable TV receptacle. Provide telephone/data outlets.
Partitions: Perimeter partitions shall have 3” acoustic batt insulation from floor to above the ceiling for a STC rating of approximately 51.

126 Fire Chief
Provide a tack board on the entrance wall.
Communications: Provide cable TV receptacle. Provide telephone/data outlets.
Partitions: Perimeter partitions shall have 3” acoustic batt insulation from floor to above the ceiling for a STC rating of approximately 51.

127 Bunk
Space is temporary bunkroom (+-2 years). The government will remove partition between bunkrooms after completion of Phase 2. Finishes shall be continuous behind the temporary partitions.
Partitions: Perimeter partitions shall have 3” acoustic batt insulation from floor to above the ceiling for a STC rating of approximately 51. Temporary partition shall be 2-½” studs with pre-finished gypsum wallboard and 2 ½” acoustic batt insulation floor to ceiling to provide a STC of approximately 46.
Communications: Provide cable TV receptacle. Provide telephone/data outlets as indicated.

128 Bunk
Space is temporary bunkroom (+-2 years). The government will remove partition between bunkrooms after completion of Phase 2. Finishes shall be continuous behind the temporary partitions.

Partitions: Perimeter partitions shall have 3” acoustic batt insulation from floor to above the ceiling for a STC rating of approximately 51. Temporary partition shall be 2-½” studs with pre-finished gypsum wallboard and 2 ½” acoustic batt insulation floor to ceiling to provide a STC of approximately 46.
Communications: Provide cable TV receptacle. Provide telephone/data outlets as indicated.

129 Bunk
Space is temporary bunkroom (+-2 years). The government will remove partition between bunkrooms after completion of Phase 2. Finishes shall be continuous behind the temporary partitions.
Partitions: Perimeter partitions shall have 3” acoustic batt insulation from floor to above the ceiling for a STC rating of approximately 51. Temporary partition shall be 2-½” studs with pre-finished gypsum wallboard and 2 ½” acoustic batt insulation floor to ceiling to provide a STC of approximately 46.
Communications: Provide cable TV receptacle. Provide telephone/data outlets as indicated.

130 Men’s Showers
Provide HC access. Room shall provide fixture and partitions as indicated on the drawings. Accessories shall include (3) 3-foot long moveable locker room benches each with a 3-foot long stainless steel shelf above, a single mirror across the countertop, wall mounted s.s. framed full length mirror, wall mounted soap dispenser for each lavatory, wall mounted paper towel dispenser, tissue dispenser/coat hook in each toilet stall, HC grab bars in accessible stall. Provide a solid surface counter top with integral or under mounted lavatories. Provide motion activated automatic fixture values. Provide PVC covers on exposed lavatory piping. Provide a cove light above the counter. Provide motion activated lighting (ultrasonic or dual technology type),
Provide ceramic tile shower stalls, shower curtain, s.s. rod, ceramic soap dish, and towel hook for each shower indicated on the drawings. One shower shall be HC accessible including roll in threshold, adjustable showerhead, grab bars and provisions for future shower seat. Provide a floor drain and towel hook in each drying area as well as each shower.
Partitions: Perimeter partitions shall have 3” acoustic batt insulation from floor to above the ceiling for a STC rating of approximately 51.

131 Vestibule
Provide a wall mounted s.s. framed full length mirror

132 Women’s Shower
Provide HC access. Room shall provide fixture and partitions as indicated on the drawings. Accessories shall include 3 foot long moveable locker room bench with a 3 foot long stainless steel shelf above, a single mirror above the lavatory, wall mounted soap dispenser for each lavatory, wall mounted paper towel dispenser, tissue dispenser/napkin dispenser/coat hook in each toilet stall, HC grab bars in accessible stall. Provide motion activated automatic fixture values. Provide motion activated lighting (ultrasonic or dual technology type), Provide PVC covers on exposed lavatory piping.
Provide ceramic tile shower stall, shower curtain, s.s. rod, ceramic soap dish, and towel hook for each shower indicated on the drawings. Shower shall be HC accessible including roll in threshold, adjustable showerhead, grab bars and provisions for future shower seat. Provide a floor drain and towel hook in the drying area as well as each shower.
Partitions: Perimeter partitions shall have 3” acoustic batt insulation from floor to above the ceiling for a STC rating of approximately 51.

133 Physical Therapy
Provide an equipment whirlpool tub and all necessary accessories, a 3-foot moveable bench, 3-

foot stainless steel shelf and 4 towel hooks.
Partitions: Perimeter partitions shall have 3" acoustic batt insulation from floor to above the ceiling for a STC rating of approximately 51.

134 Communications
Provide dedicated interior room for communication equipment including telephone, cable television and data network support. Communication service to the building shall be underground. Provide floor openings and vertical shaft spaces as necessary. Telephone backboard (3) shall be ¾" thick fire retardant 4' x 8' plywood. The communications Room is the termination point for the Intercom System, Public Address System, CCTV System IDS, Fire Alarm and Telephone System.

135 Bunk
Communications: Provide telephone/data outlets.
Partitions: Perimeter partitions shall have 3" acoustic batt insulation from floor to above the ceiling for a STC rating of approximately 51.

136 Bunk
Communications: Provide telephone/data outlets.
Partitions: Perimeter partitions shall have 3" acoustic batt insulation from floor to above the ceiling for a STC rating of approximately 51.

137 Corridor 2

138 Outdoor Dining Area
Sealed and intergral color concrete patio pad for outdoor dining. A 3'-0" high masonry wall with precast concrete cap and modular precast masonry on all sides.

Exterior Entrance.
Adjacent to the public entrance (Vestibule 121) shall be a cast bronze (32"x16") dedication plaque set in the wall. Name and graphics to be provided during the shop drawing phase. Provide weatherproof, GFCI protected receptacle adjacent to each pedestrian entrance.

Dumpster Screen Wall.
Provide a dumpster enclosure that is an extension of the Equipment Screen Wall and constructed of the same materials (see below). Dumpster Screen shall be as tall as the dumpsters used for this project. Provide concrete apron in front of enclosure to support the front of the dumpster truck. Provide two galvanized steel bollards inside the enclosure to protect the rear wall.

Equipment Yard and Screen Wall.
Provide an equipment screen for all exterior mechanical and electrical equipment. Screen wall shall be as tall as tallest piece of installed equipment. The screen shall be modular precast and brick masonry with CMU backup and precast coping to match the building. Paint and seal inside CMU and grout wall solid. Size of screen shall allow for proper air circulation and servicing of the equipment as recommended by the equipment manufacturer Equipment shall be on concrete pads. Remainder of enclosed area may be paved with gravel or stone. Enclose with a lockable steel swinging gate and as per the IDG. See attachment # 12.

Building Sign
Provide building sign that complies with the Statement of Work, and as follows. Provide a building sign to be set on the west side of the Apparatus driveway of Phase 1 with the long axis perpendicular to 'A' Avenue with lettering on each side. See the Appendix, attachment to SOW 10 for additional requirements.

Phase II – This information regarding Phase II is not a contract requirement except as required by other parts of the RFP. Information is provided for coordination purposes.

Rm # Room Name

200 Apparatus Bays

Apparatus Bays shall have floors with non-slip chemical resistant type epoxy coating over concrete that is reinforced to support storage of emergency vehicles. Provide Bays with clear spans(no structural columns other than the perimeter of this space, see RFP drawings).Provide an attached vehicle exhaust removal system with attachment for two vehicles per bay. Floors are to slope to a trench drain, one per bay. Provide a bay outline with a 4" epoxy paint stripe for each bay. Electricity for each bay to be provided by an overhead access point located two points per bay each with a 120-volt, 20 ampere power cord reel. Each cord reel shall be connected to a separate 20 ampere branch circuit. Water and Compressed Air to have one overhead access point per bay. Doors for each bay will be hydraulic 4 folding type with a master control for all the doors mounted on each sidewall of Apparatus Bay area. Each door will have traffic signal style red/green lights for indicating closed/fully open status inside and out mounted in clear view of the vehicle cab. Each Bay will have doors on each end that are operable remotely from cab of the apparatus stored in that bay with a remote access control. Wall mounted hardwired door controls shall also be provided for each apparatus bay door at locations as indicated on the floor plans. Storage rack with coat hook and shelve for (30) sets of Firefighter turnout gear to be wall mounted on one wall of area. Lockers (2' x 2' type) for (5) sets turnout gear and assorted Firefighter equipment. Mount an emergency wash down sink on sidewall and provide an Emergency Shower area. Phase II Apparatus Bays to be heated. Communications: Provide telephone/data system outlets as indicated.

Partitions: Interior walls shall be painted concrete masonry units, rated as required by code.

Types of Vehicles and misc. equipment to be stored:

To be determined.

201 Decontamination

Decontamination shall have an 8" raised and reinforced concrete equipment pad for commercial washing equipment to hard mount to. Raised pad and floor shall slope to the floor trench drain. Equipment shall be a GFGI, UNIMAC Washer Alliance Laundry System. Rear wall shall have a continuous stainless steel counter 24" deep with a 12" high back splash and a stainless steel deep sink.

202 Electrical

Provide spare 4" PVC conduit below slab from floor adjacent to open wall area to 5' beyond the building perimeter for future cables. Arrange equipment in room to allow equipment removal and maintenance. Electrical service to the building shall be underground. Provide masonry screen walls around outdoor equipment/mechanical equipment area with lockable metal access gates. Walls shall be reinforced as necessary to carry equipment and conduit. Partitions: Perimeter partitions shall have 3" acoustic batt insulation from floor to above the ceiling for a STC rating of approximately 51. Electrical room shall be 1 hour rated. Communications: Provide telephone/data outlet as indicated.

203 Storage. Fire Service Equipment, to be determined.

Fire Extinguisher in wall cabinet.

204 Corridor 1

205 Bunk
Communications: Provide cable TV receptacle. Provide telephone/data outlets as indicated.
Partitions: Perimeter partitions shall have 3” acoustic batt insulation from floor to above the ceiling for a STC rating of approximately 51.

206 Bunk
See Room 205.

207 Bunk
See Room 205.

208 Mechanical
Provide dedicated interior space and exterior area for plumbing, fire protection, and HVAC equipment. Plan room to allow equipment removal and maintenance. Provide floor openings and vertical shaft spaces as necessary. All equipment shall be placed on concrete house keeping pads. Locate exterior mechanical equipment and air intake and openings in exterior walls to comply with force protection standards. Provide all requirements for Energy Management Control System in coordination with the base wide system.
Communications: Provide telephone/data system outlets as indicated.

Partitions: Perimeter partitions shall have 3” acoustic batt insulation from floor to above the ceiling for a STC rating of approximately 51. The space shall be 1 hour rated.

209 Vestibule
Exterior doors shall be insulated glass with laminated glass on interior face. Interior doors may be tempered glass.

210 Corridor 4

211 Bunk
See Room 205.

212 Bunk
See Room 205.

213 Bunk
See Room 205.

214 Communications
Provide dedicated interior room (as an extension of the Phase 1 Communications Room and it’s systems) for communication equipment including telephone, cable television and data network support. Communication service to the building shall be underground. Provide floor openings and vertical shaft spaces as necessary. Telephone backboard (2) shall be ¾” thick fire retardant 4’ x 8’ plywood.

215 Janitors Closet
Provide a floor mounted precast mop sink with a wall mounted stainless steel shelf including 3 mop holders. Faucet shall be designed to support a hanging bucket and threaded to accept a hose.

216 Men

Provide HC access. Room shall provide fixture and partitions as indicated on the drawings. Accessories shall include (2) 3-foot long moveable locker room benches each with a 3-foot long stainless steel shelf above, a single mirror across the countertop, wall mounted s.s. framed full length mirror, wall mounted soap dispenser for each lavatory, wall mounted paper towel dispenser, tissue dispenser/coat hook in each toilet stall, HC grab bars in accessible stall. Provide a solid surface counter top with integral or under mounted lavatories. Provide motion activated automatic fixture values. Provide PVC covers on exposed lavatory piping. Provide a cove light above the counter. Provide motion activated lighting (ultrasonic or dual technology type),

Provide ceramic tile shower stalls, shower curtain, s.s. rod, ceramic soap dish, and towel hook for each shower indicated on the drawings. One shower shall be HC accessible including roll in threshold, adjustable showerhead, grab bars and provisions for future shower seat. Provide Shower Door for one shower stall. Provide a floor drain and towel hook in each drying area as well as each shower.

Partitions: Perimeter partitions shall have 3” acoustic batt insulation from floor to above the ceiling for a STC rating of approximately 51.

217 Vestibule

Exterior doors shall be insulated glass with laminated glass on interior face. Interior doors may be tempered glass.

218 Corridor 3

219 Bunk

See Room 205.

220 Bunk

See Room 205.

221 Bunk

See Room 205.

222 Bunk

See Room 205.

223 Laundry

Laundry shall provide for residential washer and dryer. Dryer shall be vented to the exterior. Renovation of the Phase I Laundry into a storage space shall be a part of providing this space.

224 Women

Provide HC access. Room shall provide fixture and partitions as indicated on the drawings. Accessories shall include a 3-foot long moveable locker room bench with a 3-foot long stainless steel shelf above, a single mirror across the countertop, wall mounted s.s. framed full length mirror, wall mounted soap dispenser for each lavatory, wall mounted paper towel dispenser, tissue dispenser/napkin dispenser/coat hook in each toilet stall, HC grab bars in accessible stall. Provide a solid surface counter top with integral or under mounted lavatories. Provide motion activated automatic fixture values. Provide PVC covers on exposed lavatory piping. Provide a cove light above the counter. Provide motion activated lighting (ultrasonic or dual technology type),

Provide ceramic tile shower stalls, shower curtain, s.s. rod, ceramic soap dish, and towel hook for each shower indicated on the drawings. One shower shall be HC accessible including roll in threshold, adjustable showerhead, grab bars and provisions for future shower seat. Provide

Shower Door for one shower stall. Provide a floor drain and towel hook in each drying area as well as each shower.
Partitions: Perimeter partitions shall have 3” acoustic batt insulation from floor to above the ceiling for a STC rating of approximately 51.

225 Bunk
See Room 205.

226 Bunk
See Room 205.

227 Corridor 4

228 Bunk
See Room 205.

229 Bunk
See Room 205.

230 Court Yard
Provide an 8’-0” wide using a combination of concrete and pavers. Provide a landscape of grass, ground cover and shrubs in the space on both sides of the walk. The courtyard shall have an area drain in each landscape area.

CHAPTER 3

SITE PLANNING AND DESIGN

3-1 SCOPE OF WORK. This project consists of constructing a 13,325 S.F. Emergency Services facility at Fort Lee, VA. Imaginative site design is encouraged, however, the site boundaries and project composition are fixed. Based on the graphic and narrative descriptions of site opportunities and constraints provided, the Offeror shall provide a proposal verifying that the site meets the program requirements.

Phase 2 requirements are included for coordination. The RFP requires certain infrastructure be provided in Phase 1 that will support Phase 2. While the RFP does not require construction of Phase 2 site improvements or spaces to meet the requirements of the project, the Offeror may include all or portions of Phase 2 in his/her proposal as a betterment. Any betterment must be clearly defined.

3-2 SITE VERIFICATION. Graphic and narrative descriptions of site opportunities and constraints have been provided. The physical survey and topo has been done by C. Alan Bamforth. According to the physical survey there are water and sewer mains available within the project limits adequate to serve the facility. Each Offeror shall verify that the site meets the program requirements.

3-3 EXISTING CONDITIONS. A survey of the site and surrounding area is included in the RFP. It is the Offeror's responsibility to verify the Government-furnished survey and obtain all additional survey information that may be required for a completed design and construction project. Any discrepancies which are found in the Government furnished survey shall be brought to the immediate attention of the Contracting Officer for clarification. The Offeror shall expect to encounter utilities and portions of concrete footings buried and abandoned on site from previous construction, consisting of several temporary buildings located as shown on the historic Fort Lee General Site Plans. A visual survey and test pits (see Attachment 4 for test pit data) performed at the site also indicate the wide-spread presence of various materials from previous construction either disposed of or abandoned on site, including pipes, asphalt, wood, bricks, and portions of concrete footings/pads/curbs. The Offeror shall perform whatever additional test pits or investigations are deemed necessary to ascertain the presence of buried materials that could adversely affect construction and the life-cycle operation of the completed project. All buried or abandoned materials shall be removed to the aerial and vertical extent necessary to properly construct and operate, in accordance with the requirements of this RFP package, all project features including but not limited to the structures, utilities, and paving/site improvements. At a minimum, all existing materials including soils, beneath and a minimum of 10 feet beyond the indicated Phase I and Phase 2 structures, shall be removed to the deeper of 24 inches below existing grade or 6 inches beneath new footings, and deeper as necessary to fully remove any individual items and non-soil materials encountered within the excavation. All such excavated materials except for chlordane-contaminated soils shall be properly disposed of off Government property, except that satisfactory soils may be segregated and used on site, to the extent allowed herein, for fill in non-structural areas. According to the Environmental Assessment performed by Fort Lee, there is potential for chlordane to exist in soils associated with treatment of the previous foundations. For bidding purposes, the Offeror shall assume that all soils lying within and to 10 feet beyond the indicated footprints of the previous buildings, contain chlordane at concentrations consistent with a liberal soil treatment application rate. These soils shall be properly handled to protect worker health and safety, shall remain on site, and shall be incorporated into the finished construction with a minimum cover of 6 inches of clean material. When excavated in order to accomplish the required work as specified in this RFP, these soils shall be used on site for general site grading only, or for pavement subgrade if determined to qualify as satisfactory. See Chapter 4 for building pad structural fill requirements. Individual concrete items encountered on site less than 1 cubic yard in size, and all footing/curb segments regardless of length, shall not require additional payment to the Contractor.

3-3.1 **Utility Maps.** The locations of existing utilities shown on the site survey and utility maps are approximate only. The contractor must notify "Miss Utility" prior to any site excavation. The Offeror shall scan the construction site with electromagnetic or sonic equipment and mark the surface of the ground where existing underground utilities are discovered. Immediately contact the Contracting Officer if actual conditions vary from the topographic survey. Fifteen (15) days' notice is required for any utility disruptions.

3-4 EXCAVATION PERMITS. The Contractor shall notify Miss Utility before excavating or digging. *A digging permit shall be obtained from the Post prior to excavation.*

3-5 SITE DEVELOPMENT PLAN. Provide a site development plan that shows the spatial and functional arrangement of all facility requirements. The plan should ensure an economical, compatible and functional land use development that utilizes the advantages of the site and fosters visual order. The site development plan should show consideration for the site opportunities and constraints, program requirements, and specific site design criteria and guidance provided. The building *shall* have a *minimum* setback of minimum 82 feet from street and parking areas for force protection requirements. A 33-foot clear area around the building shall be established which shall not contain out buildings or dense landscap*ing* (equipment screen walls are allowed around hvac equipment). All utilities and power lines are available as shown on the attached Utility Plan. The site is mostly cleared. Large specimen trees on the site should be considered for retaining. The conceptual site layout provided in the RFP shall be further developed into the Site Development plan required under submissions.

3-5.1 **Land Use.** The plan for the area should reflect an optimum balance of floor area, open space, and pedestrian and vehicular circulation. The plan should show an efficient, organized and economical land use arrangement that is compatible and functional. This plan should show the relationship of the area to adjacent land uses.

3-5.2 **Buffer Area.** Provide appropriate buffer areas *and landscaping features* to separate and visually isolate the *Emergency Services Facility* parking areas.

3-6 GRADING AND DRAINAGE.
The grading plan should consider existing topography while recognizing standard gradients. There should be a balance of the quantity of cut and fill soils which would create a smooth transition of graded areas into the existing natural site. The plan should reflect selective site clearing that preserves groups of trees and select trees. Drainage design should manage site runoff to maintain rate of flow and quantity to 80 percent of pre-construction levels. The principles of positive drainage should be applied to control the conditions that remove rainfall away from facilities and functions. Site designs should utilize swales, grass depressions, and berms to control stormwater discharge and quality. Erosion and sediment controls shall be designed in accordance with the Virginia Erosion and Sediment Control Handbook, latest edition. Federal, State and local regulations regarding the design of stormwater management systems shall be considered the minimum design criteria. Additionally, minimize the impact of construction activities on drainage and prevent loss of soils by water and wind erosion. Specific submittals required for projects at Fort Lee are contained in Attachment 9 Stormwater Package to this RFP. Included are requirements for a site-specific stormwater pollution prevention plan, certification, and inspection requirements. Designs, which improve on existing water quality, by incorporating sustainable design principles, are encouraged, consistent with budget constraints and activity requirements.

3-7 GENERAL SITE DESIGN CRITERIA. The following are to be used as guidance for site design. Criteria: Virginia Erosion Sediment Control Handbook, Virginia Department of Transportation Roads and Bridge Standards, Virginia Wastewater Regulations, Virginia Water Works Regulations, National Fire Protection Association and DoD Force Protection Manuals. Analyze the existing site conditions (i.e.; land use, community facilities, off-site workplaces, etc.) and incorporate a site design that results in an aesthetically pleasing and functional design. The site design shall address the following:

orientation, site organization, spatial balance, character and scale, compatibility, life safety, circulation systems, views of the site, buffer zones, wind and noise control, land forms (i.e.; mounds, swales, depressions, etc.), lawns and shaded areas, vehicular access, parking spaces for staff, members, handicapped, visitors, motorcycles, service entrances, bus routes, connecting walks, utility corridors, fire protection access, site lighting, site furnishings, mechanical/electrical enclosures, dumpster enclosures, landscaping, and etc. *Signage shall be provided in accordance with the MUTCD, Manual on Uniform Traffic Control Devices, Millennium Edition.*

3-8 CIRCULATION AND PARKING. The vehicular and pedestrian circulation system shall promote safe, efficient movement of vehicles and pedestrians within the site area. Site design shall facilitate pedestrian traffic between facilities. Vehicular traffic shall be routed around the outer perimeter of building areas to the greatest extent possible. The vehicular and pedestrian circulation system should maintain the maximum separation of vehicles and pedestrians. Safe circulation systems have a clear hierarchy of movement, lead to a clear destination, and do not interrupt other functions. The following criteria shall be considered for designing streets and drives for vehicles and pedestrians.

3-8.1 **Vehicular Circulation.** Vehicular circulation layout is determined by applying the design vehicle templates to the site design. The passenger car class includes passenger cars and light delivery trucks, such as vans and pick-ups. The passenger car template is equivalent to the non-organizational - privately owned vehicle (POV). The truck class template includes single-unit trucks, recreation vehicles, buses, truck tractor-semi trailer combinations, and trucks or truck tractors with semi-trailers in combination with full trailers. Templates showing the turning movements for design vehicles are provided by the American Association of State Highway and Transportation Officials (AASHTO). Obtain templates and utilize them during the design of the facility. Provide the vehicle clearances that are required to meet traffic safety for emergency vehicles, service vehicles, and moving vans. Site entrances and site drive aisles shall include required traffic control signage. Maximize spacing between drives, incorporate right-angle turns, and limit the points of conflicts between traffic.

3-9 CRITERIA.

3-9.1 **Entrance and Intersection Design.** For site entrances and drive aisle intersections, provide "T" intersection offsets of at least 125 ft. The preferred angle of intersection is right-angle (90 degrees).

3-9.2 **Drive Aisle Design.** The selected design vehicle templates determine dimensions for drive aisles for parking lots. Minimum drive aisle shall be 24ft. clear. Vehicle Separation, corner radii, and sight distance are established when the design vehicle templates and speed limits are selected. Design pavements for the wheel loads associated with the design vehicle. Concrete entrances shall be provided at intersections with installation roads. Concrete pavement for fire truck access shall be a minimum of 10 inches thick with a VDOT base course minimum 6 inches thick. Bituminous pavements shall be provided with a VDOT base course of minimum 8 inches thickness.

3-9.3 **Privately Owned Vehicle (POV) Parking.** POV stalls without vehicle overhang shall be 10 ft x 18 ft. Handicap parking stalls shall be 13ft. x 18ft. with 5ft. cross striped for access. No parking signs per MUTCD shall be provided on ‘A’ Avenue to prevent parking on the access hardstand front ramp and portions of ‘A’ Avenue.

3-9.4 **Pedestrian Circulation.** Pedestrian circulation should be safe and separate from vehicle circulation. Provide good sidewalk layout to connect all building entrances with parking and site facilities and existing walks. Pedestrian circulation should be based on pedestrian desired lines of walking between site facilities and existing walks. Desired lines should be weighted to predict the most traveled routes. These routes would require paving. Topography and vegetation can be used to reinforce a sense of movement. Design pedestrian concentration areas with adequate paved area.

3-10 SIDEWALK DESIGN. Walks shall be a minimum of 4 ft. wide (unless shown otherwise on the attached drawings) exclusive of curb width, and constructed of wire mesh reinforced concrete, or a combination of concrete and pre-cast concrete or brick pavers, with a minimum thickness of 4 in. Where walks are adjacent to the curb, the curb width is not to be included as sidewalk. Ramps for handicapped individuals shall be provided at intersections by depressing street curbs and adjacent sidewalk.

3-11 LANDSCAPE PLANTING PLAN. Landscaping shall be in accordance with landscaping criteria, and plantings selected from attached plant list. The Offeror shall obtain and use the services of a qualified State certified landscape architect, experienced in site planning and planting design. A complete, integrated landscape-planting plan shall be provided the project. The design shall reflect appropriate groupings, foundation plantings, and street tree plantings to define the open spaces to ensure a complete landscaped project. Choose plant materials on the basis of plant hardiness, climate, soil conditions, low maintenance, and quality. Selected plant materials shall be native, easily maintained, and tolerant of the specific site conditions. Incorporate sustainable design principles into the selection of plants. Planting or seeding shall occur only during periods when beneficial results can be obtained. A minimum of 15 trees (2 ½" caliper minimum), 70 shrubs (5 gallon minimum), and appropriate ground covers shall be shown on the plan. All trees and shrub beds shall be mulched with shredded hardwood mulch. All disturbed site areas shall be finish graded and seeded. All areas within ten feet of sidewalks and face of building that are not planted with shrubs, ground cover, or trees shall be sodded.

3-11.1 **Trees, Shrubs, and Ground Cover.** Plant varieties shall be native species of nursery grown or plantation grown stock. They shall be grown under climatic conditions similar to those in the locality of the project.

3-11.1.1 **Quality.** Well-shaped, well-grown, vigorous, healthy plants having healthy and well-branched root systems shall be provided. Plants shall be free from disease, harmful insects and insect eggs, sunscald injury, disfigurement, and abrasion. Plants shall be provided that are typical of the species or variety.

3-11.1.1.1 **Shade and Flowering Trees.** A height relationship to caliper shall be provided. Height of branching should bear a relationship to the size and variety of tree specified, and with the crown in good balance with the trunk. Trees shall not be "poled" or the leader removed.

3-11.1.1.1.1 **Single Stem.** Trunk shall be reasonably straight and symmetrical with crown and have a persistent main leader.

3-11.1.1.1.2 **Multi-Stem.** All countable stems, in aggregate, shall average the size specified. To be considered a stem, there should be no division of the trunk, which branches more than 150 mm [6 in] from the ground level.

3-11.1.1.1.3 **Specimen.** A plant shall be provided that is well branched and pruned naturally according to the species. The form of growth desired, which may not be in accordance with natural growth habit, shall be as indicated.

3-11.1.1.2 **Deciduous Shrub.** Plants shall be provided having the height and number of primary stems as recommended by the agency having jurisdiction. An acceptable plant shall be well shaped with sufficient well-spaced side branches recognized by the trade as typical for the variety grown in the region.

3-11.1.1.3 **Coniferous Evergreen.** Provide the height-to-spread ratio as recommended by the agency having jurisdiction. Trees shall not be "poled" or the leader removed. An acceptable plant shall be exceptionally heavy, well shaped and trimmed to form a symmetrical and tightly knit plant. The form of growth desired shall be as indicated.

3-11.1.1.4 **Broadleaf Evergreen.** Provide the ratio of height-to-spread as recommended by the agency having jurisdiction. An acceptable plant shall be well shaped and recognized by the trade as typical for the variety grown in the region.

3-11.1.1.5 **Ground Cover.** Plants shall be provided with the minimum number of runners and length of runner as recommended by the agency having jurisdiction. Plants shall be furnished that have heavy, well developed, and balanced top with vigorous well developed root system, and shall be furnished in containers.

3-11.1.2 **Measurement.** Plant measurements shall be in accordance with the American Nurserymen's Association guidelines.

3-11.1.3 **Percolation Test.** Test for percolation shall be done to determine positive drainage of plant pits and beds. All soil and drainage conditions detrimental to the growth of plant material shall be identified and a proposal correcting the conditions shall be submitted.

3-11.1.4 **Soil Test.** A soil test shall be performed for pH, chemical analysis, and mechanical analysis to establish the quantities and type of soil amendments required to meet local growing conditions for the type and variety of plant material specified.

3-11.1.5 **Installation.** Verify the location of underground utilities. When obstructions below ground or poor drainage affect the planting operation, proposed adjustments to plant location, type of plant, and planting method or drainage correction shall be submitted. The plant material shall be installed during appropriate planting times and conditions recommended by the trade for the type and variety of plant material specified. Plant pits shall be excavated and backfilled as recommended by the agency having jurisdiction. The planting operation shall be performed only during periods when beneficial results can be obtained. When special conditions warrant a variance to the planting operations, proposed planting times should be submitted.

3-11.1.6 **Pruning.** The total amount of foliage shall be pruned by one-fourth to one-third on installed trees and shrubs to compensate for loss of roots and transplanting shock. The typical growth habit of individual plants shall be retained. Trees shall not be poled or the leader removed, nor shall the leader be pruned or "topped off."

3-11.1.7 **Maintenance During Planting Operation.** Installed plants shall be maintained in a healthy growing condition. Maintenance operations shall begin immediately after each plant is installed and shall continue until the plant establishment period commences.

3-11.1.8 **Plant Establishment Period.** On completion of the last day of the planting operation, the plant establishment period for maintaining installed plants in a healthy growing condition shall commence and shall be in effect for the remaining contract time period not to exceed 12 months. When the planting operation extends over more than one season or there is a variance to the planting times, the plant establishment periods shall be established for the work completed.

3-11.1.9 **Maintenance During Establishment Period.** The maintenance of plants shall include straightening plants, tightening stakes and guying material, repairing tree wrap, protecting plant areas from erosion, maintaining erosion material, supplementing mulch, accomplishing wound dressing, removing dead or broken tip growth by pruning, maintaining edging of beds, checking for girdling of plants and maintaining plant labels, watering, weeding, removing and replacing unhealthy plants.

3-11.1.10 **Unhealthy Plant.** A plant shall be considered unhealthy or dead when the main leader has died back, or 25 percent of the crown is dead. Determine the cause for an unhealthy plant. Unhealthy or

dead plants shall be removed immediately and shall be replaced as soon as seasonal conditions permit in accordance with the following warranty paragraph.

3-11.1.11 **Warranty.** Furnished plant material shall be guaranteed to be in a vigorous growing condition for a period of 12 months from the contract acceptance date regardless of the contract time period. A plant shall be replaced one time under this guarantee. Transplanting existing plants requires no guarantee.

3.11.2 **Turf.** Turf consists of seed, sod, and sprigs.

3.11.2.1 **Seed.** State approved seed of the latest season's crop shall be provided in the original sealed packages bearing the producer's guaranteed analysis for percentages of mixture, purity, germination, hard seed, weed seed content, and inert material. Labels shall be in conformance with applicable State seed laws. Seed mixtures shall be proportioned by weight. Weed seed shall not exceed one percent by weight of the total mixture.

3-11.2.2 **Sod.** State approved sod shall be provided as classified by applicable State laws. Each individual sod section shall be of a size to permit rolling and lifting without breaking. The sod shall be relatively free of thatch, diseases, nematodes, soil-borne insects, weeds or undesirable plants, stones larger than 2 inches in any dimension, woody plant roots, and other material detrimental to a healthy stand of turf. Sod that has become dry, moldy, or yellow from heating, or has irregular shaped pieces of sod and torn or uneven ends shall be rejected. Sod shall be machine cut to a uniform thickness of 1-1/4 inches within a tolerance of 1/4 inch excluding top growth and thatch. Measurement for thickness shall exclude top growth and thatch. The limitation of time between harvesting and placing sod shall be 36 hours.

3-11.2.3 **Sprig Quality.** The cultivars shall be provided as healthy living stems, stolons, or rhizomes with attached roots, including two or three nodes, and shall be from 4 to 6 inches long, without adhering soil. Sprigs shall be provided which have been grown under climatic conditions similar to those in the locality of the project. Sprigs shall be obtained from heavy and dense sod, free from weeds or other material detrimental to a healthy stand of turf. Sprigs that have been exposed to heat or excessive drying shall be rejected. The time limitation between harvesting and placing sprigs shall be 24 hours.

3-11.2.4 **Soil Test.** A soil test shall be performed for pH, chemical analysis, and mechanical analysis to establish the quantities and type of soil amendments required to meet local growing conditions for the type and variety of turf specified.

3-11.2.5 **Temporary Turf Cover.** When there are contract delays in the turfing operation or a quick cover is required to prevent erosion, the areas designated for turf shall be seeded with a temporary seed. When no other turfing materials have been applied, the quantity of one-half of the required soil amendments shall be applied and the area tilled.

3-11.2.6 **Final Turf.** The turf shall be installed during appropriate planting times and conditions recommended by the trade for the type and variety of turf specified. The turf operations shall be performed only during periods when beneficial results can be obtained. Drainage patterns shall be maintained. The turf shall be installed by using the methods as recommended by the trade for the type and variety of turf specified. Immediately after turfing, the area shall be protected against traffic or other use by erecting barricades and providing signage as required. The turf establishment period for establishing a healthy stand of turf shall begin on the first day of work under the turfing contract and shall end three months after the last day of the turfing operation. An unsatisfactory stand of turf shall be repaired as soon as turfing conditions permit.

3-11.2.7 **Satisfactory Stand of Turf.**

3-11.2.7.1 **Seeded Lawn Area.** A satisfactory stand of turf from the seeding operation for a lawn area is defined as a minimum of 15 grass plants per square foot. Bare spots shall be no larger than 6 inches square. The total bare spots shall not exceed two (2) percent of the total seeded area.

3-11.2.7.2 **Seeded Field Area.** A satisfactory stand of turf from the seeding operation for a field area is defined as a minimum of 10 grass plants per square foot. The total bare spots shall not exceed two (2) percent of the total seeded area.

3-11.2.7.3 **Sodded Area.** A satisfactory stand of turf from the sodding operation is defined as living sod uniform in color and texture. Bare spots shall be no larger than
2 in. square.

3-11.2.7.4 **Sprigged Area.** A satisfactory stand of turf from the sprigging operation is defined as a minimum of 2 sprigs per square foot. Bare spots shall be no larger than 9 in. square. The total bare spots shall not exceed two (2) percent of the total sprigged area.

3-11.2.8 **Maintenance During Establishment Period.** The maintenance of the turfed areas shall include eradicating weeds, eradicating insects and diseases, protecting embankments and ditches from erosion, maintaining erosion control materials and mulch, protecting turf areas from traffic, mowing, watering, post-fertilization, and replacing unsatisfactory turf areas.

3-11.3 **Plant and Insect Control.** Comply with the Plant and Insect letter included in the attachments to this RFP**.**

3-12 SPRINKLER AND/OR IRRIGATION SYSTEM. Not required

CHAPTER 4

SITE ENGINEERING

4-1 SOILS.

4-1.1 **Soil Data and Contractor-furnished Geotechnical Report.** Preliminary soil boring logs, lab testing results, and summarized test pit results, are included as Attachment 4 to this RFP. The locations of the soil borings and test pits are shown on the site plan drawings attached to this Statement of Work. Based upon the attached preliminary data, and experience at Fort Lee, the Offeror may assume for bidding purposes that a shallow foundation system, using an allowable bearing capacity in the range of 1500 to 2000 psf, will be appropriate for the required structure. The attached preliminary data provide an overview of soils and geologic and groundwater conditions, and though they are furnished for informational purposes only, the Offeror is encouraged to carefully review and consider their content, prior to submitting an offer. The Offeror to whom this contract is awarded shall, with their consulting professional engineer having experience in geotechnical engineering in the project's geographic region, be responsible for determining site-specific geotechnical conditions at the project site and providing a site-specific geotechnical conditions report. The successful Offeror shall perform additional subsurface explorations and/or testing to supplement the preliminary information provided in the RFP package, as required to fully comply with all requirements of this Statement of Work. The additional subsurface exploration shall include a sufficient number of soil borings and excavation pits performed within the building footprint and parking/utility/landscape areas to ascertain the physical properties and the arrangement of the underlying materials; in this regard, the Offeror is directed to paragraph 3-3 Existing Conditions of this Statement of Work, and to the attached test pit results and soil boring logs. <u>All additional information required to properly design and construct the project, shall be obtained by the contractor [Offeror] at no additional cost to the government.</u>

4-1.1.1 The Contractor [Offeror] provided site-specific geotechnical conditions report, and the final plans and specifications, shall include all field test and exploration data and a tabulation of all laboratory test data, including copies of the exploration and test data attached to this RFP. In addition, the report shall include all design/construction recommendations/conclusions, backed by analyses/calculations. Full consideration shall be given to the possible future construction of a Phase 2 addition to the west, when designing all foundation features including but not limited to footing dimensions/depths and preparation of bearing soils, possibly including any necessary surcharging of the future Phase 2 footprint area, to result in a maximum ¼ -inch differential settlement relative to Phase 1. Recommendations/conclusions shall be supported by field and laboratory test data, as applicable, and when approved shall be fully incorporated into the Final (complete) drawings and specifications. The report shall be stamped and signed by a registered professional engineer, specializing in geotechnical engineering consultation and having experience in the project's geographical region. The report shall include, but not be limited to:

4.1.1.1.1 Classifications of soil.
4.1.1.1.2 Bearing capacities and recommended bearing pressures for soil.
4.1.1.1.3 Required footing widths and minimum footing depths.
4.1.1.1.4 Required minimum depths for utilities.
4.1.1.1.5 Recommendations for design of retaining walls, drainage systems, pavements, cut and fill slopes, floor slabs and foundation systems, etc.
4.1.1.1.6 Settlement calculations for slabs/footings.
4.1.1.1.7 Soil preparation, including over excavation and backfill requirements, and compaction requirements.

4.1.1.1.8 Groundwater characteristics, including perched water, and related construction requirements.
4.1.1.1.9 Surface and subsurface drainage.
4.1.1.1.10 Soil resistivity readings and cathodic protection recommendations, as applicable, to underground utilities and other proposed subsurface materials.

4-1.1.2 **Certification.** The Offeror and his or her professional geotechnical engineer consultant shall certify in writing that the design of the project has been developed consistent with the site specific geotechnical conditions and with all applicable review comments. The certification shall be stamped by the consulting professional geotechnical engineer, who shall take an active role in the preparation of the related plans and specifications, and a separate certificate shall be submitted with each of the 50 percent and final design submissions

4-1.2 **Soil Preparation and Compaction**.

4-1.2.1 After stripping the upper 24 inches and removing buried items and unsuitable materials from the proposed building area in accordance with paragraph 3.3, the area shall be leveled and compacted as recommended by the Contractor's Geotechnical Engineer. A geotextile fabric having an apparent opening size (AOS) not larger than US Sieve No. 50 shall then be spread flat and unwrinkled over the prepared surface, using a minimum overlap of 18 inches along all edges, prior to placing Structural Fill.

4-1.2.2 The existing subgrade soils are subject to loss of strength and will become unstable for construction equipment during wet weather, and shallow perched water is commonly encountered at Fort Lee. The Contractor shall expect construction activities to be curtailed during and after wet periods, and shall replace at their expense any subgrade soils or placed materials that become unsatisfactory due to over-stressing, weather, or any other causes. Existing soils associated with previous foundations shall be assumed to contain chlordane; see Paragraph 3-3 Existing Conditions for requirements.

4-1.2.3 Soil compaction shall be achieved by equipment approved by a professional geotechnical engineer consultant. Fill or backfill materials shall be placed in maximum 6-inch compacted thickness lifts, and shall be moistened or aerated as necessary to provide the moisture content that will readily facilitate obtaining the compaction specified with the equipment used. Compact subgrade materials and each layer of fill beneath structures and pavement subbase to not less than 90 and 95 percent, and general grading materials to not less than 85 and 90 percent, of ASTM D-1557 maximum laboratory density for cohesive and cohesionless soils respectively. Structural Fill material for fill/backfill placed within and a minimum of 5 feet beyond both Phase 1 and Phase 2 building footprints shall consist of clean natural well-graded sandy material containing less than 20 percent by weight fine-grained (passing No. 200 sieve) material. Cohesionless materials are defined as containing less than 10 percent by weight fine-grained material; all other materials shall be considered to be cohesive.

4-1.2.4 The following minimum testing requirements for subgrade, fill, backfill, and aggregate base materials shall be incorporated into the specifications:

a) A minimum of one moisture density test (ASTM D1557) shall be performed for each on-site or borrow soil material proposed for fill, backfill, and base course.
b) One Atterberg Limits test (ASTM D 4318) and one gradation analysis (ASTM D 422) shall be performed for every ten field density tests.
c) A minimum of one sand cone field density test (ASTM D 1556) is required for every 10 nuclear gauge field density (ASTM D 2922) and moisture (ASTM D 3017) tests. Results by ASTM D 1556 shall govern, and results by ASTM D 2922 shall be adjusted (calibrated) accordingly.
d) Field Density tests (ASTM D 1556 or ASTM D 2922) shall be performed on compacted subgrade and on each layer of fill/backfill/base at minimum frequencies of:
   i) One test per column footing and per 100 feet of foundation wall.
   ii) One test per 100 feet of utility trench.
   iii) One test per 2000 square feet of paved area and building area, and per 4000 square feet for

all other areas.

4-1.2.5 These requirements shall be verified or betterments recommended by the consulting professional geotechnical engineer in the report wherever engineering, soils, or climatic factors indicate the necessity. These requirements shall also be verified to be consistent with the selected foundation system. Any modification to the stated compaction requirements shall be supported by engineering analysis and shall require the approval of the Contracting Officer. The final approved requirements shall be specified and/or shown in the final contract submission documents.

4-1.3 **Capillary Water Barrier.** A capillary water barrier is required for all interior slabs on grade. As a minimum, the capillary water barrier shall be 6 mil polyethylene with all joints and seams taped to provide a continuous barrier and underlain by a minimum 6 inches of well-draining and structurally adequate granular material consisting of VDOT Size No. 57 or approved equivalent.

4-1.4 **Soil Treatment.** Soil treatment for termites shall be by the chemical method and shall be applied to all excavation surfaces, both horizontal and vertical, located within the building line, and to any other surfaces deemed necessary to provide the required protection. The Contractor shall be duly licensed in the Commonwealth of Virginia to apply the selected and approved soil treatment termiticide. The Contractor shall provide a 5-year written warranty against infestations or re-infestations by subterranean termites of the building constructed under this contract. Warranty shall include annual inspections of the building. If live subterranean termite infestation or subterranean termite damage is discovered during the warranty period, and the soil and building conditions have not been altered in the interim, the Contractor shall: a. Re-treat the soil and perform other treatment as may be necessary for elimination of subterranean termite infestation, b. Repair damage caused by termite infestation, and c. Re-inspect the building approximately 180 days after the re-treatment. Soil treatment termiticides shall be currently registered by the EPA. Manufacturer's label and Material Safety Data Sheet (MSDS) for pesticides proposed for use shall be submitted to the Contracting Officer for approval, prior to application.

4-2 EROSION AND SEDIMENT CONTROL. Erosion and Sediment Control Facilities shall be required in accordance with Virginia Erosion Sediment Control Handbook latest edition.

4-3 DEMOLITION. Demolition and removal of existing materials shall be performed as necessary to properly construct the project, and the appropriate requirements shall be detailed in the plans and specifications. See paragraph 3-3 Existing Conditions of this Statement Of Work and the Site drawings for descriptions and locations of materials to be expected and for other specific requirements.

4-4 CLEARING AND GRUBBING. Clear and grub all trees and vegetation necessary for construction; but save as many trees as possible. All timber removed from the project site shall become the property of the Contractor, unless otherwise indicated or specified.

4-5 WETLANDS. Jurisdictional tidal and non-tidal wetlands have not been identified on the project site.

4-6 EARTHWORK. The contractor is responsible for obtaining subsurface soil information for design purposes, and for incorporating directly into the Final (complete) drawings and specifications all requirements of paragraphs 3-3, 4-1.2, 4-1.3, and 4-1.4.

4-7 BORROW MATERIAL. Obtain borrow material required for construction from sources off government property.

4-8 WATER DISTRIBUTION SYSTEM. The design of the water distribution system shall be in accordance with the American Water Works Association (AWWA)*, and Virginia waterworks regulations*. Where the requirements of the agency having jurisdiction and the requirements defined herein disagree, the more stringent shall apply. The contractor shall determine the domestic and the fire demands for the

facilities and shall verify the design of all components of the domestic and fire protection supply systems. Design of a water distribution system requires both domestic and fire flow demands be considered concurrently. *Virginia American Waterworks will* design and *install all mains to the 5 ft. line.*

4-8.1 **Analysis of Existing System Capacity.** Analysis of the existing system is not required.

4-8.2 **Connections to Water Mains and Building Service Lines.** Virginia American Waterworks shall be responsible for the design of the sizes, locations, and means of connections to the existing system. The contractor shall contact Virginia American Waterworks (P.O.C. *Mr. Hanchek* 804-458-4207) and arrange and pay for connection, design, *and installation* costs of the water service *to the 5 ft. line* .

4-8.2.1 **Connections to Water Mains.** The contractor shall coordinate the connections to the station water system including the meter assemblies and the necessary backflow-preventing devices. Fire protection system shall be considered as that part of the distribution system supplying fire hydrants, or fire hydrant laterals. Service connections shall supply water from the main to the building. Sufficient sectional control valves shall be provided so that no more than two fire hydrants will be out of service in the event of a single break in a water main. A copper tracer wire shall be placed directly above all non-metallic mains when plastic marking tape does not provide means of determining alignment of pipe by metal detecting equipment. The pipe, valves, and all other materials shall meet the requirements of the agency having authority or Insert the installation standards for a 150 -psi working pressure system. Any operations of valves on the existing system must be coordinated with Virginia American Waterworks. Any temporary connection to the system shall be provided with an approved RPZ type backflow preventer.

4-8.2.2 **Building Connections.** Design and construction shall be in accordance with the *International* Building Code *(IBC),* latest edition. *A shut-off valve is required approximately 5 ft. from the building.*

4-8.3 **Trenches.** Water and gas mains may not be installed in the same trench. Water mains shall have a minimum earth cover of 30 inches as specified by the agency having jurisdiction. Adequate cover must be provided for freeze protection. Where frost penetrates to a depth greater than the minimum above, greater cover will be required. Sufficient cover must also be provided to protect the pipe against structural damage due to superimposed surface loads. Lines installed with less cover than the minimums stated shall be concrete encased with a minimum concrete thickness of 6 inches.

4-8.4 **Fire hydrants.** Hydrants and valves shall conform to the requirements of the agency having jurisdiction. Fire hydrants shall be dry barrel type, compatible with those presently in use at the installation, with similar pump and hose connections. The maximum amount of flow that can be permitted shall be determined. Fire hydrant spacing shall be no greater that 500 ft. apart by paved road. In addition, a hydrant shall be provided so that all parts of the facilities can be reached by hose lines not over 350 ft. long. All distances shall be calculated along the closest route that the fire apparatus must travel (i.e.; along the curb or access lane). Each hydrant may account for a maximum of 1500 gpm of fire protection regardless of existing pressures or water line capacity. A fire hydrant shall be located within 50 ft. from any fire department connection provided. Hydrant laterals shall be 6 inches minimum size, and shall not exceed 50 ft. in length, and shall have an underground shutoff valve. Valve box, at each lateral, shall be located within 10 ft. of the hydrant, and shall not be located where obstructed by parked vehicles, shrubbery, etc. Guard post barriers shall be provided where hydrant locations are subject to vehicle damage.

4-8.5 **Shutoff Valve.** Each building shall be provided with a separate service and main shutoff valve, readily accessible to maintenance and emergency personnel. Shutoff valves in walks are prohibited.

4-8.6 **Metering.** A water meter is required per the installation metering requirements. Meter and

backflow preventor shall be approved by Virginia American Waterworks. The meter shall be set in an approved meter vault if installed outside the building.

4-8.7 **Materials.** *Water mains shall be Ductile Iron, and service lines shall be copper*. Copper water service lines will be dielectrically isolated from ferrous pipe. Dielectric isolation shall conform to the requirements of the agency having jurisdiction. For ductile iron piping systems (except for ductile iron piping under floor in soil) conduct an analysis to determine if cathodic protection and/or bonded or unbonded coatings are required. Unbonded coatings shall conform to the requirements of the agency having jurisdiction. All pipe lines 4 inches and larger shall be restrained per DIPRA guidelines.

4-8.8 **Resistivity Analysis.** Conduct a soil resistivity analysis to determine if cathodic protection and protective coatings should be provided for the following structures in soil resistivity conditions above 10,000 Ohm-cm: ferrous metallic potable water lines; Concentric neutral cable; Other buried and submerged ferrous metallic structures not covered above; Ferrous metallic piping passing through concrete shall not be in contact with the concrete.

4-8.9 **Field Quality Control for Water Distribution.** The Contractor shall perform field tests, and provide labor, equipment, and incidentals required for testing. Tests include Hydrostatic Leakage Test and Bacteriological Disinfection Testing of the installed pipelines. Do not begin testing on any section of a pipeline where concrete thrust blocks have been provided until at least 5 days after placing of the concrete. Testing procedures and requirements shall comply with the requirements of the agency having jurisdiction.

4-9 SANITARY SEWERAGE SYSTEM. The design of the sanitary sewer distribution system shall be in accordance with the Virginia Wastewater Regulations, State Department of Health. Where the requirements of the agency having jurisdiction and the requirements defined herein disagree, the more stringent shall apply. The contractor shall determine the sewerage contribution for the facility and shall verify the design of all components of the sanitary sewer system.

4-9.1 **Analysis of Existing System Capacity.** An analysis of the existing system is not required.

4-9.2 **Calculate Sewage Contribution.** Calculate the sewage contribution from the new facilities in accordance with the Virginia Health Department Wastewater Regulations.

4-9.3 **Connections to Sewage Collection Mains and Building Service Lines.** The contractor shall be responsible for the design of the sizes, locations, and means of connections to the existing system based on Facility requirements and system conditions. Establish the location for the connection based upon economics and site design parameters. Connect to gravity mains with a manhole.

4-9.3.1 **Building Sewer Laterals and Connections.** Laterals and building connections shall be designed and constructed in accordance with the Uniform Building Code latest edition. Minimum diameter for *building service* laterals shall be 6 inches, while maintaining a minimum velocity of 2.5 fps.

4-9.3.2 **Main Collection Trunks.** Pipe sizes and slopes shall be calculated using the Manning Formula. Manholes are required at all changes of direction and spaced not more than 300 ft apart. Curved sewers are prohibited. Pipes shall be designed to flow full and maintain a minimum velocity of 2.5 fps. If siphons are used, two lines of equivalent capacity shall be used with clean-outs.

4-9.4 **Trenches.** Sewer and water lines, mains or laterals, shall be placed in separate trenches. The separate trenches shall maintain a minimum lateral separation of 10 ft.

4-9.5 **Minimum Sewer and Water Distribution Pipe Separation Requirements.** Parallel water and sewer pipe and crossings between water and sewer pipe shall be in accordance with the state *code, and* local agency having jurisdiction.

4-9.6 **Cover.** Sewer lines shall be located at a depth greater than the frost penetration. Coordinate with building connection requirements. To prevent the pipe from being crushed by construction vehicles and the facility use vehicles, the minimum cover above the top of pipes shall be 30 inches unless *specially approved* pipe materials are used and/or unless the pipe is concrete encased with a minimum of 6 inches thickness of concrete.

4-9.7 **Field Quality Control for Sanitary Sewer Distribution System.** The Contractor shall perform field tests, and provide labor, equipment, and incidentals required for testing. Pipelines and manholes shall be tested for leakage, infiltration and exfiltration.

4-10 STORMWATER MANAGEMENT SYSTEMS. State of Virginia has jurisdiction for storm water management and drainage system design. The storm drainage system shall be properly coordinated with surrounding properties to ensure that runoff does not cause damage to other properties. All storm water management calculations shall be based upon a 10-year storm frequency. Design storm water management systems in accordance with the applicable requirements of the Virginia Erosion and Sediment Control Handbook or in accordance with the requirements of the agency having jurisdiction. The calculation of runoff and the evaluation of existing storm sewer drainage systems shall be as described herein paragraph entitled “Storm Drainage Collection Systems and Grading”. Obtain required permits from the agency having jurisdiction prior to construction. The contractor shall maintain the post development runoff flow at discharge point to 80 percent of pre-development by providing best management practices.

4-10.2 **Storm Water Retention/Detention System for Volume Control.** For volume control, an on-site storm water detention system may be required. The system may consist of swales, *depressions*, dry detention, or a combination of these features, wet ponds are discouraged. The system should be designed to satisfy requirements for Phases I and Future Phase II as shown on the attached Site Plan.

4-10.3 **Storm Water Retention/Detention System for Runoff Treatment.** For runoff treatment, *a series of* on-site storm water detention system *of Best Management Practices may be* required based on the VPDES requirements or Local Government requirements. The system shall be designed to satisfy requirements for Phases I and Future Phase II as shown on the attached Site Plan.

4-11 STORM DRAINAGE COLLECTION SYSTEMS AND GRADING.

4-11.1 **Location of Connections to Existing Systems.** The contractor shall make utility connection as determined by analysis. Establish the location for the connection based upon economics, design requirements, and downstream capacity. Connect with a manhole or appropriate drainage structure.

4-11.2 **Building Connections.** Connection to building roof or area drain lines shall be designed and constructed in accordance with the Uniform Building Code latest edition.

4-11.3 **Storm Sewer System.** The storm sewer gravity drainage collection system shall be designed and constructed in accordance with the requirements of State of Virginia VDOT drainage manual and Road and Bridge *Standards and* Specifications. Storm sewer system shall be designed for a minimum of a 10-year return frequency and pipes shall be sized for full flow. The minimum velocity of flow in conduits during a design storm shall be 2.5 fps. The pipe capacity shall be determined so that the calculated

hydraulic grade line of the storm sewer drainage system(s) shall not exceed the curb flow line grade in pavements and the finished site grades.

See attachment 9 for Stormwater Package. The certificates, plans, and forms shall be used for this project.

4-11.4 **Manholes and Inlets.** Manholes shall be located at intersections and changes in alignment or grade. Intermediate manhole maximum spacing shall be 250 ft. for pipes 3 ft. or less in diameter or box drains with the smallest dimension less than 3 ft. Maximum spacing for intermediate manholes on larger pipes and drain boxes shall be 500 ft. Manholes and manhole appurtenances shall be pre-cast concrete or brick and shall conform to the *VDOT Road and Bridge Standards, 2001*. Shape and smooth manhole inverts to the shape of the pipe with cast in place concrete after installing pipes. The manhole lid shall have a 2 ft. minimum opening as measured from the face of the wall or ladder where applicable.

4-11.5 **Drainage of Grass Areas.** Except at personnel and overhead doors, the difference in grade between the finish floor elevation and the surface of the ground immediately adjacent to the building shall be a minimum of 6 inches. Minimum slopes across grass surfaces shall be one percent. In grass areas, overland sheet flow shall be held to a maximum length of 100 feet; then, a swale or an inlet must be used. Minimum slopes in swale centerlines shall be 0.5 percent. Maximum swale side slopes shall be 1V: 4H. Ditches shall not be permitted. Storm drain pipe, sheet flow surfaces, and swales shall be designed to prevent standing water under normal conditions. *Provide adequate inlets to drain all turf areas without overland flow over walkways.*

4-11.6 **Drainage of Roads and Pavements.** Provide a positive crown in all streets and roads. Minimum cross slopes in streets and roads shall 1/4”:1’ and the maximum cross slope shall be 3/8”:1’. Minimum sheet flow slopes across parking area and other paved areas shall be 1 percent. Curbs and gutters shall be installed at a minimum longitudinal slope of 0.30 percent. Pavement collectors for storm water shall be by curb inlets and gutters, or drop inlets. Field inlets and an underground collection system shall drain open areas. Ditches shall not be permitted. Gutter spread (or inlet approach spread) in roads shall not exceed 10 ft. when measured from the face of curb. The amount of runoff to any one inlet in roads and parking areas shall not exceed the capacity of that inlet. The maximum spread allowable for determining inlet capacity shall equal that allowed for gutter spread in roads. The maximum spread allowable for determining inlet capacity in parking areas shall be height of curb or a depth of 6 inches, whichever is less.

4-11.7 **Materials.** All materials shall be in accordance with VDOT Roads and Bridge Std. or installation criteria. Select the allowable pipe materials based upon local conditions and facility criteria. Pipe for culverts and storm drains may be of reinforced concrete, ductile iron, corrugated steel, corrugated aluminum alloy, ABS, PVC, or HDPE. Culverts under paved areas shall be reinforced concrete with watertight joints.

4-11.8 **Field Quality Control for Storm Drainage System.** Testing procedures and requirements shall comply with the requirements of the agency having jurisdiction.

4-12 Gas Distribution. Materials and connection fees and methods shall be coordinated with the Fort Lee natural gas supplier. Pipe material shall be approved by the gas supplier. A meter shall be provided and located as approved by the gas supplier.

4-13 PAVEMENT DESIGN CRITERIA. Pavement design shall be in accordance with AASHTO methods using soils data from the Contractor [Offeror] prepared site-specific geotechnical conditions report and as specified in this Statement of Work. Concrete curb and curb/gutter shall be required at the perimeter of all streets, roads, parking areas, and interior islands. For streets and roads, the design category for this facility is one; the anticipated axle load for design is *26*,000 pounds; and the estimated volume of traffic is 1000 per day. For existing subgrade soils after compaction use a California Bearing

Ratio (CBR) of 7, and for uncompacted existing subgrade soils use a CBR of 4, unless soils test results indicate a lower value is appropriate. For parking areas, the design vehicle for this facility is passenger cars, panel and pickup trucks, the anticipated axle load for design is 18,000 pounds, and the estimated volume of traffic 1000 per day. For rigid pavements, use a maximum Modulus of Soil Reaction (K) of 125 pounds per cubic inch (pci) for existing subgrade materials after compaction. Designs for streets, walks, roads, and parking areas shall include adequate space for trees. *For hardstands the design vehicle shall be a* fully loaded *ladder-type fire truck.*

4-14 PERMIT REQUIREMENTS. Timely acquisition of all the necessary design related permits shall be the responsibility of the contractor; including the erosion and control permit, storm water management permit, discharge permit, and the health department permit(s). Operating permits and licenses shall be the responsibility of the Contractor, in accordance with Section 00721, "Contract Clauses". Timely acquisition of all the necessary design and construction related permits shall be the responsibility of the contractor. As some permit process times take 6 months or more, the Contractor, upon notice to proceed, shall immediately begin working on the permits so as not to delay completion of the project. The following permits have been identified as potentially being required for this project: Health Department Permits for Sanitary Sewer and Water distribution, Storm Water Management, Erosion and Sediment Control, National Pollution Discharge Elimination System, Excavation Permit, Demolition Permit, and Disposal Permits.

4-15 **ELECTRICAL DISTRIBUTION.** All exterior electrical design shall be coordinated with the Directorate of Engineering and Logistics (DEL). (Mehboob Munshi, 804-734-5040). Design analysis shall include meeting minutes of coordination effort.

A. TAP POINT

Power to the new facility shall be obtained from the existing underground lines that run along Adams Avenue at the edge of the site (13.2Y/7.62KV, 3-phase, 4-wire). See RFP Site Plan for location of tap point. Existing feeder in Manhole # 15 (3-1/C 500 MCM copper (15kv, 133% EPR insulation) and one 500 MCM (600V copper neutral) shall be tapped to supply a new underground radial feeder to service the new Fire & Emergency Service Center Phase 1 as well as all future Phases. Connections within the manhole shall be made using modular separable 15 kv splices rated 600A. Splices shall be suitable for submersion. Extend existing feeder, including neutral, from tap manhole to loop feed new pad-mounted 4-way primary switch (load make/ load break type). Switch shall include two switched ways for loop connection and two fault protected tap ways, one for service of Phase 1 & 2 service transformer and a second for service to future phases service transformer(s). Provide 2-5" conduit stub-out capped for future connection to spare switch way. Loop feeder shall match existing feeder characteristics. Provide primary feeder to FESC service transformer in 2-way 5" concrete encased duct bank, sized as indicated. Transformer shall be located in screened area with engine generator set and chiller. Secondary service conductors in conduit from the transformer shall be run underground into the phase one electrical room, and stubbed up into the building service equipment.

4-15.1 Underground distribution. System shall consist of concrete encased duct and copper conductors. Design shall be in accordance with ANSI C2, National Electrical Safety Code, and NFPA 70, National Electrical Code. Existing exterior aerial power, lighting and communications lines on the site (along A Avenue) shall be removed. All primary ducts shall be 5 inch diameter. A minimum of one spare duct, sized to match active ducts, shall be provided for primary and building secondary service lines.

4-15.2 Service entrance. Shall be in accordance with NFPA 70.

4-15.3 Transformer. Transformer shall be pad-mounted, loop-feed primary type located in mechanical equipment yard. The high voltage compartment shall contain incoming primary feeder, load break switch, fuse protection including overload and backup current limiting types and surge protection. The nameplate rating for the transformer shall not be less than 100 percent of the sum of Phase 1 and Phase 2 demand loads calculated for the transformer.

4-15.4 Roadway and area lighting. Luminaires shall be high pressure sodium (HPS), pole mounted, sharp cutoff distribution, shoebox-type. Lighting shall be provided in accordance with the IES Lighting Handbook. Provide roadway, area and parking area lighting. Replace existing street lighting along A Avenue with new lighting system served by new underground street lighting circuitry. New street lighting shall match existing underground fed street lighting west of the project site along A Avenue in appearance and height. Area lighting shall be provided at intervals not exceeding 100 ft along area walkways not otherwise illuminated. Exterior lighting fixtures and poles shall comply with the Ft. Lee Installation Design Guide.

4-15.5 Parking Lot Lighting. Parking lots shall be illuminated using EMCS controlled, luminaries. (Coordinate EMCS connection requirements with Ft Lee DEL Operations Shop with Mr. George Springer at 804-734-3167. Parking lot lighting design shall provide an average intensity of 2.0 (two) foot-candles (maintained) with a uniformity ratio of 4:1 (avg. to min.). “No Parking” signs are to be lit by the parking lot lighting and are NOT to be individually lit with a dedicated sign light.

4-15.6 Lighting Poles and Foundations. Poles shall be anodized bronze finish on aluminum, mounted on a reinforced concrete pedestal at least 24 inches in diameter (or square) with sufficient depth below grade to resist overturning. Poles within vehicular traffic areas or within 3 feet of such areas shall have their concrete foundations extend 32 inches above finished grade. Pole installations shall be designated to withstand a basic wind velocity of 90 MPH with a 1.3 gust factor.

4-15.7 Metering. Provide KWH/KWH meter capable of being read manually and connected to the base EMCS system to provide suitable pulse metering signals of 10 pulses per second at 80 percent of circuit (not meter) capacity. Meters shall be non-resetable with a local analog display and shall be as follows: Watt-hour meters shall meet ANSI Standards C12 and C12.10, except numbered terminal wiring sequence and case size may be the manufacture's standard. Watt-hour meters shall have a 15-minute, cumulative form, demand register meeting ANSI C12.4 and provided with not less than two and one-half stators. Watt-hour demand meters shall have factory-installed electronic pulse initiators meeting the requirements of NEMA F1 13. Pulse initiators shall be solid-state devices incorporating light-emitting diodes, phototransistors, and power transistors, except that mercury-wetted output contacts are acceptable. Initiators shall be totally contained within watt-hour demand meter enclosure, shall be capable of operating up to speeds of 500 pulses per minute with no false pulses, and shall require no field adjustments. Initiators shall provide the maximum number of pulses per KWH up to 500 per minute with a 5-amp input and one pulse per KWH. It shall not provide less than that which is obtainable from the manufacturer. Mount watt-hour electric demand meter on the pad-mounted service transformer. Verify exact requirements with DEL Operations POC, George Springer, 804-734-3167.

4-15.8 Engine Generator Set. Provide a complete packaged natural gas emergency generator set sized to supply the combined phase 1 and phase 2 electrical power load plus 15 percent spare capacity. Unit shall be sized to start the building motor loads without objectionable voltage dip. Generator set shall be sized to supply the 3-phase power load for phase 1 and 2 areas for periods of up to 72 hours continuously. The generator set shall be housed in an outdoor weatherproof enclosure suitable for the ambient conditions at the building site. Gen-set shall include all necessary accessories and auxiliaries for proper operation including fuel, cooling, protective, instrumentation, control, automatic starting including necessary controls, battery and charging system, generator main breaker, starting aids, intake and exhaust silencers and

electronic governor. Provide plenum to direct radiator and exhaust discharge vertically. Exhaust silencer shall be the quiet residential grade type. Voltage regulation shall be +/- ½% steady state. Voltage waveform harmonic distortion shall be less than 5%. Provide flush mounted remote monitoring panel in reception area to monitor operational and alarm status of the engine and generator. Generator set shall be configured to start and assume load within 10 seconds of loss of utility power.

4-16 **TELEPHONE SITE WORK**. All exterior communications design shall be coordinated with the Directorate of Information Management (DOIM). [Jerome Boyd, (804) 734-7500, boydj@lee.army.mil or Harless Dobbins, (804) 734-7366, dobbinsh@lee.army.mil], Design analysis shall include meeting minutes of coordination effort.

4-16.1 **Outside Plant**

4-16.1.1 **Manhole Duct System -** Provide 4- 4" conduit from comm. manhole A3A located on Adams Avenue to the FESC Phase 1 building communication room. One duct shall contain 4-1" inner-ducts (for fiber optic cable). A second duct shall contain copper cable. All unused ducts shall have a pull cord installed for a later requirement. Core drill existing manhole for placement of conduit. Cable shall be racked on the walls and supported in the manhole.

4-16.1.2 **Requirements at Building 1109 –** Provide modification to existing Main Distribution Frame (MDF) for supporting connection of outside plant cable to inside plant cable/equipment in building 1109 telecommunications room.

4-16.1.2.1 **For Telephone –** Provide 600 pair, 24 AWG copper cable, (with 50' tails) in conduit in communication service entrance room of building 1109. Provide and terminate 600 pair cable on new Protected Building Entrance Terminals (PBET), patch panel 110-type connecting block [i.e. Reliance Com/Tec R399 Connector 100-pair (6ea.)]. Perform all splices and cross connects. Contact DOIM to perform cross connect to patch panel.

4-16.1.2.2 **For Data:** Provide 24 strand single-mode fiber optic cables (FOC) in 1" inner-duct conduit for termination in building 1109 and at FESC building. Provide Light Interface Unit for termination of FOC on patch panel. FOC connectors shall be "ST" type, in 6-pack.

4-16.1.2.3 **Requirements at Fire and Emergency Services Center Building**

4-16.1.2.4 **Telecommunications room** shall be sized in accordance with EIA/TIA 569 guidance for administrative commercial buildings.

4-16.1.2.5 Cable Support – Provide cable tray for management/distribution of cable in communication room.

4-16.1.2.6 Termination of Cable

4-16.1.2.6.1 Telephone Cable – Provide plywood backboards, (8'x4'x3/4" with two coats of fire retardant paint), and Protected Building Entrance Terminals with gas modules for termination of outside plant 600-pair cable. The contractor shall install and terminate 200 pair cable on patch panel 110-type connecting block. The other 400 pair cable will be used to support later phases of the project.

Data FOC – Provide Light Interface Unit for termination of FOC cable. Provide 19" enclosed LAN cabinet for termination of FOC on patch panel. Category 6 patch cord FOC connectors shall be "ST" type, in 6-pack

4-17 **CATHODIC PROTECTION**. Cathodic Protection (CP) is mandatory on buried ferrous metallic structures as described below:

4-17.1 Department of Transportation guidance. Shall be as stated in 49 CFR, Part 192, requires that all metallic natural gas piping be coated and cathodically protected regardless of the soil resistivity.

4-17.2 Design requirements. CP systems must be designed to provide protective potential to meet the requirements of the National Association of Corrosion Engineers (NACE) Standard RP-0169, Control of External Corrosion on Underground or Submerged Metallic Piping Systems, or NACE Standard RP-0185, Control of External Corrosion on Metallic Buried, Partially Buried, or Submerged Liquid Storage Systems, as appropriate. Design shall be accomplished by a certified NACE specialist or registered engineer specialized in corrosion control.

4-17.3 Compatibility. New or supplemental CP systems shall be compatible with existing CP systems and other adjacent structures or components. New systems should be compatible with existing systems to allow ease of repair and maintenance.

4-17.4 Tracer wire. When plastic pipe is used to extend a steel gas distribution main, an insulated No. 8 AWG copper wire shall be exothermically welded to the existing steel main and run the length of the new plastic main. This wire can be used as a locator tracer wire and to maintain continuity to any future steel gas main extension.

4-17.5 Coatings. CP and protective coatings shall be provided for the following buried and submerged ferrous metallic structures regardless of soil or water resistivity.

4-17.5.1 Natural gas piping.

4-17.5.2 Fire protection piping.

4-17.5.3 Ductile or cast iron piping. Required for pressurized piping under floor (slab on grade) in soil.

4-17.5.4 Conduit piping systems. Required for underground chilled water piping in ferrous metallic conduit.

4-17.6 Cast iron pipe. Shall be treated as follows:

4-17.6.1 Below 10,000 Ohm-cm: For soil resistivity below 10,000 Ohm-cm at pipeline installation depth, provide CP, bonded joints, and protective coatings.

4-17.6.2 Between 10,000 and 30,000 Ohm-cm: For soil resistivity between 10,000 and 30,000 Ohm-cm at pipeline installation depth, provide bonded joints only.

4-17.7 Copper water service lines: Piping will be dielectrically isolated from ferrous pipe. Dielectric isolation shall conform to NACE RP-0286.

4-17.8 Ductile iron piping systems: Conduct an analysis (except for ductile iron piping under floor in soil) to determine if CP and/or bonded or unbonded coatings are required. Unbonded coatings are defined in ANSI/AWWA C105/A21.5.

4-17.9 Economic analysis: Conduct an economic analysis to determine if CP and protective coatings should be provided for gravity sewer lines and the following structures in soil resistivity conditions above 10,000 Ohm-cm:

4-17.10 Potable water lines.

4-17-11 Other structures. Buried and submerged ferrous metallic structures not covered above.

4-17.12 Contact with concrete. Ferrous metallic piping passing through concrete shall not be in contact with the concrete.

4-18 CABLE TELEVISION SYSTEM (CATV) Provide empty 4" conduit with pull wire from Phase 1 Communication Room to Telemedia CATV pedestal located along Adams Avenue. See site plan.

4-19 ROADWAY TRAFFIC SIGNAL SYSTEM. Provide traffic signal system at entrance to Adams Avenue from the FESC. Design and construct the system to meet the latest editions of the Manual on Uniform traffic Control Devices (MUTCD) and Virginia Department of Transportation (VDOT) Road and Bridge Standards and Specifications. Signal shall be in accordance with Chapter 4F and installed in accordance with Chapter 4D of the MUTCD. Signal operation for the emergency signal shall be per Sect 4F.03 for mid-block locations. Signal time for the steady red shall be based upon trial exit times for the station and will be determined based on the Fire Chief's determination of adequate exit time. Red and steady yellow shall have 12" lenses. Green and flashing yellow may be 8" lenses. Provide an R10-13 sign (emergency signal) mounted on the signal arm adjacent to signal face. Signal poles shall be VDOT types MP-1 with type PF-1 foundation. Type PF-2 may be used for signal heads controlling movement from the FESC. Signals shall be clearly visible for A-Avenue traffic and from all FESC A-Avenue apparatus bay doors. Provide manual control stations with timing function at the FESC for signal system control. Provide an Emergency signal ahead (W11-8) with a supplementary W11-12P Plaque at each approach to the emergency signal.

CHAPTER 5

ARCHITECTURAL DESIGN

5-1 DESIGN GOALS. Overall architectural goals for the facility are to provide a functional, visually appealing facility that is a source of pride for facility users and the installation. Materials shall be a high quality and low maintenance.

5-1.1 Site Planning Objectives. Provide a pedestrian-oriented site. The site should create a sense of community and enable visitors to readily identify the facility. Integrate sustainable design principles by retaining and using existing topography to advantage; preserve as many trees as possible and reduce overall project impact on the site.

5-1.2 Exterior Design Objectives. Design building to enhance the visual environment of the installation. Drawings included in the RFP identify the architectural character of the building. The D-B Contractor shall continue that concept into a final design and facility construction. Exterior materials, roof form, and detailing shall comply with the RFP, Installation Design Guide, and shall be compatible with the immediate local context. Use durable, low-maintenance materials.

5-1.3 Interior Design Objectives. Drawings included in the RFP identify the arrangement, relationships, and size of rooms within the facility. Use durable materials and furnishings that can be easily maintained and replaced. Use interior surfaces that are easy to clean and light in color; avoid trendy or bright color schemes. Structure interior construction to allow maximum flexibility for future modifications.

5-1.4 Material and Product Selection Criteria. Materials shall meet the requirements of the RFP. The RFP includes specific materials to be used. The RFP requirements establish a minimum quality level. Higher quality materials will be judged more favorably. The Offeror's proposal shall clearly identify any improvements over the minimum requirements.

5-2 APPLICABLE CODES AND STANDARDS. Except as specified otherwise in the RFP, design and construction of the FESC facility shall comply with the latest editions (as of the date of the RFP) of the following. Major criteria references for building design are listed below; additional requirements are included throughout the RFP. Refer to Appendix A for a list of criteria references, and sources of availability.

5-2.1 National Fire Codes, published by the National Fire Protection Association (NFPA), including NFPA 101 Life Safety Code.

5-2.2 UFC 1-200-01 Design: General Building Requirements, which includes portions of the International Building Code (IBC).

5-2.3 Federal Std 795 Uniform Federal Accessibility Standards (UFAS), and Americans With Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG). Where these criteria conflict, the most stringent requirement shall apply.

5-2.4 Antiterrorism / Force Protection Standards; USC 4-010-01

5-2.5 The Fort Lee Installation Design Guide (IDG)

5-2.6 Military Handbook MIL-HDBK-1008C

5-3 OCCUPANCY AND BUILDING TYPE CLASSIFICATIONS.

5-3.1 General. Occupancy classifications, construction types, allowable areas, maximum building heights, and fire separation requirements shall comply with the requirements of the International Building Code.

5-3.2 Facility Classification. Occupancy classification: Business Group B-1. Hazard Classification: Ordinary Group

5-3.3 Construction Type: Type II Non-combustible per UBC. Full coordination with code shall be the responsibility of the D-B Contractor.

5-4 BUILDING DESIGN.

5-4.1 Acceptable Materials and Colors. Exterior elements of the facilities shall comply with the Installation Design Guide (IDG) unless required otherwise by applicable codes or this Statement of Work.

5-4.2 Exterior Walls. Comply with Statement of Work. Exterior walls shall be Precast masonry units and brick masonry. Exterior insulation finish systems shall not be used.

5-4.3 Roofs. Sloped roofs shall be 4/12 slope and as indicated on the drawings included in this RFP unless otherwise noted. Roofing material and color shall comply with this RFP and the IDG. Roofing system shall have Underwriters Laboratory (UL) Class A rating for fire resistance, UL 90 wind resistance rating, and Factory Mutual (FM) 1-90 fire and wind resistance rating.

5-5 MATERIALS. All materials and products shall be installed in accordance with the RFP, code and the manufacturer's instructions. The following materials shall be used in construction of the facility:

5-5.1 This section not used.

5-5.2 Site materials

Soil Treatment For Subterranean Termite Control. Soil shall be treated for termite protection below the slab and around the perimeter of the building. The pesticide applicator shall be state certified by the Environmental Protection Agency. Treatment shall carry a 5-year non-prorated warranty and include annual inspections and any required re-treatment during the warranty period.

5-5.3 Concrete

Precast concrete units shall be designed and fabricated by an experienced and acceptable precast concrete manufacturer certified under the PCI Plant Certification Program and shall be regularly engaged in the production of architectural precast concrete. Precast shall be reinforced and shall be designed to carry the appropriate loads. Concrete shall use white cement, be an approved color, and have a light sandblasted finish. Color shall match the Modular Precast concrete masonry units.

5-5.4 Masonry

Brick shall be severe weather rated, ASTM C 216/652, equal to Lawrenceville 3-115, no blend, and modular size with colored mortar to match the Precast units.

Concrete masonry units shall be ASTM C 90 and used as indicated on the plans, may be lightweight units, shall have grout filled cells, and shall be reinforced with joint reinforcing and steel bars as required. Concrete masonry lintel units shall be used over openings in CMU walls.

Masonry work shall comply with the Brick Institute of America and American Concrete Institute guidelines. Masonry shall be anchored to the structure with galvanized adjustable wall ties secured to studs. Steel lintels shall be painted hot dipped galvanized steel. All masonry at windows and doors shall be flashed with a flexible metal flashing.

Modular Precast units shall be ASTM C 1364 a precast masonry product and used as indicated on the plans, shall have a compressive strength of >6500psi and be ASTM C1194, shall have an absorption of <6% and be C 1195, and shall have a density of >120 lbs. per cu. ft. and be ASTM C140. Modular Precast units shall be 3-5/8”x7-5/8”x23-5/8” and color to be equal to Reading Rock, Rockcast, “Crème Buff”, with colored mortar to match the Precast units.

5-5.5 Metals

Metal Framing

Metal studs and joist shall be 16 gage minimum meeting ASTM A 653, SS Grade 50. Studs shall be spaced 16” o. c. Design framing in accordance with AISI SG-673. Provide design data confirming gage and spacing. Deflection shall not be greater than L/600 for walls supporting masonry or L/240 for roofs. See the Structural Chapter for additional requirements.

Miscellaneous Metal

Pipe Guards shall be heavy duty 6” diameter x 48” tall galvanized steel pipe filled with concrete and have a prefinished domed top, and set 36” deep in 12” diameter concrete. Finish with paint to match Modular Precast units.

Access doors shall be galvanized steel and provided in walls and ceilings for all plumbing valves, cleanouts, and mechanical systems. Doors shall be painted to match adjacent surfaces. Doors shall be rated when located in a rated assembly.

Entry Mat. Recessed type, dirt-hiding construction, classified for heavy commercial traffic. Construction shall be clear aluminum slats with vinyl or rubber inserts. Slats shall interlock. Mat shall have a rigid extruded aluminum frame on all sides of the floor opening to receive the mat.

Fire Extinguisher Cabinets & Fire Extinguishers. Cabinets shall be semi-recessed, stainless steel case and frame with a clear glass front. Cabinets and extinguishers shall be provided as required by code. Extinguishers may be wall mounted in service areas only.

Expansion Control Joint Covers shall be stainless steel. Exterior joints shall be sealed from the water and air infiltration. floor joints/covers shall be flush with the floor finish.

5-5.6 Wood

Rough Carpentry

Wood blocking shall be pressure treated with preservative treatment. Wood shall be treated in accordance with AWPA C2/C9 for .40 pcf.

Fire retardant treatment shall be provided where required. Wood shall be treated in compliance with AWPA C20/C27.

Exterior Sheathing. Exterior stud framing shall be sheathed with a moisture resistant, fiberglass faces –gypsum sheathing board. All vertical joints shall be taped. Sheathing shall be covered with an infiltration barrier such as Tyvec. All openings shall be flashed with a rubberized membrane such as WR Grace Bituthane.

Finish Carpentry

Chair Rail. Provide 2 ½" x ¾" solid oak wood, finish and shape to coordinate with wall base.

Wood Base. Shall be of same finish and character as moldings used on fixed walls and movable walls. Wood base shall be stained oak wood. Base shall be beveled or shaped, minimum of 4" x ¾".

Shelving shall be plastic laminate covered ¾" plywood unless otherwise indicated.

Solid Polymer Fabrications

Solid polymer material shall be cast, 100% acrylic solid homogeneous filled solid polymer. Superficial damage to the surface shall be repairable by sanding and/or polishing. Material shall be a minimum of ½" thick. Material shall have a 10-year warranty. Counter tops with integral lavatory bowl shall be one piece.

5-5.7 Thermal and Moisture Protection

Dampproofing

Dampproofing on masonry shall be fibrous asphalt, in accordance with ASTM D 4479.

Insulation

Thermal Insulation. Provide exterior wall, floor, and roof/ceiling assemblies with thermal transmittance (U-values) required to comply with code and this RFP. Insulation shall not be installed directly on top of suspended acoustical panel ceilings.

Perimeter slab insulation shall be unfaced preformed rigid polyurethane, ASTM C 591.

Vapor Retarder shall be provided below slabs, have a 0.2 Perm or less rating in accordance with ASTM E 96.and 40-pound minimum puncture resistance rating in accordance with ASTM E 154. Where wall insulation is un-faced, provide 6-mil polyethylene film. Provide vapor barriers in concealed space that meet flame spread and smoke development ratings as required by code.

Metal Roofing

Roof system shall include the entire roof system in accordance width ASTM E 1592. The system shall be a complete standing seam metal roof system consisting of finished, factory formed panels, fasteners, slip sheet, insulation, vapor retarder, all accessories, components, and trim. The installer shall be certified by the roof system manufacturer. Roofing system shall have Underwriters Laboratory (UL) Class A rating for fire resistance, UL 90 wind resistance rating, and Factory Mutual (FM) 1-90 fire and wind resistance rating. Roof panel and trim shall have no exposed fasteners. Roofs shall

have snow guards located at entrances, exits and sidewalks and shall be mechanically attached (without penetrations) to metal roof ribs. Provide soffit/ridge ventilation where required by the design. Vents through the roof shall not be on the front of the building. Design to include sufficient venting for Apparatus Bays high gable roof.

Metal Roofing. Roof shall be standing seam metal roof. Provide manufacturers 20-year premium Kynar based paint (or approved equal) finish warranty. Color shall be bronze in accordance with the Installation Design Guide. Roof panels shall be Galvalume or approved equal metal. Seams shall be mechanically seamed. Provide minimum 30# felt underlayment. Provide self-adhering rubberized ice and water shield underlayment at all valleys, ridge caps, flashing and roof perimeter.

Roof insulation shall be polyisocyanurate conforming to ASTM C 1289, Type II, with an aged R-value equal to that indicated on the drawings. Facings and sheathing shall be provided as required.

Exterior Canopies

Canopies shall match building and roof construction. Columns are to be finished walls on all 4 sides. Prefinished metal soffits shall be 12” wide perforated metal panels. Soffits shall contain recessed lighting.

Flashing and Sheet Metal

Trim and Flashing. Materials and colors shall comply with the requirements of IDG and this RFP. Gutters, downspouts, fascias, soffit, and trim shall be prefinished metal to match the roof; comply with SMACNA Architectural Sheet Metal Manual; provide 20-year manufacturers finish warranty trim and flashing shall be at least 26 gauge Galvalume metal or approved equal in compliance with ASTM B 209 with Kynar based paint finish or approved equal, smooth finish, with no exposed fasteners. Soffits other than entry canopies shall be flush panels. Continuous wood backing shall support fascia. Metal trim and flashing shall be produced in the maximum practical lengths but in no case less than ten feet long. Trim shall be flat with no oil canning or waves. All exposed flashing must match the roof color.

Fire Stopping

Fire stopping systems shall be used where required by code to maintain the integrity of fire resistance rated walls, partitions, etc. All material shall be asbestos free. “F” and “T” fire resistance ratings in accordance with ASTM E 814 or UL 1479 shall be met.

Joint Sealant

Sealant. Sealants shall be compatible and as recommended by the manufacturer of the items being sealed. Sealant at masonry shall be a one or two part urethane and shall closely match the color of the material. Sealant at window and doorframes shall be a one or two part urethane and shall closely match the color of the frame material. Interior joint sealant shall be silicone and be clear or match the surface being sealed. Compatible primers and backer rods shall be used with sealant. Sealant in STC rated partitions at the intersection of walls and ceilings shall be acoustic sealant.

5-5.8 Doors and Windows

Steel Doors and Frames- See Finish/Door Schedule.

Exterior Service Doors. Exterior doors and frames opening to spaces other than corridors or lobbies shall be insulated (R-5) hollow metal; comply with ANSI A250.8/SDI 100. Doors shall be Level 3, physical performance Level A, Model 2; insulated; top edge closed flush with continuous welds. Frames shall be Level 3, 14 gauge, with continuously welded corners and seamless face joints. Doors and frames shall be constructed of hot dipped zinc coated steel sheet, complying with ASTM A653,

Commercial Steel, Type B, minimum A40 coating weight; factory primed. Anchors (minimum 3 per jamb) and accessories shall be zinc coated. Frames in masonry shall have bituminous back-coating, plaster guards, and shall be grouted solid. Fire-rated openings shall comply with NFPA 80 and 101, and the requirements of the labeling authority.

Interior Hollow Metal Frames. Comply with ANSI A250.8/SDI 100. Frames shall be Level 2, 16 gauge, with continuously welded corners and seamless face joints; factory primed. Anchors and accessories shall be zinc coated. Frames in masonry shall have bituminous back-coating, plaster guards, and shall be grouted solid. Frames at masonry walls shall be grouted solid. Frames shall be wrap around type at all walls.

Fire-rated and Smoke Control Doors and Frames. Comply with International Building Code (IBC), NFPA 80, and requirements of labeling authority. Doors and frames shall bear labels from IBC approved testing laboratory. Comply with positive pressure testing requirements of IBC.

Aluminum Doors and Frames- See Finish/Door Schedule.

Entrance Doors. Doors opening to building corridors or lobbies shall be aluminum storefront doors and frames with Architectural Class I anodic finish or AAMA 2605 organic coating finish. Color shall comply with IDG. Doors shall be minimum 1-3/4" thick. Fully glazed stile and rail doors shall be medium stile. Provide aluminum storefront systems that comply with wind load requirements of applicable codes. Framing systems shall have thermal-break design. Air infiltration shall not exceed 0.06 cubic feet per minute per square foot at 6.24 pounds per square foot in accordance with ASTM E 283. Water penetration shall not exist at a pressure of 8 pounds per square foot in accordance with ASTM E 331.

Wood Doors- See Finish/Door Schedule.

Wood Doors. Provide flush wood solid core acoustical doors complying with National Wood Window and Door Association (NWWDA) I.S.-1A. Doors shall be constructed to provide Sound transmission rating of 35 or the STC rating of walls indicated, when tested in accordance with ASTM E 90. Stile edges shall be non-finger jointed hardwood compatible with face veneer. Provide American Woodwork Institute (AWI) Grade A hardwood face veneer for transparent finished doors. Provide solid core, Type II flush doors with faces of sound grade hardwood where acoustic doors are not required. Finish shall be premium grade oak, clear urethane. Doors shall have a lifetime performance warranty.

Fire-rated and Smoke Control Doors and Frames. Comply with International Building Code (IBC), NFPA 80, and requirements of labeling authority. Doors and frames shall bear labels from UBC approved testing laboratory. Comply with positive pressure testing requirements of UBC.

Apparatus Bay Doors

Hydraulic Four Fold Door. Apparatus Bay Doors with 14'-0" x 14'-0" clear opening shall be equal to Electric Power Door "Hydraulic Four Fold Door". Doors shall be mounted on the interior. They shall not have floor tracks, shall require no more than 12" of clear space above the opening, shall be power operating at 2 feet per second, have manual operation override, and be insulated with 2" fiberglass insulation and weather stripped. The doors shall be structurally framed door panels that are sheeted on both sides with hot dip galvanized 14-gauge flat steel finish painted (to match window Bronze). Each door leaf will include two (2) 24" x 36" windows with frames. Glass shall be a minimum of 1/4" clear tempered laminated glass with .030PVB and 1" stops holding the glazing in place. All necessary hardware shall be included for a fully

operational folding door. Doors shall have a safety device that stops the doors from closing when objects are in the door opening. Two (2) master control stations with controls for all the doors shall be located at the sidewalls of the Apparatus Bays (see drawings). One three-pushbutton door control station mounted beside the door at the exterior wall for each door. Door control stations shall be safely accessible while operating controls and opening or closing the doors. See electrical chapter 9 for electrical requirements.

Aluminum Windows

Exterior Windows. Provide aluminum windows complying with American Architectural Manufacturers Association AAMA/NWWDA 101 / I.S. 2. Minimum performance class shall be Heavy Commercial (HC). Minimum wind load, and resulting design pressure and performance grade shall be determined in accordance with the International Building Code (IBC). Provide windows with insulating glass and thermal break necessary to achieve a minimum Condensation Resistance Factor (CRF) of 45. Finish shall be AAMA 2605 organic paint coating. Windows must be designed and installed to meet the Department of Defense minimal threat level as identified in the Interim Force Protection Standard.

Door Hardware- See Finish/Door Schedule for door hardware requirements. Hardware shall be fire rated to match door requirements.

Exterior Door Finish Hardware.

Finish. Hardware finish shall be polished stainless steel or chrome plated non-ferrous metal.

Hinges. ANSI/BHMA A156.1; template, full mortise, heavy duty, ball bearing, minimum size 4 ½" x 4 ½ ", non-ferrous base metal, non-removable pins.

Locksets on Exterior Doors. ANSI/BHMA A156.13; mortise lockset with removable core; non-ferrous base metal. Provide Best Locks and cylinders.

Cipher/Combination Lock.

Mechanical type. Doors shall be accessed from the exterior by heavy duty, mechanical combination lockset with five pushbutton, standard size door handle, ¾" deadlocking latch. Inside lever handle shall always activate the latch. Provide a keyed removable cylinder on the interior for setting the combination. Provide a keyed removable core on the exterior to allow bypassing the combination. Provide a thumb turn on the interior to activate passage set function, so the outside lever operates latch without using the combination.

Digital type. Doors shall be accessed from the exterior by heavy duty, electric powered combination lockset with five pushbutton, standard size door handle, ¾" deadlocking latch. Inside lever handle shall always activate the latch. Should be same in appearance as mechanical lock and same manufacturer. To admit a visitor from outside of secure door, a Code Bypass capability shall enable personnel to unlock the door electronically from a control inside the Reception Room122 without entering a code in the push button panel. Provide both indoor and exterior type 5 push-button panels, battery standby, and flexible settings for adjustable door open times.

Exit (Panic) Devices. ANSI/BHMA 156.3; heavy-duty touch-pad type, through-bolted mounting. Listed and labeled for panic protection based on UL 305.

Closers. ANSI/BHMA A156.4; series C02000, Grade 1, hydraulic, factory-sized, adjustable to meet field conditions. Provide for all exterior doors, all doors opening to corridors and as required by codes. At exterior doors to lobbies, corridors, mechanical rooms, janitor's closets, and storage areas provide overhead holders or closers with hold-open capability. Store front doors shall have concealed closers. Exposed closers

shall have covers painted to match hardware.
Auxiliary Hardware. ANSI/BHMA A156.16. Provide wall or floor stops for all exterior doors that do not have overhead holder/stops. Provide other hardware as necessary for a complete installation.
Thresholds. ANSI/BHMA A156.21; non-ferrous metal. Provide at all exterior doors.
Weatherstripping. ANSI/BHMA A156.22. Provide at all exterior doors.

Interior Door Finish Hardware.
Finish. Hardware finish shall be polished stainless steel or chrome plated non-ferrous metal.
Hinges. ANSI/BHMA A156.1; template, full mortise; heavy duty, ball bearing on doors with closers; standard duty anti-friction bearing on doors without closers. Minimum size 4 ½" x 4 ½ ".
Locksets on Interior Doors. ANSI/BHMA A156.2; series 4000, Grade 1, non-ferrous base metal, removable core. Provide Best Locks and cylinders
Exit (Panic) Devices. ANSI/BHMA 156.3; heavy-duty touch-pad type, through-bolted mounting. Listed and labeled for panic protection based on UL 305.
Closers. ANSI/BHMA A156.4; series C02000, Grade 1, hydraulic, factory-sized, adjustable to meet field conditions. Provide as required by codes and as indicated in the Finish/Hardware Schedule. Store front doors shall have concealed closers. Exposed closers shall have covers painted to match hardware.
Auxiliary Hardware. ANSI/BHMA A156.16. Provide wall or floor stops for all doors that do not have overhead holder/stops. Provide other hardware as necessary for a complete installation.
Sound Strip. ANSI/BHMA A156.6; non-ferrous metal. Provide as required for sound rated partitions/spaces.
Vision Panel. ANSI/BHMA A156.6.
Kick Plates. ANSI/BHMA A156.6; non-ferrous metal. Provide at all doors with closers and as required for door protection.
Threshold/Transition. Use floor finish transition strips when floor finish changes between rooms. Locate strip below door.
Keying. Keying shall be coordinated with the Owner Keying system shall match the installation standard using Best Lock cores. A grand Master keying system shall be used for interior and exterior locks at the facilities. Each private door shall have it's own individual keying. Provide 3 copies and 3 spare blanks for each key. All keys shall be stamped "Government Property- Do Not Duplicate". Provide a 150-hook key control cabinet for the Owner's locksmith. Label each key by room. Final keying and cores shall be sent to the Owner for his installation and not used or distributed by the Contractor.
Louvers. Door louvers shall be coordinated with the HVAC system and ventilation requirements. Provide louvers for bathrooms, janitor's closets, laundry rooms, and as required for the Mechanical design. All louvers shall be non-vision type. Wood louvers shall be provided in wood doors and steel louvers in Hollow metal doors. Comply with International Building Code (IBC), NFPA 80, and requirements of labeling authority as required for fire rated doors.

Wood Louvers. Solid wood louvers shall be factory installed by wood door manufacturer. Wood louvers to be matching specie and finish as the doors in which they occur. Wood slats shall be not less than 3/16" thick. Stiles shall be routed out to receive slats. Secure wood louvers in prepared cutouts with wood stops.

Steel Louvers. Steel louvers shall be 16 ga. cold rolled steel louver frame, and 22 ga. cold rolled steel louver blades. Corners shall be tight mounted with no visible welds, and the corridor side of the door shall be free of fasteners. Steel louvers shall be matching finish as doors in which they occur.

Glazing

Exterior Glass and Glazing. To comply with force protection minimum standards: Single glazing and the inner pane of insulated glass assemblies in exterior windows and doors shall be minimum 1/4-inch annealed laminated glass. All exterior glazing shall be insulated clear glass. Insulated glass shall have a reflective coating on the number 2 face. Units shall conform to ASTM E 774, Class A.

Interior Glass and Glazing. Glazing in doors, sidelights and interior windows shall be a minimum of ¼" thick and meet the requirements of IBC and Life Safety Code. Interior glazing shall be Type I, Class 1, clear unless noted otherwise.

5-5.9 Finishes

Metal Framing

Metal Support Systems. Non-load bearing metal studs and furring shall comply with ASTM C 645; stud gauge shall be as required by height and loading, but shall not be less than 20 gauge. Steel shall be galvanized coated in accordance with ASTM A 653, Z180 G-60. Maximum stud spacing: 16" on center. Provide galvanized finish at all exterior walls. Provide loading calculations for all load bearing framing.

Gypsum Board

Gypsum Board. Comply with ASTM C 36. Minimum panel thickness: 5/8". Provide Type X panels in fire-rated assemblies. Provide moisture resistant panels at locations subject to moisture and comply with ASTM C630. Screws ASTM C 646. Drywall installation: ASTM C 840. Sealant in acoustic rated partitions at the intersection of walls and ceilings shall be acoustic sealant.

High Impact gypsum board shall be used as indicated in the finish schedule. It shall resist a force of 250 foot-pounds in compliance with ASTM D 2394.

Acoustic or fire rated partitions shall extend from the floor to the underside of the rated floor or roof and shall be sealed with smoke stop or fire stop as required by code. Provide metal access panels in walls, floors or ceilings at all plumbing fixtures, cleanouts, valves, etc.

Gypsum Board Ceilings. Gypsum board or plaster ceilings shall be installed in accordance with the US Gypsum handbook. All gypsum board shall be at least 5/8" thick and supported on framing spaced no greater than 16" on center. Gypsum board shall not be finished with spray-applied texture.

Uniform Finish. All gypsum board surfaces shall be finished in accordance to GA 214 Level 5.

Cementitious Backer Units shall comply with ANSI A118.9. Where cementitious backer units are used, a moisture barrier shall be used behind the units.

Ceramic Tile

Ceramic Wall Tile. Smooth or textured glazed wall. Comply with ANSI A 137.1 and the recommendations of Tile Council of America (TCA) Handbook For Ceramic Tile Installation. Substrate for wall tile shall be mortar setting bed or cement backer board (gypsum board is not acceptable). Tile shall be standard grade and containers should be grade sealed. Tile shall be impact resistant with a minimum breaking strength for wall tile of 90 lbs in accordance with ASTM C 648. Wall tile shall be 4" x 4" or larger.

Ceramic Floor Tile. Impervious mosaic tiles with less than 0.5 moisture absorption. Tiles to be colored throughout with an unglazed, non-slip finish and cushioned edge; suitable for heavy traffic. Provide base of same or suitable material. Comply with ANSI A 137.1 and the recommendations of Tile Council of America (TCA) Handbook For Ceramic Tile Installation.. Tile shall be impact resistant with a minimum breaking strength for floor tile of 250 lbs in accordance with ASTM C 648. Floor tile shall be Class IV heavy traffic, durability classification as rated by the manufacturer when tested

in accordance with ASTM C 1027 for abrasion resistance as related to foot traffic. Tile shall be standard grade and containers should be grade sealed. Provide marble threshold under doors where a ceramic tile floor meets a different floor finish. Floor tile shall be 2” x 2” or larger.

Installation. Showers shall be per TCA B414-99, shower ceilings shall be per TAC C311-99, floors shall be per TAC F112-99, and walls shall be per TAC W244-99 or W245-99.

Porcelain Floor Tile

Tile shall be an impervious porcelain paver with granite look finish. Tile shall be at minimum 8”x8”. Install on a thick mortar bed as indicated for ceramic tile. Provide colored grout. Floor tile shall be Class IV heavy traffic, durability classification as rated by the manufacturer when tested in accordance with ASTM C 1027 for abrasion resistance as related to foot traffic.

Acoustical Ceilings

Ceiling Tile. Comply with EPA requirements in accordance with Section 01670 Recycled/ Recovered Materials. Acoustical units shall conform to ASTM E 1264, Class A.

Suspended Acoustic Ceilings. Ceiling grid shall be white painted aluminum in damp areas. Other grids may be electro-coated steel. Acoustic panels shall be 2’ x 2’ x ¾” thick, reveal edge, fissured pattern, washable, white, through color panels.

Resilient Flooring

Transition between floor finishes shall be below the doors. Transitions shall be stone at tile floors and metal at vinyl or carpet. Following installation protect all finishes from construction work.

Epoxy Flooring

Epoxy flooring shall be non-slip and non-skid chemical resistant type floor coating. Floor to be impervious to fuels (diesel fuel, JP-4, and JP-8), to fire fighting chemicals, and to various automotive lubricants. The floor should not be affected by the weight of a vehicle or be subject to being pulled by the apparatus tires when operational.

Colored Concrete Flooring

Colored Concrete flooring shall be concrete with intergral color. Provide LM Scofield or equal for colors.

Carpet

Carpet. Loop pile, (cut pile as indicated in finish schedule) patterned, yarn dyed, tufted pile weight shall be 28.0 ounce per square yard. Finished pile height shall be .187” high, density 6,462 and 14 stitches per inch. Large dye lot capacity with clear, crisp colors. Primary backing shall be woven polypropylene and a high performance secondary backing system. Manufactured from permanent static control fiber, stain resistant, and direct glue-down installation is mandatory for limiting acoustical absorbency of floor surface. Transition strips shall be dark metal securely fastened to the slab.

Corner Guards shall be provided at all corridor corners. Guards shall be high impact resistant aluminum with embossed rigid vinyl covers to match the wall finish.

Paint

Paint colors shall be selected by the Owner from the Contractors submittals. Paint shall

not contain lead, chromate, asbestos or mercury.

Surfaces to be Painted. All unfinished surfaces and factory-finished surfaces exposed to the view of the public (wall, ceiling or roof mounted items) shall be painted. Walls shall be painted to 4" above the finished ceiling.

Coatings. All painted surface shall be primed and receive a minimum of 2 coats of paint. Finish coat shall provide complete coverage. Painted masonry shall also receive block filler after block has been cleaned and accepted by the Owner.

Types of Paint. The following types of paint shall be used where indicated.

Exterior Alkyd Enamel-	Exterior doors, frames, misc. items.
Interior Alkyd Enamel-	Interior doorframes and metal items.
Interior Latex Enamel-	All other interior surfaces.
Latex Block Filler-	Any masonry or concrete to be painted.
Interior Latex Primer/Sealer-	Interior gypsum, masonry, plaster surfaces.
Interior Oil Based Primer-	Interior metal surfaces.

Gloss levels. The following gloss levels shall apply to all surfaces-

Flat-	Ceilings.
Eggshell-	Walls, doors, misc. items.
Semi-gloss-	Handrails, guardrails, doorframes.

Wainscot Covering. Provide painted wainscot finish equal to Pittsburgh Paint high performance "Pitt-glaze" coating. Comply with manufacturer's instructions for optimum performance.

Window Stools

Window Stools. Provide window stools of ¾" solid polymer fabrications surfacing material.

5-5.10 Specialties

Visual Communication Specialties

Whiteboard/Markerboard. Markerboard shall have a porcelain enamel writing surface and chalktray. It shall be a factory assembled unit complete in one piece, without joints whenever possible. Frame and chalktray shall be clear finish aluminum. Chalktray shall extend the full length of the liquid markerboard. Markerboard shall include a map rail with a tackable insert and shall have map hooks with clips for holding sheets of paper. Dry erase markings shall be removable with a felt eraser or dry cloth without ghosting. Unit shall come complete with an eraser and four different color compatible dry erase markers.

Entry Mats

Recessed Entry Mats. Provide a minimum 6'x 8' recessed entry mat centered between vestibule walls and one course of corridor floor materials from exterior doors. Provide corridor floor finish for perimeter of remaining floor. Provide rail and frame type, C/S Group Pedimat-Black carpet strips #7324 Gunmetal or equal.

Toilet Partitions

Toilet Partitions. Solid polyethylene, floor supported. Reinforce panels to receive partition-mounted accessories.

Urinal Screens. Solid polyethylene, wall hung. Secure wall hung screens with 42" long, continuous flanges. Screens shall be manufacturer's standard size approximately 48" tall and 24" deep.

Metal Louvers

Wall louvers shall be extruded aluminum, storm proof louvers, finished to match the metal windows, and include insect screen. Intake louvers shall be located 10 feet above grade. Finish shall be Kynar based paint.

Exterior Lighting

Architectural wall mounted lights. Wall mounted lights at exterior wall of Apparatus bays shall be 22", Teron, Odyssey W, Steel housing Bronze colored, with (1) 42 W Lamp and (2) 50 W Up/Down lamps. Model ODYW-F142X-120E-BT-41K.

Exterior Signage

Exterior Signage. Comply with IDG Design Guide and the photograph in the RFP attachment. A brick masonry sign with individual bronze dimensional letters shall be provided near the site entrance identifying the facility. This sign shall be illuminated with an in-ground, flush mounted spotlight. See attachment for example design. Provide additional site signage for handicapped accessible parking and traffic control. Provide an "Emergency and Fire Protection Vehicles Only" sign at each side of the drives leading to the Apparatus Bays.

Interior Signage

Interior Signage. Comply with requirements of the ADAAG and UFAS. Provide interior room identification signage for all rooms. Provide gloss or matte finish plaques with slots in base laminate for insertion of changeable message strips.

Toilet Accessories

Grab Bar. Grab bar shall be 18 gauge, 1.25" OD Type 304 stainless steel. Length and form shall comply with handicapped accessibility codes. Flange shall have mounting holes concealed. Grab bar shall have satin finish and peened non-slip surface. Installed bars on concealed blocking. They shall be capable of withstanding a 2.225 kN 500 lb vertical load without coming loose from the fastenings and without obvious permanent deformation. Space between wall and grab bar shall be 1.5".

Mirrors. Glass for mirrors shall be Type I, transparent flat type, Class 1-clear. Glazing quality q-1 ¼" thick conforming to ASTM C 1036. Glass shall be coated on one surface with silver coating, copper protective coating, and mirror backing paint. Silver coating shall be highly adhesive pure silver coating of a thickness, which shall provide reflectivity of 83 percent glass, and shall be free of pinholes or other defects. Mirror backing paint shall consist of two coats of special scratch and abrasion-resistant paint and shall be baked in uniform thickness to provide a protection for silver and copper coatings, which will permit normal cutting and edge fabrication.
Framed mirrors over lavatories shall be 24" wide x 36" high in a polished stainless steel frame mounted on the wall with concealed and tamper resistant fasteners.
Full-length mirrors shall be 24" wide x 72" high in a polished stainless steel frame mounted on the wall with concealed and tamper resistant fasteners.
Mirrors over counters shall be one piece 48" high and 2" less than the length of the countertop. Mount the mirror using a continuous stainless steel head and sill track.

Paper Towel Dispenser. Scott Towel Dispenser, roll towel type, type 304 stainless steel finish.

Sanitary Napkin Disposer. Constructed of type 304 stainless steel with removable leak-proof receptacle for disposable liners. Fifty disposable liners of the type standard

with the manufacturer shall be provided. Receptacle shall be retained in cabinet by tumbler lock. Disposer shall be provided with a door for inserting disposed napkins, and shall be partition or surface mounted.

Soap Dispenser. Soap Dispenser, 1000ml, twinpack sani-fresh, push soap release, Finish: type 304 Stainless Steel

Toilet Tissue Dispenser. Toilet Tissue Dispenser, Finish: type 304 Stainless Steel

Waste Receptacle. Surface mounted or floor receptacle. Reusable liner, of the type standard with the manufacturer shall be provided. Receptacles with push doors and door for access to the waste compartment shall have continuous hinges. Locking mechanism shall be tumbler key lock.

Shower Curtains and Rods . Rods shall be heavy-duty stainless steel pipe and brackets. Shower curtains shall be fabric supported by stainless steel hooks.

Shower Doors. Doors shall be heavy duty flush mounted Aluminum and glass doors. Glass to be ¼" tempered with vision obscuring pattern.

5-5.11 Not Used

5-5.12 Casework and Countertops

Casework. All work shall comply with the latest edition of the American Woodwork Institute (AWI) Quality Standards for custom casework.

Cabinets. Provide architectural cabinets complying with AWI Quality Standards, Section 400, Custom Grade cabinets. Cabinets with chrome plated handles, self-aligning friction hatches, and concealed hinges for 180 degree opening. Doors shall be flush overlay type. Provide wall bracket hangers for flush to wall mounting. Wall and base cabinets shall be same type of construction and appearance. Fabricate with frame construction throughout. Frames shall be solid hardwood not less than ¾" x 1 ½". Ends, bottoms, tops, and partitions shall be hardwood plywood not less than ½" thick. Cabinet backs and drawer bottoms shall be 3/16" hardwood plywood. Provide mortise and tendon, dowel joints and glue together to produce rigid unit. Finish all exposed edges of plywood with hardwood strips. Provide 3 ½" to 4" toe space with painted plywood or clear coated solid wood toe board. Provide one shelf per base cabinet and 2 adjustable shelves per wall cabinet. Shelves shall be ¾" hardwood plywood with edge bands and finished to match the cabinet. Cabinets shall not contain particle or fiberboard. Finish shall be oak hardwood with oak stain and clear matte urethane finish.

Countertops. Countertop and backsplash shall be constructed of ¾ inch plywood and shall be fully formed type with square edges using wood nose molding at counter edge and shall include an integral backsplash. Backsplash shall be not less than 3 ½ inches high. Edging and trim shall consist of plastic laminate cut and fitted to all exposed edges. End splashes of ¾ inch plywood shall be provided. Continuous sheets of longest length practicable shall be provided; straight counters shall be one piece. Joints, where required, in surface sheeting shall be tight and flush and held to a practicable minimum. GP50 plastic laminate shall be used. Plastic laminate shall conform to the requirements of NEMA LD 3 and plastic laminate adhesive shall be contact type applied to both surfaces. The post-forming plastic laminate shall not be bent to a radius smaller than the limit recommended by the plastic manufacturer.

Stainless Steel Countertops. Countertops, base storage cabinets, and backsplash shall be constructed of type 304 stainless steel. Where sink is

indicated, provide as one piece, seamless, steel sink and counter. Where indicated provide minimum, 20-gage stainless steel countertops & backsplashes, 16-gauge horizontal shelf surfaces, 18-gauge vertical body & cabinet, and 18-gauge liner parts & toe space. Side and Backsplashes shall be not less than 3 ½ inches high.

Kitchen Equipment.

Range/Oven. Restaurant Gas Range 36" wide, 6 burners and one 29" oven. 20,000 BTU's per open burner. 35,000 BTU oven. Stainless steel front, back riser, high shelf and 6" adjustable legs. Side finished in heat resistant paint. 3/4" rear gas connection and gas pressure regulator. Individual pilot for each burner. Full width pullout crumb tray under burners. Thermostat adjusts from 150° to 500°F. One year limited parts & labor warranty. AGA, NSF.

Refrigerator Freezer. Provide 48 C.F. of Refrigerator storage, and 20 C.F. of Freezer storage in dual temperature and side by side arrangement. Performance Rated Refrigeration System in Refrigerator and Freezer Compartments Utilizing Environmentally Safe Refrigerants. 3" Non-CFC Polyurethane Foam Insulation. Chrome Plated Flow Line Handles. Cam-Action Lift-Off Hinges. Self-Closing Doors. Cylinder Lock In Each Door. Automatic Electric Condensate Evaporator. Heavy-Duty, Epoxy-Coated Steel Shelves. External Dial Thermometer. Automatic Electric Defrost. Magnetic Snap-In Door Gasket. 1/3 HP Refrigerator unit, and 1/3 HP Freezer unit.

Ice Maker. Provide 20" wide, 36" high, and 22.5" deep stand-alone unit with icemaker and bin storage combined. Air Cooled machine shall produce 95 lbs of cubed ice daily and have storage capacity for 33lbs.

Dish Washer. Heavy Duty commercial grade under counter dishwasher. Chassis, wash tank and external housing constructed of 304 stainless steel. Low heat and noise emissions. Wash tank - 7.25 gallons. Automatic fill and water level regulation of tank.

Microwave. Wattage shall be 1200W. Stainless steel cabinet and interior. 20 memory items, with one touch access to 20 frequently used menu items. 11 power levels. Unit shall be on a shelf integrated in the wall cabinets.

Window Treatments

Mini-blinds. FS AA-V-00200, Type II, horizontal aluminum mini-blinds at all exterior windows, except windows and storefront in corridors and lobbies. Blinds shall have one-inch wide x .008-inch thick slats with anti-static, anti-microbial polyester baked enamel finish. Provide heavy duty 1" x 1-1/2" steel head rail, and tubular steel bottom rail finished to match slats. Ladders woven or braided and ladder cords shall be polyester, ends fused with plastic tassel. Locate tilting device on left side.

5-5.13

Security System

See SOW Chapter 9 Electrical for requirements.

Vestibule 121

Each pair of doors in vestibule 121 shall be operated remotely with its own set of controls from Receptionist Room 122.
Exterior Doors Operation: Digital Cypher lock locked at all times. May be unlocked by combination input from outside or by “Buzz-in” at controls located in Receptionist 122.
Interior Doors Operation: Digital Cypher lock locked at all times. May be unlocked by combination input inside the vestibule or by “Buzz-in” at controls located in Receptionist 122.

5-5.14

Lockers

Turnout Gear Storage. Open-air shelves and clothes hooks in 24” wide x 21” deep x 74” high units suitable for storage and drying of protective clothing. Protective clothing includes Jackets, pants, boots, hood, helmet, and SCBA. Each unit shall have full-length open-air dividers, a coat hanger, two utility hooks for bunker pants and one member name plate. Turnout gear storage units to be wall mounted with fasteners suitable to hold weight of protective clothing and full SCBA. Boots are to be stored on an open-air shelf and are not to rest on the floor.

Lockers. Strong 16 ga. steel vented lockers to permit free air circulation in a 24” wide x 24” deep x 78” high units with shelves and hooks suitable for storage and drying of protective clothing. Provide one single and two double hooks. Powder coated paint finish and closed base. Vented locker door and dividers. Recessed handles with padlock provision. Sloped top. Number plates.

5-5.15

Plumbing

Electric Water Cooler. Vandal-resistant, barrier-free, wall mounted, self-contained, 8 GPH, electric water cooler. Refrigeration system balanced to provide low energy usage and a longer life assured by utilizing a high displacement compressor, a counterflow cooling evaporator/chiller, efficient capillary sizing, a large capacity dryer-strainer, and a fan-cooled condenser with maximum heat exchange. A wire service cord and polarized plug to be furnished by the manufacturer; 115V, 60 Hz. Environmentally friendly, refrigerant controlled by calibrated capillary tube, 14 gauge satin finish stainless steel cabinets. The bubbler heads shall be locked by stainless steel pins in the base. The recessed activation buttons made of chrome-plated brass and are front adjustable. The access plate made of a one-piece, 14 gauge steel with finger safe ventilation louvers and hidden, and vandal-proof fasteners. Comply with the standards of the Safe Drinking Water Act and Lead Contamination Control Act. All components in the waterway shall contain less than 0.1% lead. See Haws Corporation, Model HWCA8.

Mop Sink. Stern Williams, Crescent Model CRS-2200 Radial designed corner model that occupies minimum floor space, 6” front drop with stainless steel cap, 28” x 28” x 12” or equal.

Sink. One-piece, seamless, minimum 0.9 mm thick 20-gage stainless steel sink in counter. Provide swing spout faucet with aerator, 3 ½” stainless steel drain basket.

Trench Drain. Apparatus room trench drains shall have a fine grate cover and be connected to an approved oil/water separator prior to interconnection to sanitary sewer.

Hose Bib. Interior water faucet, with quick coupler hose bibb connections, shall include wall mounted hose reel at 2’-0”clear above finished floor. Locate hose bibbs between bays along north and south exterior walls. Hose bibs and reel controls shall be safely accessible

when apparatus bay doors are in open or closed positions.

Laundry Equipment.
Washer shall be electric 120V, 27” with 3.34 C.F. capacity. Provide 5 temperature settings. Electronic controls and 1/2hp motor. Provide 14 cycles and options.
Dryer shall be electric 240V, 27” with 6 C.F. capacity. Front loading side swing door. Mechanical controls and 1/4hp motor. Provide 11 cycles and options.

Physical Therapy Equipment. Sports type, stainless steel, hydrotherapy whirlpool bath. Capacity of 110gal, stationary with legs, and 56" L x 24" W x 25" D. Provide optional combination table with seats of heavy duty construction for 24” wide units. Pro-Med model S-110-SL or equal.

5-6 Finish and Door Schedule

Rm #	Room Name	Floor	Base	Walls	Ceiling	Ceiling Ht.	Remarks	Doors/Hardware
100	Apparatus Bays	EPOXY	EPOXY	PT CMU	PT ES	NA	K/12(6), D/13,D/15,C/3(2),	
101	Medical Storage	EPOXY	EPOXY	PT GWB	ACT	9’-0”	7	F/4
102	Fire Exting. Maint.	EPOXY	EPOXY	PT GWB	ACT	9’-0”	7	F/5
103	SCBA Maintenance	EPOXY	EPOXY	PT GWB	ACT	9’-0”	7	F/5
104	Electrical Room	SC	VB	PT GWB	PT ES	NA	NA	F/4
105	F&E Services Storage	CC	VB	PT GWB	PT ES	NA	7	E/14, J/11
106	Mechanical Room	SC	VB	PT GWB	PT ES	NA	7	E/14
107	Corridor 1	PCT	PCT	PT GWB	ACT	9’-0”	5,7	B/2
108	Vestibule	EM/PCT	PCT	PT GWB	ACT	9’-0”	1, 3, 7	A/16,L/17
109	Corridor 4	PCT	PCT	PT GWB	ACT	9’-0”	5,7	NA
110	Laundry	PCT	PCT	PT GWB	ACT	9’-0”	5,7	I/8
111	Kitchen	PCT	PCT	PT GWB	ACT	9’-0”	NA	I/11(2),J/11(2)
112	Dining Room	CC	WD	PT GWB	ACT	9’-0”	5,7	I/8(2), B/2
113	Lounge	CPT	WD	PT GWB	ACT	9’-0”	5,7	I/8(2)
114	Storage	CPT	VB	PT GWB	ACT	9’-0”	NA	H/10(2),J/11
115	Janitor’s Closet	PCT	PCT	PT GWB	ACT	9’-0”	4.3	J/11
116	Training EMS	CPT	WD	PT GWB	ACT	9’-0”	5	I/8
117	Men’s Room	PCT	PCT	PT GWB	ACT	9’-0”	3	J/9
118	Women’s Room	PCT	PCT	PT GWB	ACT	9’-0”	3	J/9
119	Station Officer	CPT	WD	PT GWB	ACT	9’-0”	NA	I/8

120	Assistant Chief	CPT	WD	PT GWB	ACT	9’-0”	NA	I/8
120A	Assistant Chief Bunk	CPT	WD	PT GWB	ACT	9’-0”	NA	I/8
121	Vestibule	EM/PCT	PCT	PT GWB	ACT	9’-0”	1,3,7	A/1,L/6
122	Reception	CPT	WD	PT GWB	ACT	8’-0”	5,7	NA
123	Copy File Room	CPT	WD	PT GWB	ACT	9’-0”	5	I/8
124	Corridor 3	PCT	PCT	PT GWB	ACT	9’-0”	5,7	B/2
125	Chief Bunk	CPT	WD	PT GWB	ACT	9’-0”	NA	J/8
126	Fire Chief	CPT	WD	PT GWB	ACT	9’-0”	NA	I/8(2)
127	Bunk	CPT	WD	PT GWB	ACT	9’-0”	6	I/8
128	Bunk	CPT	WD	PT GWB	ACT	9’-0”	6	I/8
129	Bunk	CPT	WD	PT GWB	ACT	9’-0”	6	I/8
130	Men’s Showers	PCT	PCT	CT PT GWB		9’-0”	3,4	J/7(2)
131	Vestibule	PCT	PCT	CT PT GWB		9’-0”	NA	I/7, I/9
132	Women’s Shower	PCT	PCT	CT PT GWB		9’-0”	3,4	J/7
133	Physical Therapy	PCT	PCT	CT PT GWB		9’-0”	3,4	J/9(2)
134	Communications	CC	VB	PT GWB	PT ES	NA	NA	J/11
135	Bunk	CPT	WD	PT GWB	ACT	9’-0”	NA	I/8
136	Bunk	CPT	WD	PT GWB	ACT	9’-0”	NA	I/8
137	Corridor 2	PCT	PCT	PT GWB	ACT	9’-0”	5,7	NA
138	Outdoor Dining Area	CC/GR	Precast	Brick	Open	NA		

Remarks

1 Recessed floor entrance mat
2 Not Used
3 60” high ceramic tile wainscot
4 Water resistant gypsum board
5 34” high chair rail with painted wainscot
6 Partition between Bunk rooms shall be removable, leaving one large finished space in the future.
7 Impact resistant gypsum board walls

Abbreviations

ACT Suspended acoustic ceiling tile
CC Colored concrete
CPT Carpet
CT Ceramic tile
EM Recessed entrance mat
GR Grass
Ht Height
NA Not applicable

Paver	Precast concrete paver
PCT	Porcelain ceramic tile
PT CMU	Painted concrete masonry units
PT ES	Paint exposed structure (and all other unfinished items in room)
PT GWB	Painted gypsum board
Rm #	Room number
SC	Sealed concrete
VB	Vinyl Base
WD	Wood

Doors

Door type	Description
A	Exterior aluminum entrance, pair
B	Exterior aluminum entrance
C	Exterior hollow metal with vision panel
D	Exterior hollow metal with vision panel, pair
E	Exterior hollow metal, pair
F	Exterior hollow metal
G	Interior aluminum entrance, pair
H	Interior wood, pair
I	Interior wood with vision panel
J	Interior wood
K	Exterior apparatus bay vehicle doors
L	Interior wood, pair with vision panel

Door Hardware

HW number	Description	
1	Ext storefront pair-	pivots, digital cipher lock, ss push/pull rods, concealed flush bolts, conc. closers
2	Ext storefront-	pivots, cipher lock, ss push/pull, concealed closer
3	Ext HM exit-	passage lockset, flush panic bars, closer, kick plate
4	Ext HM exit-	lockset, concealed flush bolts, hold open, kick plate
5	Ext HM exit-	entrance lockset, hold open, kick plate
6	Interior storefront pair-	pivots, digital cipher lock, ss push/pull rods, concealed flush bolts, conc. closer
7	Interior –	ss push /pull bar, kick plates, closer,
8	Interior office –	classroom lockset
9	Interior-	privacy lockset
10	Interior-	storeroom lockset, concealed flush bolts, kick plate
11	Interior-	storeroom lockset, kick plates
12	Ext Apparatus bay door-	manufacturer's HW as required for automatic folding doors
13	Ext HM exit pair-	cipher lock, flush panic bars, concealed 3 point lock, closer, kick plate
14	Ext HM exit pair-	lockset, concealed flush bolts, hold open, kick plate
15	Ext HM exit pair-	passage lockset, flush panic bars, closer, kick plate
16	Ext storefront pair-	pivots, cipher lock, ss push/pull rods, concealed flush bolts, concealed closers
17	Interior storefront pair-	pivots, ss push/pull rods, concealed flush bolts, concealed closer

General Door notes

All doors with "Ext" in hardware description shall be weatherstripped.
All doors shall have anti-friction ball bearing hinges unless otherwise indicated.
All doors shall have wall or floor mounted stops as appropriate.
All doors and frames shall be fire rated and labeled and include appropriate accessible hardware as required by code.
Hardware finish shall be polished stainless steel or chrome plated brass/bronze.
Door closers, where required, shall be mounted on the private side of doors.
All locks to provide egress function (no one may be locked in) by turn of lever or push bar.

Rm #	Room Name	Floor	Base	Walls	Ceiling	Ceiling Ht.	Remarks Doors/Hardware
200	Apparatus Bays	EPOXY	EPOXY	PT CMU	PT ES	NA	K/12(10),C/3(2),D/13

201	Decontamination	EPOXY	EPOXY	PT GWB	PT ES	NA	3	F/11
202	Electrical	SC	VB	PT GWB	PT ES	NA	NA	F/4
203	Storage	CC	VB	PT GWB	PT ES	NA	7	J/11
204	Corridor 5	PCT	PCT	PT GWB	ACT	9'-0"	5,7	B/2
205	Bunk	CPT	WD	PT GWB	ACT	9'-0"	NA	J/9
206	Bunk	CPT	WD	PT GWB	ACT	9'-0"	NA	J/9
207	Bunk	CPT	WD	PT GWB	ACT	9'-0"	NA	J/9
208	Mechanical	SC	WD	PT GWB	PT ES	NA	7	E/14
209	Vestibule	EM	PCT	PT GWB	ACT	9'-0"	1,3,7	A/1,G/6
210	Corridor 8	PCT	PCT	PT GWB	ACT	9'-0"	5,7	NA
211	Bunk	CPT	WD	PT GWB	ACT	9'-0"	NA	J/9
212	Bunk	CPT	WD	PT GWB	ACT	9'-0"	NA	J/9
213	Bunk	CPT	WD	PT GWB	ACT	9'-0"	NA	J/9
214	Communications	CC	VB	PT GWB	PT ES	NA	NA	J/11
215	Janitors Closet	PCT	PCT	PT GWB	ACT	9'-0"	4.3	J/11
216	Men	PCT	PCT	PT GWB	ACT	9'-0"	3,4	J/7
217	Vestibule	EM	PCT	PT GWB	ACT	9'-0"	1,3,7	A/1,G/6
218	Corridor 7	PCT	PCT	PT GWB	ACT	9'-0"	5,7	B/2
219	Bunk	CPT	WD	PT GWB	ACT	9'-0"	NA	J/9
220	Bunk	CPT	WD	PT GWB	ACT	9'-0"	NA	J/9
221	Bunk	CPT	WD	PT GWB	ACT	9'-0"	NA	J/9
222	Bunk	CPT	WD	PT GWB	ACT	9'-0"	NA	J/9
223	Laundry	PCT	PCT	PT GWB	ACT	9'-0"	3,4	J/8
224	Women	PCT	PCT	PT GWB	ACT	9'-0"	3,4	J/7
225	Bunk	CPT	WD	PT GWB	ACT	9'-0"	NA	J/9
226	Bunk	CPT	WD	PT GWB	ACT	9'-0"	NA	J/9
227	Corridor 6	PCT	PCT	PT GWB	ACT	9'-0"	5,7	D/13
228	Bunk	CPT	WD	PT GWB	ACT	9'-0"	NA	J/9
229	Bunk	CPT	WD	PT GWB	ACT	9'-0"	NA	J/9

230	Court Yard	CC/GR	Precast Brick	Open	NA

CHAPTER 6
DESIGN - STRUCTURAL

6.1 . GENERAL DESIGN CRITERIA.

6.1.1. Proposals shall comply with International Conference of Building Officials (ICBO) International Building Code, latest edition unless otherwise noted.

6.1.2. Design shall meet the minimum load standards shown in Table 6.1 and the following paragraphs.

Table 6.1 Minimum Design Load Table

DEAD LOAD

Building material…….……..…Actual weight

LIVE LOAD

Roof……..……. 20 psf
Offices……..…… 50 psf
Classrooms……. 40 psf
Storage/maintenance……..…….. 150 psf
Kitchen……..…….. 150 psf
Lobby, vestibule, large waiting rooms……..……. 100 psf
Corridors……. 100 psf
Mechanical Rooms…….….. 150 psf
File room……..…….. 150 psf
Toilet room……..…….. 60 psf
Dining room……..…… 100 psf
Lounge…… 100 psf
Bunk…… 50 psf
Laboratory…….. 100 psf
Physical Fitness…… 100 psf
Library……. 150 psf
Apparatus Bays……. AASHTO HS-25 min
where loads are exceed by stated equpment (see section 2.2), the floor shall be designed to support the worst case equipment load

6.1.3. Wind Data: ASCE Mininum Design Loads for Buildings and Other Structures (ASCE 7- Latest Edition)

6.1.4 Seismic Data: NEHRP Recommended Provisions for Seismic Regulations for New Buildings and Other Structures (FEMA 302)

6.1.5 Lateral Resistance. Shear walls for lateral resistance to wind or earthquake, shall have full foundations.

6.1.6. Frost Penetration. Foundations and utilities shall be located a minimum of 18 inches

below grade.

6.1.7. The structure shall be treated as an essential facility.

6.2. MINIMUM MATERIAL STRENGTHS

Shall be as follows:
Concrete Compressive Strength at 28 days
= 4000 psi
Reinforcing Steel - Fy = 60,000 psi
Structural Steel - Fy = 36,000 psi
Concrete Masonry Units B f'm = 1,350 psi
Brick Masonry B f'm = 1,500 psi

6.3. ALLOWABLE FRAMING SYSTEMS

6.3.1. The structural system shall meet the requirements of the design criteria. Structural materials may include structural steel, steel joist, light gage steel, concrete, concrete masonry units and metal deck.

6.3.2 Masonry

6.3.2.1. Stacked bond masonry shall not be allowed except as noted.
6.3.2.2. Masonry units shall not be re-used.
6.3.2.3. Mortar or concrete shall not be used in lieu of grout.
6.3.2.4. Masonry units used shall be ASTM C 90, moisture controlled type I units. Type II units shall not be used.
6.3.2.5. Provisions of UBC Section 2109 shall not be used.
6.3.2.6. Joint reinforcement shall be cold drawn deformed wire with a minimum 9 gauge longitudinal wire size. Joint reinforcement shall be hot dipped galvanized.
6.3.2.7. Control joint spacing shall conform to the values shown in table 6.2

TABLE 6.2 - RECOMMENDED MASONRYCONTROL JOINT SPACING[a]

Vertical Spacing of Joint Reinforcement With 2-#9 Wires [b] (in)	Maximum Ratio of Panel Length to Wall Height (L/H) ©	Maximum Spacing of Control Joints [d] (ft)
None [e]	2	18
8	3	24
16	4	30

[a] The designer may adjust the control joint spacing for local conditions. The recommended spacing may be increased 6 feet in humid climates and decreased 6 feet in arid climates.
[b] Joint reinforcement shall be cold drawn deformed wire with a minimum 9 gauge longitudinal wire size.
© L is the horizontal distance between control joints. H is generally the vertical distance

between structural supports.
(d) The spacing will be reduced approximately 50% near masonry bonded corners or other similar conditions where one end of the masonry panel is restrained.
(e) Not recommended for walls exposed to view where control of cracking is important.

6.3.3. Recommended control joint locations are as follows:

6.3.3.1. At regular intervals as noted in table above.

6.3.3.2. At changes in wall height or thickness. (This does not include at pilasters)

6.3.3.3. Near wall intersections in L, T, and U shaped buildings at approximately 50% of the spacing required above.

6.3.3.4. At other points of stress concentration.

6.3.3.5. A key-way or interlock will be provided across control joints as a means of transferring lateral shear loads perpendicular to the plane of the wall.

6.3.3.6. Control joints in masonry unit walls will be continuous and vertical. Control joint details must provide an uninterrupted weak plane for the full height of the wall, including intermediate bond beams and masonry foundation walls. However, reinforcing steel in structural bond beams must be continuous through control joints. Control joints need not extend into reinforced concrete walls.

6.3.3.7. Adding, eliminating, or relocating control joints, where the lateral load resisting system is sensitive to control joint location, will not be permitted once the structural design is complete.

6.3.3.8. Shelf angles and lintels shall be secured against rotations and deflections over 1/16". A ½" space between the ends of shelf angles will be provided for thermal expansion. Shelf angles will be mitered and made continuous at the corners of the building. Shelf angles and lintels shall be hot dipped galvanized after fabrication.

6.3.4. Concrete Slabs on Grade

6.3.4.1. The following thicknesses for maximum uniform design live loads will be used provided the modulus of subgrade reaction (k) is as indicated in the geotechnical analysis. See Table 6.3.

6.3.4.2 All slabs will contain as a minimum the wire mesh reinforcement indicated. Glass fiber reinforced concrete may not be used in lieu of wire mesh reinforcement.

1-1 TABLE 6.3 - THICKNESS FOR MAXIMUM UNIFORM LOAD

Thickness of Slabs	Maximum Uniform Design Live Load	Wire Mesh Reinforcement/rebar
4 inches	150 PSF	6x6-W2.0xW2.0
8 inches	250 PSF	6x6-W2.9xW2.9
12 Inches	Per design	Per design

*With 4 inch thick slabs a maximum partition load of up to 400 per linear foot will be permitted. When partitions are located at the free edge of a 4 in. slab, however, a maximum partition load of 300 pounds per linear foot will be permitted provided the edges are thickened in accordance with TI 809-2. Slabs shall have a minimum concrete compressive strength of 3000 psi and a minimum thickness of 4 inches.

6.3.4.3 The area of sections bounded by crack control joints shall not exceed 625 square feet. The distance between crack control joints shall not exceed 25 feet.

6.3.4.4. The length to width ratio shall not exceed 1.5 and shall be as close to 1.0 as possible.

6.3.4.5 Crack control joints may be construction joints.

6.3.4.6 Where joints are not continuous through their perpendicular joints, they are considered to be discontinuous. At continuous joints, 4 bars 4 feet long will be placed parallel to the edge opposite the end of the perpendicular joint. Bars will be at mid-depth and 4 inches apart starting 2 inches from the edge of the slab.

6.3.4.7 Construction joints will be made from tie bars, dowels, or keys to provide shear transfer. Formed joints will only be used in slabs of 6 inches or more. Preformed keys left in place may be used for 4 inches or thicker slabs. The key will be centered on the depth of the slab.

6.3.4.8 Wire reinforcement will be continuous through slab construction joints and every other wire interrupted within 2 inches of each side of slab in control joints.

6.3.4.9 Control joints will be cut to a depth of one-fourth of the slab thickness and shall be cut as soon as possible, but in no case to exceed 12 hours after placement. Location and details of control joints will be shown on drawings.

6.3.4.10 Isolation joints shall be provided between the abutting faces of floor slab and fixed parts of the structure such as columns, walls, and machinery bases. At locations where slabs abut vertical surfaces, such as at interior and exterior foundation walls and column pedestals, isolation joints will ordinarily be a strip of 30-pound felt serving as a bond breaker. At exterior walls, perimeter insulation extended to the top of slab will serve the purpose. Location and details of isolation joints will be shown on drawings.

6.3.4.11 Embedment of Conduit and Pipes. Horizontal runs of conduit and pipes will not be embedded in slabs on grade unless additional transverse reinforcement, or reinforcement and thickening is provided over the pipe or conduit run. Embedded pipes

and conduits will not cross slab joints where detrimental movement is anticipated. Where embedment is permitted, specific requirements will be indicated on the drawings. Aluminum conduit and pipes will not be embedded in any concrete structure.

6.3.4.12 Expansion joints will be provided at the juncture of U, T, and L shaped buildings and when a change in the type of foundation construction creates the potential for differential settlement which could impact the building framing system.

A.1 References(Latest Edition)

AA, "Specifications for Aluminum Structures".

ACI-318, "Building Code Requirements for Reinforced Concrete".

ACI "Manual of Concrete Practice Vol 1-5 Latest Edition".

AISC, "Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings".

AISI, "Specifications of the Design of Cold-Formed Steel Structural Members".

ANSI, "American Standard Building Code Requirements for Reinforced Masonry".

ASCE 7, " Minimum Design Loads for Buildings and Other Structures".

AWS D1.1, "Structural Welding Code".
BIA, "Recommended Building Code Requirements for Engineered Brick Masonry".

FEMA 302, "NEHRP Recommended Provisions for Seismic Regulations for Buildings and Other Structures."

NCMA, "Specifications for the Design and Construction of Load Bearing Concrete Masonry".

NFPA, "National Design Specifications for Wood Construction (NDS)".

NFPA, "National Design Specifications for Stress Grade Lumber and Its Fastenings".

SDI, "Steel Diaphragm Manual".

SDI, "Publication No 29 Design Manual for Composite Decks, Form Decks, Roof Decks and Cellular Metal Floor Decks with Electrical Distribution".

SJI, "Standard Specifications and Load Tables, Olsen Web Steel Joists and Long-span. Steel Joists", and similar publications covering deep long-span steel joists.
Technical Instructions (TI) can be downloaded from: www.hnd.usace.army.mil/techinfo/ti.htm

CHAPTER 7

THERMAL PERFORMANCE

7-1 THERMAL CHARACTERISTICS. Building construction shall conform to the current version of ASHRAE 90.1. All buildings shall be classified as non-residential. R and U values shall be calculated in accordance with ASHRAE methods.

7-2 THERMAL INSULATION.

7-2.1 Characteristics. Thermal insulation shall have a flame-spread rating of 25 or less and a smoke-development rating of 50 or less, exclusive of the vapor barrier, when tested in accordance with ASTM E84. A vapor barrier shall be provided on the warm-in-winter side of exterior wall and ceiling insulation. Polyurethane is allowed as an insulation material for slabs and outside concrete or unit masonry walls. It is prohibited as an injected insulation material in walls or floor cavities or within the building envelope.

7-2.2 **R VALUE.** Provide the following minimum R-values unless otherwise indicated:

Exterior Walls	R19
Ceiling/Roof	R38
Slab on Grade	R5

7-3 INFILTRATION. To limit air infiltration, buildings will be sealed with an air infiltration barrier, installed in accordance with the manufacturer's recommendations. The building envelope shall be caulked, gasketed, weatherstripped or otherwise sealed: around window and door frames, between wall cavities and frames, between walls and ceiling and roof, between walls and floors, at access doors and panels, at utility penetrations through walls, floors, and roofs, and at any other exterior envelope joint which may be a source of air leakage. These steps shall constitute tight building construction.

CHAPTER 8

PLUMBING

8-1 **DESIGN STANDARDS AND CODES**. Plumbing system shall be designed and installed in accordance with the latest edition of the International Plumbing Code(IPC). Inspection and testing of the plumbing system shall be performed as prescribed in the International Plumbing Code. Specified materials and equipment shall be standard products of a manufacturer regularly engaged in the manufacturer of such products. Specified equipment shall essentially duplicate equipment that has performed satisfactorily at least two years prior to bid opening.

8-1.1 Additional consideration in the technical evaluation will be given to systems which incorporate measures beyond the requirements of this STATEMENT OF WORK which are designed to increase energy conservation, ease of maintenance, or occupant comfort (such as water filtration and purification), higher efficiency water heating systems, higher grade plumbing fixture materials, etc.

8-1.2 System design and installation must conform to the following mandatory energy and water conservation criteria: Title 10 CFR Part 434.

8-2 **DESIGN CALCULATIONS**.

8-2.1 Hot water heater calculations. Design shall be based on the methods described in the American Society of Plumbing Engineers (ASPE) Volume I, Fundamentals of Plumbing Design. Submit calculations for determining storage capacity and recovery rate. A separate hot water heater is planned for Phase 2, but gas piping shall be sized for Phase 1 and future Phase 2 requirements. Hot water storage tank temperature should be maintained at a minimum of 140 degrees F. Hot water delivered to plumbing fixtures shall not exceed 120 degrees F.

8-2.2 Water piping. Design shall be based on the International Plumbing Code for domestic water, sanitary waste and vent piping. All water piping shall be sized in accordance with methods outlined in the International Plumbing Code, to limit water velocity in the pipe to 8 ft/sec unless a lower velocity is recommended by the plumbing fixture manufacturer(s). Piping shall be sized to supply future Phase 2 requirements, such as the residential and heavy-duty commercial washers, hot water heater, and restrooms. Valved branch piping for future Phase 2 shall be provided. An isometric diagram of the water system shall be included in the design submittals. An isometric diagram of the sanitary sewer system, including appropriate venting, shall be included in the design submittals.

8-2.3 Natural Gas Piping. Gas piping and gas meter should be sized to accommodate Phase 1 equipment including emergency generator and future Phase 2 equipment, including infra-red heaters, gas-fired clothes dryers, and the H&V unit.

8-3 **EQUIPMENT**.

8-3.1 Water heaters shall have round, glass lined tanks, and shall be installed with an integral insulating wrap with a minimum R value of 5. Access shall be provided in the wrap for service and maintenance openings. Storage water heaters that are not equipped with integral heat traps and having vertical pipe risers shall be installed with heat traps directly on both the inlet and outlet. Circulating systems need not have heat traps installed. The water heater relief drain shall be manufacturer approved, and shall be indirectly connected to the building sanitary sewer system. Water heaters shall be sized in accordance with paragraph 8-2.1 for a 90 degrees F rise. Water heater energy factors shall meet or exceed the minimum requirements of 10 CFR Part 434 and shall be Energy Star labeled or have a minimum of 80% efficiency. Additional consideration in the technical evaluation will be given to designs which include water heaters which exceed the minimum energy

efficiency requirements and which utilize high efficiency, power vented, or sealed combustion water heaters.

8-3.2 Gas fired water heater. Gas fired water heaters for Phase 1 and Phase 2 domestic and laundry hot water heating shall be in accordance with ANSI Z21.10.1, Water Heaters, Gas, Volume I, Storage Type, 75,000 BTUH Input or less, and shall be high efficiency type. Water heaters shall be provided with power burner and shall be vented in accordance with manufacturer's instructions. Units shall be UL listed.

8-3.3 Pumps. Recirculating pump for domestic hot water shall be inline type and shall be provided whenever hot water piping extends further than 75 feet from the water heater tank. Expansion tank is required when using recirculating pump.

8-4 **FIXTURES**. The following fixtures will be acceptable for the facilities on this project except where noted otherwise for specific buildings. Provide handicap accessible type as required by Uniform Federal Accessibility Standards (UFAS). Fixtures shall be water conservation type, in accordance with the International Plumbing Code. Fixtures shall be provided complete with fittings, and chromium- or nickel-plated brass (polished bright or satin surface) trim. All fixtures, fittings, and trim in a project shall be from the same manufacturer and shall have the same finish.

8-4.1 Vitreous china plumbing fixtures shall conform to ANSI A112.19.2, Vitreous China Plumbing Fixtures. Stainless steel fixtures shall be in accordance with ANSI A112.19.3, Stainless Steel Plumbing Fixtures (residential design). Enameled cast iron plumbing fixtures shall comply with ANSI A112.19.1, and enameled steel fixtures shall comply with ANSI A112.19.4.

8-4.2 Exposed traps shall be chromium-plated, adjustable-bent tube, 20-gauge brass. Exposed traps for handicap lavatories shall be provided with PVC covers. Concealed traps may be PVC.

8-4.3 Water flow shall be no more than 2.5 gpm from any faucet. Lavatory faucets shall be the automatic sensor type, hard-wired. Gooseneck spout type shall be provided for handicap accessible fixtures.

8-4.4 Reduced pressure backflow preventer shall be provided in the building water supply main. A separate backflow preventer shall be provided for the sprinkler water supply main. Backflow preventers shall be provided for the makeup water supply for both the hot water heating system and the chilled water system.

8-4.5 Piping shall be run concealed to the greatest extent possible. Individual shutoff or stop valves shall be provided on water supply lines to all plumbing fixtures except showers. Isolation shutoff valves shall be provided for each bathroom group.

8-4.6 Water closets. Water closets shall have elongated bowl, close coupled siphon jet, wall-mounted or floor-mounted, open-front seat , and a flush valve. A wax gasket should be used for floor-mounted water closets, if a floor discharge is used. A neoprene gasket should be used for all rear discharge water closets. Flush valves shall be the automatic sensor type, hard-wired. Water consumption shall be no more than 1.6 gal per complete flushing cycle. Water closet trim shall conform to ANSI A112.19.5, Trim for Water-Closet Bowls, Tanks, and Urinals (Dimensional Standards). Floor or wall mounted water closets shall be water saver type and shall meet the requirements of the code. Water closets for handicapped usage shall meet UFAS requirements.

8-4.7 Urinals. Urinals shall be wall mounted and equipped with an automatic sensor type, hard-wired flush valve, and shall meet the requirements of the International Plumbing Code.

8-4.8 Lavatories. Lavatories shall be rectangular or oval, counter top type or wall-hung type, rectangular minimum 20 by 18 inches in size or oval minimum 19 by 16 inches in size. Lavatories shall be vitreous china except that counter top type may be enameled cast iron rimless type (without rings), or cross-link acrylic molded counter top with integral bowl. Lavatories shall have copper alloy or stainless steel strainer drains.

8-4.9 Showers. Showers shall be equipped with a combination valve and flow control device to limit the flow to 2.5 gpm at pressures between 20 and 60 psi. Shower faucets shall be provided with temperature sensing anti-scald devices.

8-4.10 Kitchen sinks. Kitchen sinks shall be Type 304 stainless steel, 20-gauge minimum, seamless drawn, and sound deadened. Sinks shall be triple bowl, self-mounting without mounting rings, complete with cup strainer and plug. Food waste disposer shall be included.

8-4.11 Service sinks. Shall be floor mounted, standard size and meet the requirements of the code and be provided with vacuum breakers on the water supplies. Provide service sink in apparatus bays area and in the Fire Extinguisher Maintenance Room with both hot and cold water.

8-4.12 Electric water coolers. Units shall be electric refrigerated type and shall conform to the requirements of UFAS, ARI 1010 and the Lead Contamination Control Act of 1988.

8-4.13 Clothes Washer. Provide washer connection box for laundry rooms. Heavy duty commercial type clothes washer suitable for washing/decontaminating firemen's uniforms is planned for Phase 2.

8-5 **PIPING SYSTEMS**. Piping shall be run concealed to the greatest extent possible. Individual shutoff or stop valves shall be provided on water supply lines to all plumbing fixtures except showers. Provide cathodic protection and pipe joint bonding systems as required.

Gas. The design and installation of natural gas distribution systems and equipment shall be in conformance with manufacturer's recommendations and applicable sections of ASME B31.8 and AGA-01. The installation of interior natural gas distribution systems shall be in conformance with the provisions of NFPA 54 and AGA-01 except that the use of plastic piping is prohibited. The use of semi-rigid tubing and flexible connectors for gas equipment and appliances is prohibited. Provide accessible gas shutoff valve and coupling for each gas equipment item. Comply with IBC or model code seismic requirements. Exposed horizontal piping shall not be installed farther than 6 inches from the nearest parallel wall in areas where clothes hanging could be attempted. One gas outlet shall be provided outside with associated valve and adapter for outdoor gas grill connection in vicinity of outdoor dining area. Gas piping shall be properly sized and terminated with isolation valve and cap for Phase 2 connection.

8-5.1 Domestic water piping. Piping and fittings shall be copper tubing. Isolation shutoff valves shall be provided at each fixture and piece of equipment, and at each toilet and kitchen. Under slab supply piping shall be limited to service entrance only.

8-5.2.1 Copper tubing. Water piping under concrete slabs shall be copper tubing, type K, annealed. Joints under the slabs are prohibited. If copper tubing is selected for interior water piping, it shall be type L hard-drawn copper. Fittings for soft copper tubing shall conform to ANSI B16.26, Cast Copper Alloy Fittings for Flared Copper Tubes, and for hard-drawn to ANSI B16.22, Wrought Copper and Copper alloy Solder Joint Pressure Fittings.

8-5.2.2 Soil, waste, vent, and drain. Soil, waste, and drain piping and fittings shall be cast iron. Cleanouts shall be provided as required by the International Plumbing Code. PVC is allowable for vent piping.

8-6 MISCELLANEOUS ITEMS.

8-6.1 Cleanouts. Cleanouts shall be provided at each change in direction of sanitary sewer lines, at the intervals specified in the International Plumbing Code, and at the building service entrance. All cleanouts shall be permanently accessible. Ground cleanouts shall be installed in a 12-inch by 12-inch concrete pad, flush with grade. Wall and floor types shall be provided as required by the code. Provide access panels or cover plates in exposed areas.

8-6.2 Wall hydrants. Wall hydrants shall be provided at locations such that all lawn areas, trees, and plants can be watered with a 100 foot hose without crossing main entrances. Wall hydrants shall be frostproof, and shall be supplied with an integral vacuum breaker. Also, provide hose bibbs on interior of vehicle bays at each wall area between doors to service all exterior and interior emergency vehicles. Provide as required by the code.

8-6.3 Trench Drains. Trench drains shall be provided to accommodate washing in the vehicle bays. All trench drains should pass through an oil/water separator before connecting to main sanitary line.

8-6.4 Floor Drains. All floor drains shall be trap primer type. Floor drains shall be provided in mechanical rooms, laundry rooms, kitchen, fire extinguisher maintenance room, SCBA maintenance room, and shower rooms. Floor drain shall be provided in Phase 2 Decon Room.

8-6.5 Air Compressor. Provide air compressor located in the Mechanical room with associated air piping, quick disconnects, and cutoff valves supplying air to the apparatus bays and Fire Extinguisher Maintenance Room. The air compressor and its piping system shall be sized to accommodate tire service in the apparatus bays of Phase 1 and Phase 2, and cleaning used fire extinguishers in the Fire Extinguisher Maintenance room. Provide one overhead compressed air outlet for each bay and at least one outlet in the Fire Extinguisher Maintenance room. The compressed air line shall be sized and extended and terminated by an isolation valve and cap for Phase 2 connection. Provide 1” copper outdoor air piping for self-contained breathing apparatus recharging equipment. Outdoor air intakes shall be a minimum of 10 feet aboveground and 30 feet from any exhaust.

8-6.6 Emergency Shower/Eye Wash. Emergency shower/eye wash stations shall be provided in the Fire Extinguisher Maintenance room and in the apparatus bays for both Phase 1 and Phase 2.

8-7.1 **PIPE INSULATION.** Insulation type shall be cellular glass(CG) – ASTM C 552 – Type II and Type III, polyisocyanurate(PC),- ASTM C 591 – Type I, or phenolic foam(PF) – ASTM C 1126 – Type III.

8-7.2 Domestic service hot water piping. Minimum pipe insulation thickness shall be 1-1/2” CG, 1” PC, or 1” PF.

8-7.3 Domestic service cold water piping, refrigerant suction lines, chilled water piping up to 2”, and roof drain piping shall be insulated with a minimum of 1-1/2” CG, 1” PC or 1-1/2” PF with vapor jacket. Chilled water piping over 2” shall be insulated with a minimum of 2” CG, 1” PC, or 1-1/2” PF.

8-7.4 Air conditioning condensate piping inside buildings shall be insulated with a minimum of 1” PC or 1” PF with vapor jacket.

8-7.5 Hot water heating piping shall be insulated with a minimum of 1-1/2” CG up to 1” pipe size, 2” CG up to 4” pipe size, or 1” PC or 1” PF for all pipe sizes.

8-7.6 Interior Roof drain piping (if used). Provide 1-inch thickness insulation on all interior horizontal piping.

CHAPTER 9

ELECTRICAL SYSTEMS

9-1 **DESIGN STANDARDS AND CODES**. Comply with laws, ordinances, rules and regulations of all local, state and federal authorities having jurisdiction and the rules and regulations of the National Board of Fire Underwriters, the National Electrical Code and local electrical company requirements. Prepare and construct the design under the supervision of a Registered Professional Electrical Engineer.

Electrical systems, including, but not limited to, interior power, exterior and interior lighting, communication systems, closed circuit TV, cable television (CATV), public address (PA) and cathodic protection shall be designed to comply with this section chapter and the documents listed below to the extent referenced in this section. The publications are referred to in the text by basic designation only.

Drawings, specifications, design analysis and calculations shall be provided as required elsewhere in this RFP for submittals for design proposals, and design after award.

Provide new electrical systems, complete and ready for operation. The design and installation of all electrical systems, including manufacturer's products, shall meet the instructions and requirements contained herein.

Electrical designs shall give maximum consideration to the comfort of the occupants. The design shall also be economical, maintainable, energy conservative and shall take into account the functional requirements and planned life of the facility. Electrical designs shall also consider life cycle operability, maintenance and repair of the facility and real property installed equipment components and systems. Ease of access to components and systems in accordance with industry standards and safe working practices is a design requirement. All like equipment and accessories at a facility shall be from a single manufacturer.

Provide branch circuits, disconnect switches, magnetic starters, and all other related electrical equipment and material for all architectural, mechanical equipment and environmental equipment to be installed in the project (includes the facility and site). This shall include all hand dryers, sensor operated plumbing fixtures, HVAC units, unit heaters, pumps, exhaust fans, and all other mechanical equipment in the facility. Contractor shall coordinate this electrical requirement with the architectural and mechanical requirements.

Electrical systems shall be installed to meet the appropriate seismic protection of the area, as required by UBC. Coordinate with structural designer.

The applicable recommendation standards, specifications, code and performances practices of the organization listed below shall govern all work and equipment.
NFPA - National Fire Protection Association
NEMA - National Electrical Manufacturers Association
IEEE - Institute of Electrical and Electronic Engineers
UL - Underwriter’s Laboratory
IPCEA - Insulated Power Cable Engineers Association
FM - Factory Mutual
OSHA - Occupational Safety and Health Administration
NEC – 2002 National Electric Code

9-2 **DESIGN CALCULATIONS**. Provide calculations for the following:

9-2.1 Interior lighting. Provide calculations for each room or area. Data should identify target and calculated illumination levels for all typical rooms. Calculations should be adjusted to compensate for special applications such as irregularly shaped rooms, open sides, ceiling obstructions (beams, ductwork), corridors, etc. If the lumen method is used for corridor calculations, the calculations should be performed using a module in which the length does not exceed 3 times the width (2:1 ratio preferred).

Computations shall be based on the simple lumen method using coefficients of utilization corresponding to 80 percent ceiling and 50 percent wall reflectance factors in office type applications (white suspended ceilings and light colored unobstructed walls). The floor coefficient of utilization factor shall be 20 percent for most areas with dark carpeting or tile. Lower levels shall be used such as 50 percent/30 percent factors for applications with CMU walls, dark colors, irregular surfaces and/or structural obstructions. A maintenance factor of 0.7 shall be used for the typical application (this value shall be adjusted for non-typical applications - 0.75 or 0.8 for a well maintained office or lab with a filtered air supply, 0.65 for a mechanical room with minimal maintenance).

9-2.2 Exterior lighting. Provide point-to-point calculations for all site lighting to include parking areas, walkways, and roadways.

9-2.3 Perform Load Analysis for building (including phase 1 and phase 2 areas) to include connected and estimated demand. Separate loads by categories such as lighting, receptacles, HVAC, special equipment, etc.

Electrical loads for power system component sizing shall be calculated in accordance with NEC Article 220 for demand factors, in accordance with the direction below and in accordance with the NEC for design factors. Design factors are factors in the code such as continuous loads use 1.25 times the load and largest motor is times 1.25. EMD equals connected load times demand factor times design factor.

a. Incandescent Light Fixtures. Connected load shall be the sum of the lamp wattages. Use a demand factor of 80% to 100%.
b. HID and Fluorescent Light Fixtures. Connected load shall be the sum of lamp wattages and the ballast loss factors. Use a demand factor of 80% to 100%.
c. General use receptacles. Connected load shall be 180 VA for each receptacle with a maximum of six receptacles. Use demand factors per NEC Table 220-13.
d. Dedicated or Special equipment receptacles. Connected load shall be the nameplate rating of the equipment or it shall be the receptacle rating. Demand factor shall be 75% to 100%.
e. Fixed equipment. Connected load shall be the nameplate rating. Demand factor shall be 75% to 100%.
f. Electric kitchen equipment. Connected load shall be the nameplate rating. Demand factors shall comply with NEC Article 220.
g. Motors. Connected load shall be the nameplate rating. Demand factor shall be 80% to 100% and shall comply with Article 220.
h. Spares. Equipment such as transformers, panelboards, switchgear, switchboards, and motor control centers shall have 25% spare capacity. (Usable circuit space and spare load capability.)

9-2.4 Fault – short circuit calculations for electrical system. Infinite bus shall be used for available utility short circuit current. Fault current analysis shall be performed from the nearest upstream device in the existing source system of the utility company and extend through the downstream devices at the load end.

Low Fault-Levels. If the fault level (at the service transformer secondary) is 14000 A.I.C. or less for 480 V systems and 10,000 A.I.C. or less for 208 V systems, no additional documentation is necessary (assuming appropriate follow through in selection of equipment S.C. ratings).

9-2.5 Voltage drop – Provide calculations to verify voltage drops. Do not exceed limits as given in the National Electric code (NEC).

9-2.6 Panelboard feeders shall be rated to ampacity of panelboard mains.

9-3 **MATERIALS AND EQUIPMENT**. All materials and equipment shall be the standard catalogued products of manufacturers regularly engaged in the production of such equipment and material, and shall be the manufacturer's latest design. All equipment and material shall be commercial specification grade and conform to the requirements of American National Standards Institute (ANSI), American Society of Testing and Materials (ASTM), National Electrical Manufacturer's Association (NEMA), National Fire Protection Association (NFPA) or other national trade association as applicable. Where standards exist, materials and equipment shall bear the label and be listed by Underwriters Laboratories, Inc. (UL) or other recognized testing organization.

9-3.1 Space requirements. Electrical rooms shall be provided for all electrical equipment. Space shall provide clearances and working areas as required by codes. Coordinate location to consider factors such as ease of maintenance, vicinity to loads being served and accessibility. Electrical, electronic and communication rooms and/or closets shall be separated from the mechanical rooms. Environmental control shall be provided in the communication room as needed to meet the equipment environmental requirements. All foreign piping and duct systems shall be prohibited from entering the electric, electronic and communication rooms.

9-3.2 Wiring. Shall be copper and shall be run in rigid steel, intermediate metal conduit or EMT except as otherwise required by the NEC. Minimum conduit size shall be ½". Do not use EMT underground or embedded in slab-on-grade. Rigid non-metallic conduit may be used in slab-on-grade and underground. Provide flexible conduit where required by NFPA 70. Minimum conduit size shall be ½". Use solid conductors for sizes No. 10 AWG and smaller, and stranded conductors for sizes No. 8 AWG and larger.

9-3.3 Motors. Motors shall be high-energy efficiency type. Motors larger than one-third horsepower shall be three phase. Motors one-third horsepower and smaller shall be single phase. Motor starters for mechanical and special equipment will be furnished as an integral part of the mechanical or special systems.

9-3.3.1 Motor Efficiencies. Minimum motor efficiencies shall be either Energy Star or in accordance with DOE Buying Energy Efficient Products Recommendations (refer to www.eren.doe.gov/femp/procurement for recommended efficiencies). Applications, which require definite purpose, special purpose, special frame, or special mounted polyphase induction motors, are excluded from these efficiency requirements. Motors provided as an integral part of motor driven equipment are excluded from this requirement if a minimum seasonal or overall efficiency requirement is indicated for that equipment by the provisions of another section.

9-3.4 Switchboard/panelboard. Dead-front construction, NEMA PB1 and UL 67. Circuit breakers shall be used in all switchboards and panelboards.

9-3.5 Exterior conduits for lighting and any other loads shall be heavy wall schedule 80 PVC type unless concrete encased conduits may be type EB.

9-4 GENERAL BUILDING ELECTRICAL DESIGN REQUIREMENTS

9-4.1 LIGHTING. Provide lighting that conforms to the requirements noted herein.

9-4.1.1 Interior. Lighting shall conform to levels noted in below table for space functions listed and in accordance with Illumination Engineering Society (IES) recommended levels for other areas not specified.

SPACE FUNCTION	DESIGN FC LEVEL
Office/Administrative Areas	50
Corridors/Hallways	20
Cleaning Closet	5
Kitchen	50
Lobbies	30
Mechanical/Electrical Rooms	15
Communication Rooms	50
Storage Rooms	10
Toilets	20
Equipment Rooms	20
Apparatus Bays	30

9-4.1.2 General Lighting Requirements: Fluorescent light fixtures with T8, 32 or 34 watt lamps shall be used in all areas of the building unless otherwise noted herein. Fluorescent lamps shall have a color temperature of 3000 degrees Kelvin, color rendering index of 85 or more and an initial lumen output of at least 2900. Fluorescent light fixtures in offices and related areas shall use 3 lamps and shall be deep cell parabolic fixtures. Offices and Briefing rooms shall be provided with multi-level switching (0%-33%-66%-100%). Fixtures in other areas such corridors, restrooms, lobby, storage, etc. shall be 2 or 3 lamp fluorescent type fixtures. Acrylic lenses on fluorescent fixtures may be used in restrooms, showers, etc., where fixtures are subject to damp atmospheres or where added protection for the lamps may be required. Fixtures in utility areas such mechanical rooms, electrical/communications room, storage rooms, and janitor's closet shall be industrial fluorescent type fixtures with open reflectors. Lamps in open industrial fixtures shall have protective tubes installed over the lamps. All ballasts shall be of the energy saving electronic type with power factor correction to exceed 90%. Low mercury "green type" fluorescent, compact-fluorescent, metal halide, and high pressure sodium lamps/bulbs shall be installed when available in the proper size and type for the application. Ballasts shall have a total harmonic distortion (THD) less than or equal to 10% and shall operate at a frequency range of 25k -33k Hz. Dimmable lighting can consist of dimmable compact fluorescent light fixtures instead of incandescent.

a. Provide emergency light fixtures and exit lights in accordance with NFPA requirements. Both shall have non-lead-acid type battery powered back-up, charge level meters and test buttons. Exit fixtures shall be of the LED type.

b. All light fixtures, exit signs, egress light fixtures, etc., shall be of the heavy commercial grade.

c. Provide exterior building luminaries (light fixtures) for general security by doors. Lamps shall be metal halide and sized to meet the lighting criteria and the most economical installation. Building entrances shall be lighted to 21 lux (2 foot-candles). Provide exterior illumination of the building perimeter out to a distance 20 feet beyond the building walls to a level of 10 lux (1 footcandle). Fixtures will be photoelectric controlled with Hand-Off-Automatic manual override switch located at main electrical equipment space.

d. Fluorescent fixtures used in Communication Room shall use ballasts that have appropriate filtering to reduce RFI and EMI emission so as not to interfere with electronic equipment.

e. Occupancy sensors shall be used for locations such as toilets, where use would be intermittent and where control would generally be accessible to several individuals or functions. Passive configurations such as infrared sensors are to be used, unless the application is better suited to ultrasonic or dual technology (provide toilets and showers with ultra-sonic or dual technology).

f. Location of light switches shall be coordinated with the floor plan and furniture layout to ensure that they are easily accessible and convenient. Location shall be coordinated with the User.

g. Under-cabinet countertop lighting shall be provided in the Kitchen Area.

h. Light switches shall be of the totally enclosed tumbler type and shall be ivory in color.

i. Provide lighting for maintenance purposes for all areas in which mechanical equipment is located including the outdoor mechanical equipment yard.

j. Fixture location shall be coordinated with the proposed furniture lay-out to minimize shadowing. Fixtures in administrative areas shall be specifically designed for use in areas with both conventional paper task and video display terminals.

k. Provide interconnection and control to automatically turn on all bunk area, corridor and apparatus bay lighting upon reception of alarm via radio or telephone system. Lights within bunk rooms shall ramp up from approximately 10% to full illumination level during a period adjustable from 10-60 seconds.

l. Each door in the apparatus bay, provide red/green signal lights to indicate corresponding closed/open status of door position. Signal lights shall indicate red for any position of the door that is not fully open and green for fully open doors. Signal lights shall be mounted in clear view of the vehicle cab.

9-4.2 POWER. Design and construct service transformer, normal and emergency service, service equipment and distribution panels to fully support both phase 1 and ultimate phase 2 construction. Provide raceway within the Phase 1 area to readily facilitate extension of power and lighting circuits into phase 2 area to serve projected requirements in that area. Provide underground generator feeder sized for the combined phase 1 and phase 2 building electrical load. Provide underground auxiliary power circuits for generator battery charger, crankcase heaters and empty conduit for remote generator monitoring panel located in corridor 124.

9-4.2.1 All circuits serving receptacle outlets shall be provided with a dedicated neutral conductor.

9-4.2.2 Lighting and receptacle outlets shall be on separate branch circuits.

9-4.2.3 A green equipment grounding conductor shall be provided, regardless of the type of conduit.

9-4.2.4 Transient Voltage Surge Suppressor (TVSS) shall be provided for protection of entire facility at main service equipment. Unit features and protection characteristics shall be equivalent to Square D's XT Series surge protective device. Unit shall be externally mounted next to the buildings main service equipment.

9-4.2.5 Device plates for outlet bodies and light switches shall be impact-resistant plastic, ivory in color.

9-4.2.6 Receptacles. Receptacles shall be ivory in color. Mounting heights are measured to center of device. Mount receptacles located within the Apparatus bay area at 24 inches above floor.

9-4.2.7 Duplex receptacles for general-purpose applications shall be 20 amp, 125 volt, 2-pole, 3-wire grounding type. A maximum of six duplex receptacles may be connected to a receptacle circuit. Receptacle circuits shall not supply lighting loads. General-purpose duplex receptacles shall be located in the facility as follows:

a. Provide general duplex receptacles every 10' along the walls in all areas of the building. For small rooms that do not have 10' walls, a minimum of one (1) outlet shall be installed on each wall. Receptacles shall be mounted 15" above finished floor (center of device), unless otherwise indicated or required. In addition, the location of the outlets shall be coordinated with the interior design package (furniture layout) to ensure proper placement. The contractor shall return to make final connections to any systems furniture furnished by the government; see the furniture plan included in the RFP.

b. Provide a general-purpose duplex receptacle adjacent to each mirror for each sink position located in the bathrooms. Receptacles shall have (GFI) ground fault interrupters. Mount receptacles 48" above finished floor.

c. Adjacent to all data/telephone jacks outlet locations, provide a general-purpose receptacle for electronic equipment.

d. Dedicated receptacles shall be provided for all known placement of electronic and other similar equipment as noted in Chapter 2, FUNCTIONAL AND AREA REQUIREMENTS, of this RFP.

9-4.2.8 Special Receptacles

a. Provide ground Fault Interrupter (GFI) receptacles in all rest rooms, sink countertops, janitor's closets, exterior of the facility, and other wet locations. Weatherproof receptacles for exterior use, shall be mounted in a box with a gasketed, weatherproof, cast-metal cover plate and gasketed cap over each receptacle opening with (GFI). The receptacle shall be rated for use with or without the plug attached. Exact location of the receptacles noted below shall be coordinated with the USER during the design of this project. Provide 20 amp,125 volt, 2-pole, 3-wire grounding type, duplex receptacles in the following locations:

b. Provide a duplex receptacle for each electric water cooler.

c. Provide dedicated duplex receptacles for the government furnished and government installed copier and fax machines.

d. Provide a duplex weatherproof receptacle with ground fault interrupter on the exterior of the building adjacent to each exit and apparatus bay door of the building. There shall be a least one receptacle per main exterior wall. Mount receptacles 24" above finished grade.

e. Provide two (2) duplex outlets every 72" along each wall in the Communications Room, but there shall be at least three duplex outlets along each wall. Outlets shall be 20A, 125 volt, duplex outlets with dedicated branch circuits. Three dedicated circuits shall be used in the Telephone Equipment Room. Receptacles shall be installed 15"above finished floor.

f. Computer outlets shall be duplex, 20 amp, 125 volt, 2-pole, 3-wire grounding type receptacles. A maximum of four duplex computer outlets shall be connected to a branch circuit. Circuits shall be sized using 480 volt-amps per computer. Neutral conductors shall be sized at 133% of the phase conductors. Computer outlets shall be labeled as "COMPUTER". Mount the outlets 15" above finished floor. Computer outlets shall be mounted near the Telephone/Data outlets, but maintain a separation of 6" from the Telephone/Data outlets. Exact location of all Computer Outlets shall be verified and coordinated with the USER during the design of the project. Location of outlets shall be coordinated with the interior design package to include the furniture layout.

g. For sizing the transformers, feeders and equipment, the designer shall assume each staff member will have a personal computer. The nonlinear to linear power ratio shall be computed, and the power distribution system shall be designed accordingly. Special power requirements shall be provided to serve minicomputers as recommended by the using agency and the computer manufacturer.

h. Three compartment floor outlets for power, telephone and data shall be provided in open office areas.

9-5 SPECIAL WIRING DESIGN REQUIREMENTS.

9-5.1 Electrical design of lighting, power, and communication systems shall provide for the functional features, equipment, and design requirements of the spaces described in Chapter 2, FUNCTIONAL AND AREA REQUIREMENTS, of this RFP. Provide empty raceways with pull string in Phase 1 area to readily facilitate installation of future power, communication and signal systems into Phase 2 areas not constructed under this contract. Raceway quantity, location and size shall be determined under this contract based upon information contained in this RFP.

9-5.2 Office Spaces. Private offices shall utilize walls for power and communication outlets to the maximum extent possible. 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 tele/power poles. Power, data and communication cabling shall be provided to all Government Furnished/Government Installed (GFGI) system furniture. This will require the Contractor to return to the building for final connections approximately 30 – 60 days following acceptance/substantial completion of the building by the Government.

9-5.3 General–purpose, 20 ampere wall-mounted duplex receptacles shall be provided throughout the facility (especially in corridors) for use by cleaning staff. Receptacles shall be located so that any point in all floor areas is within 20 feet of one of these receptacles. Also, provide exterior weather-proof GFCI 120V receptacles within 10 feet of all exterior doors and between each apparatus bay door on the exterior of the building.

9-5.4 Provide wiring for automated plumbing fixtures where required by architectural design.

9-5.5 Building electrical service shall be 3-phase, four wire, grounded.

9-5.6 A spare 4" conduit shall be provided from the phase 1 electrical room to a point 5' outside the building perimeter. Conduit shall be sealed and capped with pull wire.

9-5.7 Contractor shall ensure that NEC requirements for working clearances and routing of piping around electrical equipment installations are met.

9-5.8 Adequate power receptacles shall be provided for the audio/video equipment.

9-5.9 Configure power distribution and communication/signal systems such that they can be readily expanded during later phase 2 construction without demolition of walls and finishes. Provide empty raceway as required to facilitate future expansion. Install empty service entrance conduit for phase 2 power from the electrical room of phase one to the overhead of the apparatus bay with pull wire. Provide empty service entrance conduit from phase one communication room to the overhead of the apparatus bay with pull wire.

9-5.10 Provide two overhead electrical commercial/industrial 120V retractable power cord reels above each apparatus bay [i.e. all trucks to have a dedicated 120V-20A retractable power cord (six for phase one and ten for phase two)]. Cord shall be heavy duty 3#12 AWG, 45 feet in length and fitted with a single 20A receptacle. Each electrical access point will have a dedicated 20A circuit. This circuit is used for charging equipment on the trucks.

9-5.11 Provide a 240 volt, receptacle mounted 48" AFF on an outside wall for a GFGI Breathing Air Compressor (size receptacle for a 7.5 horsepower motor) in the Fire and EMS Storage room 105. Provide connection for apparatus bay air compressor.

9-5.12 Apparatus Bay Door Controls. Provide power connection for overhead doors. Automatic operating bay doors are to have master controls on each sidewall of the Apparatus Bay as well as an individual control at each door. In addition to hardwire controls, each door shall also be operable remotely from the cab of vehicle housed in respective bay.

9-6 TELECOMMUNICATIONS. Contractor shall coordinate all communications requirements with the User and the Fort Lee Directorate of Information Management (DOIM), (Mr. Jerome Boyd, Fort Lee, VA, 804-734-7500). Design shall conform to the requirements noted herein. The scope of work covered under this statement of work shall consist of the contractor furnishing all necessary engineering, labor, material, equipment, and testing to provide voice and data communication for support of information systems of the new Emergency Services Facility located on Adams Avenue. The contractor shall be responsible for installation of all cable, and connection hardware in accordance with all applicable ANSI/EIA/TIA standards. System shall be designed by a certified RCDD.

The government will perform:

1. Cross-connect of copper cables on termination facilities provided under this contract at the FESC and at Building 1109.
2. Provision of telephones sets and LAN equipment except as otherwise noted.

<u>General Contractor Requirements:</u>

a. Provide unshielded twisted-pair (UTP) cable in accordance with 568-A EIA/TIA standard. Cabling and terminations shall be CAT 6.
b. Provide communications room with continuous climate control to protect installed equipment.
c. Locate telecommunication room to ensure that the maximum cable distance to an outlet does not exceed 295 feet.
d. Provide horizontal building distribution cable in "home run" fashion from the communications (COMM) room to each work area (WA) outlet.

e. Where empty conduits are provided, provide with pull cord for future installation of cables.
f. Fiber Optic Connectors shall be “ST” type to maintain conformity to installation standard.
g. Provide Light Interface Units (LIU) for termination of all FOC strands at FESC and Building 1109.
h. Provide two telecommunication cabinets, 7’H, 19”W rack for TEL/LAN. Provide four 96 port RJ45 to 110 patch panels in each cabinet. Provide one 24 port single mode fiber optic patch panel for termination of outside plant fiber optic cable.
i. Provide dual outlets in the work areas for termination of horizontal cable. Outlet jacks shall be dual 8-pin modular, RJ45 for data and RJ11 for voice.
j. Provide a 4-pair 24 AWG unshielded twisted pair, Category 6 UTP cable to all WA outlet jacks. Terminate in accordance with ANSI/EIA/TIA 568-A standards. Provide test and test report for complete communication system per EIA/TIA standards.
k. Provide 2-4” empty conduits from the phase one communication room to the overhead in the apparatus bay for extension of communications system to phase 2 areas not constructed. Conduits are to be capped and have a pull wire.

9-6.1 Contractor shall install three plywood backboards 4’X 8’X ¾”, six 100-pair Building Protected Entrance Terminals with gas modules, and 50 ft stub tails. Install three 100 pair, 110-type with connect blocks in the Comm. Room for termination of inside plant copper cable. (Paint backboards with two coats of white fire-retardant paint.) A #6 AWG copper ground shall be provided at Communications backboards. Communication Room shall also have two 4” conduits installed through the floor slab and extending outside the building for five feet. Un-used conduit shall be capped at both ends for future use. Grounding system shall be in accordance with TIA/EIA –607.

9-6.2 Inside Plant

9-6.2.1 Horizontal Cable Distribution

9-6.2.1.1 Provide cable tray throughout the building for distribution of cable. NOTE: For cable tray, allow 1-in² per for cross section for each outlet served (i.e. 6” wide 4” can be used for 24 outlets). Cable runs should not exceed 295’ from Communications Room to work area outlet. These runs shall be “homerun” type with no splicing. Cable trays shall be routed to optimize cable installation and future access.

9-6.2.1.2 Provide 1” electrical metallic tubing from cable tray to each work area outlet.

9-6.2.1.3 Provide duplex administrative outlets in the work area (4-11/16” x 4-11/16”) with RJ-11 modular jack for voice (labeled and on top position) and RJ-45 module jack for data (labeled and on bottom position).

9-6.2.1.4 Provide 4-pair 24 AWG, 100 ohm Category 6 copper unshielded twisted pair (UTP) cables, in EMT conduit to each outlet and terminate in accordance with EIA/TIA 568-A standard.

9-6.3 Provide communications channel ladder in Communications Room to provide means to route cabling to racks and wall mounted termination facilities. Provide cable tray system looped from communication room around the building above corridor accessible ceiling to serve all outlet locations. Provide 1” electrical metallic tubing (EMT) to each outlet for installation of house cable.

a. Telecommunication outlet locations. System outlets shall be located as shown on the drawings or indicated in Functional and Area Requirements of this SOW. All administrative areas shall be provided with a minimum of one outlet at each

workstation. Two pay telephone outlets will be located as directed by the Contracting Officer. Coordinate outlet locations with actual furniture arrangement to be provided. A flush-mounted 4" double-gang box shall be installed at each outlet location. A one-inch EMT conduit with pull cord shall be run from each outlet box concealed in wall up above ceiling and over to above ceiling cable tray system run above corridor.

b. Make final connections to systems furniture furnished by the government.

9-7 SPECIAL SYSTEMS.

9-7.1.1 PUBLIC ADDRESS SYSTEM (PA).

The Public Address Systems provided by the contractor shall satisfy Force Protection Mass Notification requirements and will consist of two zones. Both PA zones shall be configured to provide building wide coverage of announcements with a minimum of one ceiling speaker outlet box in each room (excluding mechanical, electrical rooms). Each zone shall contain speakers with on/off/volume control for that zone. The on/off/volume control for each zone shall be located in one location to be chosen by User. Speakers with individual on/off/volume control shall be provided in private offices. PA system No.1 will be accessed by the building telephone system while PA system No. 2 shall be tied to the radio system to broadcast incoming radio traffic. System No. 2 shall include exterior speakers covering the entire perimeter of the building. These speakers shall be switch defeatable for night time operation. Radio console will be located in the electrical equipment room.

9-7.2 CABLE TELEVISION (CATV) SYSTEM. Provide for a 4" PVC conduit for CATV cable to run from the phase one communication room to a pedestal located adjacent to electrical manhole located along Adams Ave. Cable company will provide and install service cable at their cost. Design shall conform to the requirements noted herein and requirements of the cable television vendor. The Cable TV system is owned by Telemedia Cable. System outlets shall be located as indicated on the drawings or Functional and Area Requirements of this SOW. Provide one RG6 in ¾" conduit from Comm. Room to each outlet.

9-7.3 CLOSED CIRCUIT TELEVISION (CCTV) SYSTEM. Provide a complete color CCTV surveillance system to include cameras, monitors, recording, and multiplexing equipment. Camera and monitor locations shall be as indicated on the drawings. Outdoor cameras shall be housed in weatherproof enclosures, Monitors shall be wall or ceiling mounted types. Time lapse recorder shall be capable of operating in the real time mode and time lapse mode with up to 960 hours of recording time. Video duplexer shall be 16 channel, duplex with PIP and capable of displaying various multi-screen displays up to 16 windows.

9-7.4 RADIO RELOCATION. Remove existing radio from building 9513 and install in phase one electrical room 104. During phase two, remove existing radio from building 3620 and install in phase one electrical room 104. Radio is to be tied into PA system for broadcast of radio communications. Upon the reception of an alarm, the radio will turn on indicated lights within the facility.

9-7.5 RADIO TOWER. Provide two empty conduits (1-1" and 1-2") with pull wire and capped from the radio equipment in the phase one electrical room to the area where a GFGI, 20-25', Aluminum antenna is to be installed.

9-7.6 OVERHEAD PROJECTOR SYSTEM. Provide an overhead projector and projection screen with power and wall mounted control in the Lounge area for training and multi-media presentations.

9-7.7 DOOR CONTROL. Provide a digital keypad at each pair of doors at vestibule 121 for access control. Additionally, provide push button controls in room 122 for remote release of each vestibule door. Provide audible device in room 122 to alert receptionist to personnel requesting entry. Provide keypads, CPU and all necessary wiring and programming. System shall be equivalent to Securitron Model DK-26SS.

CHAPTER 10

UNIT DESIGN - HEATING, VENTILATING, AND AIR CONDITIONING

10-1 **DESIGN STANDARDS AND CODES**. The HVAC design shall be in accordance with 10 CFR Part 434 and the current versions of the Army Design Guides and Technical Instructions.

10-2 **DESIGN CALCULATIONS**.

10-2.1 Heat loss and heat gain calculations. Heating and cooling loads shall be in accordance with the current edition of the ASHRAE Handbook of Fundamentals. Computer-generated load calculations shall be provided, and shall include complete input and output summaries. Equipment shall be sized to meet the total load determined by computer calculation. Equipment may be oversized to no more than 115 percent of the computer generated load. Design shall be based on weather data from the Air Force Combat Climatology Center, http//www.afccc.af.mil; from ASHRAE Handbook of Fundamentals; or from other recognized and authoritative sources of weather data. Room air flow requirements shall be computed based on the individual room load. Values for internal cooling loads shall be included in the computerized load calculations in accordance with ASHRAE recommendations. Minimum space heating and ventilation shall be provided in spaces normally unoccupied, such as storage rooms and mechanical and electrical equipment rooms. Full cooling and heating shall be provided for the Phase 1 (medical vehicle) bays. An exhaust system meeting NFPA 88A shall be provided for the Phase 1 (medical vehicle) bays. In Phase 2, radiant gas-fired heaters, H&V unit and exhaust meeting NFPA 88A shall be provided in the apparatus (Fire Department vehicles) Bays. The communication rooms shall be provided with building air conditioning plus a separate thermostat controlled exhaust fan suitable for exhausting 10 air changes.

TABLE 10-1 – DESIGN CONDITIONS

Type of Design /Design Information	
Heating	
Indoor Design Temperature – All occupied spaces including Phase 1 Apparatus Bays	68 °F
Unoccupied Space Design Temperature	55 °F
Outdoor Design Temperature	17 °F
Annual Heating Degree Days	3939
Phase 2 Apparatus (Fire Department) Bays	55 °F
Cooling	
Indoor Design Temperature – All occupied spaces including Phase 1 Apparatus Bays	77 °F
Outdoor Design Dry Bulb Temperature	92 °F
Outdoor Design Wet Bulb Temperature	76°F

10-2.1.1 Load design criteria. The internal loads shown in Table 10-2 shall be included for each space listed. The degree of activity for all people shall be seated office work. Lights shall be included for the actual quantity provided. All scheduled equipment furnished under this contract shall also be included in the appropriate space. Where provisions are made for the installation of additional equipment to be furnished by others, the additional equipment shall also be included in the appropriate space.

TABLE 10-2 – INTERNAL LOADS

Space	People	Equipment
General Offices	1	1 PC/ person
Dining Room	3	1 PC 1 TV
Bunk Room	1	1 PC 1 TV
Training Room	5	1 PC
Kitchen	1	2 Commercial Cooking Gas Range/Ovens, Commercial Dishwasher, Microwave, 2 Refrigerators 1 Commercial Freezer 1 Icemaker
Rest Rooms, Janitor Closet	0	None
Staff Lounge	5	2 TV's, Refrigerator, Microwave
Corridors	1/300 SF	-
Future Physical Fitness	3	Fitness Equipment
Laundry Rooms: Phase 1 residential Phase 2 residential	1	Washer, Dryer
Storage	0	-
SCBA Maintenance	0	Tank Fill Equipment
Decontamination Room (Phase 2)	0	Commercial Washer Commercial Dryer
Medical Vehicle Bays	0	Bay Equipment

10-2.2 Ventilation air. Outside air requirements for the facility shall be based on the latest edition of ASHRAE Standard 62 Ventilation for Acceptable Indoor Air Quality. Restrooms, locker rooms, janitor closets, and showers shall be exhausted at two cubic feet per minute per square foot of floor space or 75 CFM per plumbing fixture, whichever is greater. Calculations determining minimum outside ventilation air and exhaust shall be provided for each building space. Outside air quantities will be sufficient to meet ventilation requirements and maintain a positive pressure relative to the outdoors in occupied areas. Outside air intakes shall be at least 10 feet above grade.

10-2.3 Piping calculations. Calculations shall be provided for pressure drop calculations for all piping systems, including head loss calculations for all pumps.

10-2.4 Duct calculations. Calculations shall be provided for sizing all duct systems, including static pressure drop calculations for all fans. Ductwork layout drawings shall also be provided to indicate all fittings and devices to substantiate calculations.

10-3 **MECHANICAL SYSTEMS**. Heating, air-conditioning, and ventilation shall be provided to the building spaces/rooms/Apparatus (medical vehicle) bays in phase 1 by a Variable Air Volume (VAV) air handling unit supplying conditioned air to strategically placed VAV Terminal Boxes. Building shall be provided with zoned heating and air conditioning systems. In phase 2, heating and ventilation shall be provided to the Apparatus (Fire Truck) Bays by a H&V unit. Systems shall be designed, installed, balanced, and adjusted to distribute heating and cooling to all habitable rooms, as well as heating to all equipment rooms, vestibules, rest rooms and shower rooms, in proportion to the calculated load requirements of these spaces. Additional consideration in the technical evaluation will be given to systems utilizing energy efficient equipment, additional space in the mechanical room, and other features, which contribute to ease of system operation and maintenance. The following zoning shall be considered a minimum:

Zone 1 – Fire Chief Office/Chief Bunk/Receptionist
Zone 2 – Asst. Chief/Stat. Office
Zone 3 – Kitchen/Dining Rm/Lounge
Zone 4 – Medical Storage/Rm 101/Rm 102
Zone 5 – Rm 133/Rm 134/Corridor
Zone 6 – Training EMS/Corridor
Zone 7 – Rm 126, Rm 127, Rm 128/Corridor
Zone 8 – Medical Vehicle Bays
Zone 9 – SCBA Maintenance
Zone 10 – Fire & EMS Storage
Zones for Phase 2 shall at a minimum be separate for North, West, South, and East bunks, and Decontamination Room.

The air-handling units will be located in Mechanical Equipment Rooms located in the ground level of the facility. The air-handling units will each contain cooling and preheat coils, return-air and outside-air control dampers, filters, and a variable frequency drive fan controlled by supply-air duct static air pressure. Air shall be returned to the air handling unit using a variable frequency drive return fan controlled to maintain the required amount of outdoor ventilation air and return air.

For each of the air handling systems, the Terminal Boxes will be located above the suspended ceiling near the room/space that it serves. Grouping of rooms to be served by a single terminal box will based on room function and air-conditioning loads. Each terminal box shall contain a primary air valve, to control the volume of conditioned air to be delivered to a room/space, and a heating coil. The terminal boxes shall be of the pressure independent type and parallel type fan. The outlets of the Terminal Box will be connected to ceiling diffusers in each room. Each terminal box will be controlled

by a room/space thermostat.

In Phase 2, the Heating and Ventilating (H&V) unit for the Apparatus (Fire Truck) Bays will be either located in the Mechanical Equipment Room or located in a mezzanine area in the Apparatus Bays, with a ladder and mezzanine space provided around the unit for access. The H&V unit will contain supply air and outside air control dampers, filters, supply fan, and a modulating gas-fired furnace. A separate VAV air handling unit for the bunk areas is planned for Phase 2 to serve the bunk area. Properly sized, chilled water and heating hot water supply and return lines with isolation valves and caps for Phase 2 shall be provided as a requirement of Phase 1.

The primary heating and cooling sources shall be a gas-fired hot water boiler, and air-cooled chiller operating with 30% Ethylene Glycol. Hot water boiler, air-cooled chiller, associated pumps, and piping shall be sized with enough capacity to handle the cooling/heating loads of future expansion in Phase 2.

10-3.1 Heating only systems. For spaces where heating only is required, provide unit heaters, fin tube radiation, cabinet heaters or convectors. Units shall be hydronic type.

10-3.2 Exhaust systems. Provide individual ceiling mounted fans or central exhaust fans with ductwork for janitor closet, storage, and toilet exhausts, and shower. Individual fans shall be controlled by light switch. Central fans shall be controlled by the DDC system. Provide individual thermostatically controlled exhaust fans for mechanical/electrical rooms and other spaces where ventilation only is required.

10-3.3 Unit heaters. Units shall be horizontal or vertical air discharge types complete with fans, hydronic coils, housing and discharge vanes or diffuser and wall mounted thermostats.

10-3.4 Fin tube radiation. Units shall be complete with hydronic coils and enclosures and wall mounted thermostats. Enclosures shall be constructed of sheet steel not less than 20 gauge.

10-3.5 Cabinet heater. Units shall be complete with fans, hydronic coils and enclosing cabinets and wall mounted thermostats. Cabinets shall be constructed of sheet steel not less than 20 gauge.

10-3.6 Convectors. Units shall be complete with hydronic coils and enclosing cabinets having bottom recirculating opening, manual control damper and top supply grille and wall mounted thermostats. Cabinets shall be constructed of black sheet steel not less than 20 gauge.

10-3.7 Exhaust fans. Fans shall be centrifugal type, in-line type or roof or wall mounted, direct driven with backward inclined, non-overloading wheel. Large fans may be belt-drive type. Motor compartment housing shall be hinged or removable and weatherproof, constructed of heavy gauge aluminum. Fans shall be provided with bird screen, disconnect switch, gravity or motorized dampers. Roof mounted units shall be provided with roof curb. Lubricated bearings shall be provided. Fans shall be tested and rated according to AMCA 210. Exhaust fan for Kitchen range hood shall be upblast power roof type meeting requirements of NFPA 96.

10-3.8 In-line fans. Fans shall have centrifugal, backward inclined blades, stationary discharge conversion vanes, internal and external belt guards, and adjustable motor mounts. Fans shall be mounted in a welded tubular or square casing. Air shall enter and leave the fan axially. Inlets shall be streamlined with conversion vanes to eliminate turbulence and provide smooth discharge air flow. Fan bearings and drive shafts shall be enclosed and isolated from the air stream. Fan bearings shall be

sealed against dust and dirt and shall be permanently lubricated, and shall be precision self-aligning ball or roller type. Fans shall be tested and rated according to AMCA 210.

10-3.9 Ceiling exhaust fans. Suspended cabinet-type ceiling exhaust fans shall be centrifugal type, direct-driven. Fans shall have acoustically insulated housing. Integral back draft damper shall be chatter-proof. The integral face grille shall be of egg-crate design or louver design. Fan motors shall be mounted on vibration isolators. Unit shall be provided with mounting flange for hanging unit from above. Fans shall be U.L. listed.

10-3.10 Range hoods. Range hoods shall be commercial type and shall not be short-circuit design type. Range hoods shall be equipped with lights. A fire damper shall also be included. Range hoods shall comply with NFPA 96 and shall be Type I, canopy style with grease extractors that can be cleaned in a dishwasher. Make-up air shall be provided by air distribution system, except supply/exhaust type hood may be provided if supply air making up some of the exhaust can be directed into room away from the hood. Fire suppression system shall be provided under range hood.

10-3.11 Vehicle Exhaust Systems. Vehicle exhaust venting systems shall be provided in all vehicle bays for all emergency vehicles. Systems shall be provided to accommodate 2 vehicles parked in tandem in each bay, except the ladder truck bay where only one vehicle will be parked in the bay. The vehicles are currently using a Nederman Magnatrack system. All vehicles shall be provided with an ignition-type transmitter. The system shall be designed to remove 100% toxic emissions from the Emergency Vehicles. A separate system will be provided for Phase 2. The nozzles, which shall be able to accommodate any vehicle type, shall be held on by magnets and shall be automatically disconnected when the vehicles exit the bays. The ventilation fan shall start automatically whenever the vehicle engine starts/runs. These systems shall operate on an overhead rail or track.

10-3.12 Fire Extinguisher Maintenance Exhaust System: A HEPA filtered tabletop exhaust hood with built in fan similar to LM Air Technology, Model FEH-4 shall be provided to prevent powder from escaping into room when extinguishers are filled inside the hood area. In addition, the fire extinguisher dry chemical filling system shall be placed on or near floor level, so that the top of the dry chemical bin is slightly above the work table and inside the hood.

10-4 **AIR DISTRIBUTION/CENTRAL EQUIPMENT.** Minimum equipment efficiencies shall be in accordance with DOE Buying Energy Efficient Products Recommendations (refer to www.eren.doe.gov/femp/procurement for recommended efficiencies) or Energy Star.

10-4.1 Air Handling Units. Units shall be indoor type. Units shall include fans, coils airtight insulated casing, adjustable V-belt drives, belt guards for externally mounted motors, access sections for maintenance, combination sectional filter-mixing box, vibration isolators, and appurtenances required for required operation. Air handling unit shall have published rating based on tests performed according to ARI 430. All sections shall be constructed of a minimum 18 gauge galvanized steel, or 18 gauge steel outer casing protected with a corrosion resistant paint finish. Casing may be of insulated double wall sealed panel construction capable of withstanding 8-inch w.g. negative or positive pressures. Casings shall be provided with inspection doors, access sections, and access doors. Inspection and access doors shall be insulated, fully gasket, double-wall type, of a minimum 18 gauge outer and 20 gauge inner panels. Drain pans shall be constructed water tight, treated to prevent corrosion, and designed for positive condensate drainage. Coils shall be fin-and-tube type constructed of seamless copper tubes and aluminum or copper fins mechanically bonded or soldered to the tubes. Coils shall be rated and certified according to ARI 410. Filters shall be listed according to requirements of UL 900. Filters shall be 2 inch depth, sectional, disposable type of the size

indicated and shall have an average efficiency of 25 to 30 percent when tested according to ASHRAE 52.1. Filters shall be rated UL Class 2. Fans shall be double-inlet, centrifugal type with each fan in a separate scroll. Fan bearings shall be sealed against dust and dirt and shall be precision self-aligning ball or roller type. Bearing life shall be L50 rated at not less than 200,000 hours as defined by AFBMA STD 9 and AFBMA STD 11. Bearings shall be permanently lubricated or lubricated type with lubrication fittings readily accessible at the drive side of the unit.

10-4.2 Heating and Ventilating Unit. H&V unit shall be indoor, gas-fired make up air unit. This unit shall include fan, gas-fired furnace, airtight insulated casing, adjustable V-belt drives, belt guards for externally mounted motors, access sections for maintenance, combination sectional filter-mixing box, vibration isolators, and appurtenances required for required operation. Air handling unit shall have published rating based on tests performed according to ARI 430. All sections shall be constructed of a minimum 18 gauge galvanized steel, or 18 gauge steel outer casing protected with a corrosion resistant paint finish. Casing shall be designed and constructed with an integral structural steel frame such that exterior panels are non-load bearing. Casings shall be provided with inspection doors, access sections, and access doors. Inspection and access doors shall be insulated, fully gasket, double-wall type, of a minimum 18 gauge outer and 20 gauge inner panels. Drain pans shall be constructed water tight, treated to prevent corrosion, and designed for positive condensate drainage. Filters shall be listed according to requirements of UL 900. Filters shall be 2 inch depth, sectional, disposable type of the size indicated and shall have an average efficiency of 25 to 30 percent when tested according to ASHRAE 52.1. Filters shall be rated UL Class 2. Fans shall be double-inlet, centrifugal type with each fan in a separate scroll. Fan bearings shall be sealed against dust and dirt and shall be precision self-aligning ball or roller type. Bearing life shall be L50 rated at not less than 200,000 hours as defined by AFBMA STD 9 and AFBMA STD 11. Bearings shall be permanently lubricated or lubricated type with lubrication fittings readily accessible at the drive side of the unit.

10-4.2.1 Gas-fired furnace. Large commercial models shall be high efficiency, indirect fired type in accordance with ANSI Z83.9. Furnaces shall have a minimum certified efficiency of not less than 80 percent at maximum capacity. Where all NFPA, other codes, and standards are met, a direct-fired model in accordance with ANSI Z83.4 may be used. Furnace design shall be certified by the AMERICAN GAS ASSOCIATION LABORATORIES (AGA). Gas-burning equipment shall include the gas burners, ignition equipment, gas-control valve, gas piping, gas-pressure regulating valve, when applicable, and accessories necessary for a fully automatic system that is listed in IAS Directory. Gas-fired units equipped with programming controls shall be furnished both with high and with low gas supply pressure switches in the fuel supply piping. Ignition systems shall be of the direct spark, hot surface, or interrupted intermittent type with automatic electric ignition. The pilots shall be of the electrically-ignited proven type. Continuous pilots will not be permitted. Burner shall be constructed of stainless steel, modulating type, and shall be designed in accordance with NFPA 54 and located so that parts are protected against overheating. Heat exchanger shall be of stainless steel construction.

10-4.3 Rooftop air handling units and H&V units shall not be used.

10-4.4 Variable Volume, Parallel Fan-Powered Terminal Unit. Variable volume, fan-powered terminal units shall be provided with a calibrated air volume sensing device, air valve or damper, actuator, fan and motor, and accessory relays. Units shall control primary air volume to within plus or minus 5 percent of each air set point as determined by the thermostat. Unit fan shall be centrifugal, direct-driven, double-inlet type with forward curved blades. Fan motor shall be either single speed with speed controller or three-speed, permanently lubricated, permanent split-capacitor type. Fan/motor assembly shall be isolated from the casing to minimize vibration transmission. Fan control shall be factory furnished and wired into the unit control system. Hot-water coils shall be fin-and-tube type constructed of seamless copper tubes and aluminum fins mechanically bonded or soldered to the tubes. Casing and tube support sheets shall be galvanized steel. Coils shall conform to the provisions of ARI 410. Unit enclosures shall be constructed of galvanized steel. Units with flow limiters are not acceptable. Unit air volume shall be factory preset and readily field adjustable without

special tools. Acoustical lining shall be according to NFPA 90A.

10-5 **COOLING EQUIPMENT.** Minimum efficiencies shall be in accordance with Energy Star or in accordance with the following minimum efficiencies:

Minimum Efficiency for Air-Cooled Chiller Unit

	Full Load EER	IPLV KW/TON
Air-Cooled		
150 tons or less	9.5	1.12

10-6 **AIR DISTRIBUTION SYSTEMS**. Provide duct systems conforming to the recommendations of the SMACNA Duct Construction Standards including seal class requirements. Fire dampers shall be provided where required by code. Balancing dampers shall be provided at all branch takeoffs and for all supply outlets. Permanent access to dampers shall be provided.

10-6.1 Ductwork. All ductwork including fittings and components shall be sheet metal. All ductwork including fittings and components shall conform to SMACNA HVAC Duct Construction Standards. Seal class shall be as recommended by SMACNA. Pressure sensitive tape shall not be used as a sealant. All ductwork designated to be constructed at a duct pressure class 2-inch water gauge or greater shall be pressure tested. Any advices (filters, fan, coils, or other components) in the air supply, return, or exhaust system that will normally operate at these pressures shall be included in the test. The maximum allowable leakage rate shall be in accordance with the SMACNA Leakage Test Manual. Test procedure, apparatus, and report shall conform to SMACNA. Exposed ductwork shall be spiral seam duct, painted with an architectural finish. Outdoor air intake ductwork for SCBA tank fill equipment shall be as recommended by the manufacturer.

10-6.2 Supply diffusers and registers. Diffusers shall be located to ensure that the air distribution will completely cover all surfaces of exterior walls with a blanket of conditioned air or may be of a compact design so long as 'dead spots' within the units are avoided. At least one diffuser shall be provided in each habitable room. Diffusers shall be provided with integral opposed blade damper. Diffusers shall be provided with air deflectors as required for proper air flow in the space. Plastic diffusers are prohibited. Core velocity shall be limited to 600 fpm maximum, with a maximum pressure drop of 0.1 inch water. Airflow from any single diffuser shall be limited to 250 cfm maximum (NC 20 to 25). Ceiling mounted units shall have factory finish to match ceiling color, and be installed with rims tight against ceiling. Sponge-rubber gaskets shall be provided between ceiling or wall and surface-mounted diffusers for air leakage control. Diffuser boots shall be sealed tight to the wall or ceiling they penetrate using duct mastic or caulking. Suitable trim shall be provided for flush- mounted diffusers. Duct collar connecting the duct to diffuser shall be airtight and shall not interfere with volume controller. Wall supply registers shall be installed at least 6 inches below the ceiling. Installed diffusers shall be free of rattles.

10-6.3 Return/exhaust registers and grilles. Grilles shall be fixed horizontal or vertical louver type similar in appearance to the supply diffuser face. Registers shall be provided with integral opposed blade damper. Plastic units are prohibited. Core velocity shall be limited to 400 fpm maximum, with a maximum pressure drop of 0.06 inch water. Grilles shall be provided with sponge-rubber gasket between flanges and wall or ceiling. Register/grille boots shall be sealed tight to the wall or ceiling they penetrate using duct mastic or caulking. Wall return grilles shall be located at least 6 inches

above the floor or below the ceiling.

10-6.4 Flexible duct. Shall be limited to runouts, shall be adequately supported to prevent kinks and shall not exceed 6 feet in length. Runouts shall be pre-insulated, factory fabricated, and conform to NFPA 90 and UL 181.

10-6.5 Fire dampers. Fire dampers shall be located and installed in accordance with NFPA requirements, and shall conform to the requirements of UL 555. Fire dampers shall be automatic operating, and shall be rated for the maximum system velocity and pressure. Fire dampers shall be equipped with a steel sleeve or adequately sized frame installed in such a manner that disruption of the attached ductwork, if any, will not impair the operation of the damper. Dampers shall not reduce the duct or the air transfer opening cross-sectional area. Access doors shall be provided at all fire dampers.

10-6.6 Balancing dampers. Provide in ducts serving each supply, return and exhaust air device.

10-6.7 Access doors. Provide in ductwork and plenums at all air flow measuring devices, automatic dampers, fire dampers, coils, thermostats and other devices requiring service and inspection.

10-7 **CENTRAL HEATING EQUIPMENT** Minimum equipment efficiencies shall be in accordance with DOE Buying Energy Efficient Products Recommendations (refer to www.eren.doe.gov/femp/procurement for recommended efficiencies) or Energy Star.

10-7.1 Hot water boilers. Boilers shall be designed to burn natural gas. Boilers shall be designed, constructed and equipped in accordance with the ASME Boiler Pressure Vessel Code, Section IV, Heating Boilers. The boiler capacity shall be based on the ratings shown in HYI-01 or as certified by the American Boiler Manufacturers Association. Each boiler shall comply with Federal, state, and local emission regulations. Gas fired burners shall be mechanical forced-draft type in conformance with UL 795 or ANSI Z21.13.

10-8 **PIPING SYSTEMS**. Piping systems shall be in accordance with the following subparagraphs. Fittings and valves shall be compatible for the piping systems in which installed. Provide dielectric unions where required. Provide flexible connections where necessary to prevent vibrations from transmitting from equipment to the piping system. Expansion loops, expansion joints and offsets shall provide with adequate anchors and guides where required to prevent excessive forces within the piping systems. All piping shall be properly and adequately supported. Pipe supports shall conform to MSS SP-58 and MSS SP-69.

10-8.1 Refrigerant. Copper tubing shall conform to ASTM B 280 annealed or hard drawn as required. Copper tubing shall be soft annealed where bending is required and hard drawn where no bending is required. Soft annealed copper tubing shall not be used in sizes larger than 1-3/8 inches. Refrigerant piping, valves, fittings, and accessories shall conform to the requirements of ASHRAE 15.

10-8.2 Condensate drain. Shall be copper tubing or PVC pipe.

10-8.3 Heating Water Pipe. Heating water pipe shall be steel or copper. Steel pipe shall conform to ASTM A 53, Schedule 40. Copper pipe shall be conform to ASTM B 88M/ASTM B 88, type K or L.

10-8.4 Chilled Water Pipe. Underground pipe shall be prefabricated, pre-insulated steel or copper. Steel pipe shall conform to ASTM A 53, Grade B, standard weight, black or to ASTM A 106, Grade B, and standard weight. Copper pipe shall conform to ASTM B88, type K or L. Casing shall be Polyvinyl Chloride (PVC) or Polyethylene (PE). PVC casing shall be conform to ASTM D 1784, Class 12454-B with a minimum thickness equal to the greater of 1/100 the diameter of the casing or 60 mils. PE casing shall conform to ASTM D 1248, type III, Class C, Category 3 or 4, Grade P 34 with the minimum thickness of 125 mils. Prefabricated pipe and fittings shall be insulated in the factory. Foam

insulation for prefabricated insulated pipe and fittings shall be polyurethane foam meeting the requirements of ASTM C 591 having a density not less than 2 pounds per cubic foot (pcf). The polyurethane foam shall be not less than 1 inch (in) thick and completely fill the annular space between the carrier pipe and the casing. Aboveground pipe shall be steel or copper. Steel pipe shall conform to ASTM A 53 / A 53M, schedule 40, type E or S, grade A or B. Copper pipe shall conform to ASTM B 88M / ASTM B 88, type K or L. Heating water piping and chilled water piping systems shall be extended through the Medical Bays, and terminated by isolation valves and caps for Phase 2 connection.

10-9 **INSULATION**. Pipe and duct insulation shall be in accordance with ASHRAE 90.1. Equipment insulation shall be a minimum of 2 inch thickness or as necessary to prevent the surface temperature from exceeding 140 degrees F.

10-9.1 Duct insulation. Provide on the exterior of all supply and outside air ducts and plenums and on all return ducts in unconditioned spaces except on internally lined ductwork. Exhaust ductwork does not require insulation. Insulation shall be faced with a vapor barrier material having a performance rating not to exceed 1.0 perm. Insulation, vapor barrier, and closure systems shall be non-combustible as defined in NFPA 255, with a flame-spread rating of not more than 25, and a smoke development rating of not more than 50, as defined in ASTM E-84. Where insulated ducts pass through fire walls, fire partitions, above grade floors, and fire rated chase walls, the penetration shall be sealed with fire stopping materials. 1-1/2” thick coated acoustical lining may be used in lieu of exterior duct insulation.

10-9.2 Pipe. Provide on all aboveground hot and cold piping systems except PVC condensate drains. Insulation shall form a continuous thermal retarder and shall have a vapor retardant to prevent condensation on cold piping systems. Installation shall be with full length units of insulation and using a single cut piece to complete a run. Cut pieces or scraps abutting each other shall not be used. Supply the insulation with manufacturers recommended factory-applied jacket. Piping exposed to weather shall be insulated and an aluminum jacket or PVC jacket shall be applied. Where insulated pipes pass through fire walls, fire partitions, above grade floors, and fire rated chase walls, the penetration shall be sealed with fire stopping materials. Pipe insulation shall be as specified in Chapter 8, PLUMBING.

10-9.3 Equipment. Provide on all equipment when temperatures are below 60 degrees F, above 104 degrees F or where condensation can occur. Insulation shall be suitable for the temperature encountered. Insulation shall be formed or fabricated to fit the equipment. Removable insulation sections shall be provided to cover parts of equipment, which must be opened periodically for maintenance including vessel covers, fasteners, flanges and accessories. Supply the insulation with manufacturer's recommended factory applied jacket.

10-10 **CONTROLS**. Control system shall be DDC. Provide all devices required, including current transducers, transformers, thermostats, sensors, controllers, actuators, control valves, dampers, transmitters, flow meters, etc., to provide a complete and operable system. All thermostats for systems that provide both heating and cooling shall have a deadband of 5 degrees F. All equipment and systems shall be automatically controlled and monitored by the control system. The control system shall be connected to and interface with the new Ft. Lee Honeywell EBI EMCS system. Full software shall be provided to display color graphics, perform diagnostics, change from summer to winter, and unoccupied to occupied, monitor temperatures and alarms, change control point settings, and control equipment start/stop. Control system instructions shall be provided for each system. The instructions shall consist of half-size laminated drawings and shall include the control system schematic, equipment schedule, ladder diagram, sequence of operation, panel arrangement drawings, wiring diagram, and valve and damper schedules. All controllers shall be located in the same room as the equipment or in the Mechanical room. Provide two portable programmable controllers capable of checking and resetting control point settings. Provide one high-quality laptop computer with full color graphics capability and software to run diagnostics, load all programs and data, display and control any AI, DI, AO, DO, or PA point, display and modify database parameters, and enable/disable each

DDC.

10-10.1 Sequence of Operation. Contractor's proposed operating sequences for the HVAC systems shall include setback, ventilation control, ventilation delay start-up mode, and economizer controls. Control sequences shall be fully developed and documented during the design stages.

10-10.2 Emergency air distribution shutoff. Provide emergency shutoff switches in the HVAC control system that can immediately shut down air handling units. The switch location shall be easily accessible by building occupants and located near a point of egress. Boiler shutoff switch shall also be provided in vicinity of Mechanical Room door.

10-11 **TESTING, ADJUSTING AND BALANCING**. Testing, adjusting and balancing of each system shall be the Contractor's responsibility. Testing and balancing of air and hydronic systems shall be accomplished by a firm certified for testing and balancing by the Associated Air Balance Council (AABC) or National Environmental Balancing Bureau (NEBB). Prior to testing, adjusting, and balancing, the Contractor shall verify that the systems have been properly installed and are operating as specified. The TAB contractor shall be an independent firm (not financially associated with any of the subcontractors on this project) hired by the prime contractor. The TAB firm shall additionally perform the following:

a. Final design review (report provided to COR) of HVAC construction documents to insure the HVAC design provides the proper quantity and location of balancing devices and test ports necessary for accurate TAB results.

b. Prior to start of TAB effort the installed systems shall be inspected (report provided to COR) by the TAB firm to insure the system components, which affect the TAB effort, are properly installed and functioning. TAB shall not begin until the TAB firm's final report indicates all necessary corrective actions have been accomplished.

Testing of individual items of equipment shall be performed by a person authorized to perform such testing and startup by the equipment manufacturer. The contractor shall correct all systems and equipment not found in compliance, and shall be responsible for all labor and materials required for this effort. AABC MN-1, NEBB-01, SMACNA-07 or ASHRAE 111 shall be used as the standard for providing testing of air and water systems. The selected standard shall be used throughout the entire project. All recommendations and suggested practices contained in the selected standard shall be considered mandatory. Instrumentation accuracy shall be in accordance with selected standard.

10-11.1 Piping systems. Each piping system including pipe, valves, fittings and equipment shall be hydrostatically tested and proved tight at a pressure of 1-1/2 times the design working pressure, but not less than 100 psi for a period of not less than two hours with no appreciable loss in pressure. Piping shall not be insulated until testing is completed and acceptable. Upon completion of installation and prior to startup, each hydronic system shall be balanced. All balancing data, including deficiencies encountered and corrective action taken, shall be recorded. Following final acceptance of certified reports by the Contracting Officer, the setting of all HVAC adjustment devices shall be permanently marked by the Contractor's balancing engineer so that adjustment can be restored if disturbed at any time.

10-11.2 Air systems. Following adjusting and balancing, duct pressure testing of air systems shall be performed on 10 percent of the systems which have been randomly selected by the Contracting Officer. No additional testing will be required if at least 90 percent of the tested systems pass the air leakage test requirements. If less than 90 percent of the tested systems pass the air leakage test, an additional 10 percent of the systems shall be tested. This process shall continue until 90 percent of the total number of tested systems pass. Where specific systems require special or additional procedures for testing, such procedures shall be in accordance with the standard selected. All data, including deficiencies encountered and corrective action taken, shall be recorded. Following final acceptance of certified reports by the Contracting Officer, the setting of all HVAC adjustment

devices shall be permanently marked by the Contractor's balancing engineer so that adjustment can be restored if disturbed at any time.

10-11.3 Equipment. Each item of equipment provided, including air handling units, blower-coil units, furnaces and air-cooled condensing units shall be tested in accordance with the equipment manufacturer's standard testing procedures. A factory representative shall be present for the startup and testing of each item of equipment. A certified report shall be provided for each item of equipment tested.

10-12 **COMMISSIONING**. All HVAC systems and equipment including controls shall be commissioned in accordance with the following Clauses: 5 (Program-Phase Procedure), 6 (Design Phase), 7 (Construction Phase), 8 (Acceptance Phase) and 12 (Commissioning Documentation) in ASHRAE Guideline 1. The Commissioning Authority (CA), referenced in ASHRAE Guideline 1, shall be hired by the prime Contractor. The CA shall be completely independent from the Contractor and shall not be a Contractor's employee or be an employee or principal of a firm in a business relationship with the Contractor negating such independent status. The roles and responsibilities of the CA are defined in Annex A DIVISION 15 PART 1 Paragraph 1.03 (B.) and shall become part of the contract requirements. Clause 6.2.3 makes reference to Appendix A6.4 for a sample commissioning specification which shall become part of the contract requirements and shall be edited to suit the work to be performed. The CA must meet the following qualifications:

a. Be employed by an AABC or NEBB certified firm.

b. Hold a management position in the firm, be able to represent the firm on all HVAC commissioning matters, and have a reputation of integrity with building owners, consultants and awarding authorities. The CA must have experience equal to either of the following;

1. A Bachelor of Science engineering degree from an accredited college or university with a least five (5) years of experience in performing commissioning of HVAC systems prior to solicitation of this project or

2. A minimum of ten (10) years experience in commissioning of HVAC systems prior to solicitation of this project.

3. The CA shall have experience on a minimum of five (5) projects using the commissioning of facilities in accordance with ASHRAE Guideline 1 for the five phases indicated above. At least two of these projects shall be similar in size with similar HVAC systems to this project.

4. Names and experience of each team member assigned to this project. The person(s) performing each of the five phases shall be included and indicated that each person has performed the function for at least (3) years prior to solicitation of the project.

c. Become NEBB or AABC qualified and/or maintain NEBB or AABC qualification as a TAB supervisor for both AIR and HYDRONIC systems by passing appropriate written and practical TAB examinations.

d. Demonstrate knowledge in the category or categories of HVAC commissioning.

10-13 **TRAINING**. The Contractor shall conduct a training course for the operating for all HVAC operating systems and individual items of equipment. The field instructions shall cover all of the items of equipment provided as well as the overall systems. The training period shall consist of a total of 16 hours of normal working time and shall start after the systems are functionally completed and testing,

adjusting and balancing have been completed. Factory representatives shall be present to assist in training for every item of operating equipment provided. Contractor shall provide two copies of operation and maintenance instructions for each item of equipment provided. Training shall consist of startup, normal operation and shutdown, as well as demonstrations of routine maintenance operations. The Contracting Officer shall be notified at least 14 days prior to date of proposed conduction of the training course.

CHAPTER 11

ENERGY CONSERVATION

Energy conservation alternatives are feasible and should be used. Other portions of the Statement of Work identify the minimum energy requirements. Additional consideration will be given to proposals that exceed those minimum requirements. Clear documentation is required in the proposal when extra consideration is desired. Proposers may be enlisted any of the following energy conserving measures.

11-1 PASSIVE SOLAR APPLICATIONS. Passive solar architectural applications shall routinely be considered as a part of all project designs.

11-1.1 Shading of Glazing. Cooling season shading of glazed surfaces on the east, west and south elevations is required.

11-2 ENERGY RECOVERY EQUIPMENT.

11-2.1 Plate heat exchangers. Unit shall be a factory fabricated and tested assembly for stationary air-to-air energy recovery by transfer of sensible heat from exhaust air to supply air stream. Heat transfer surface shall be constructed of aluminum. Enclosure shall be fabricated from galvanized steel and shall include maintenance access provisions.

11-2.2 Heat recovery coils. Coil assembly shall be factory fabricated and tested air-to-liquid-to-air energy recovery system for transfer of sensible heat from exhaust air to supply air stream. System shall deliver an energy transfer effectiveness without cross-contamination with maximum energy recovery at minimum life cycle cost. Components shall be computer optimized for capacity, effectiveness, number of coil fins per inch, number of coil rows, flow rate and frost control. Coils, pumps, controls and piping materials shall conform to Chapter 10 – HVAC.

CHAPTER 12

FIRE PROTECTION

12-1 **DESIGN STANDARDS AND CODES**. The fire protection design for all facilities shall be in accordance with the current versions of the Design: Fire Protection Engineering For Facilities UFC 3-600-01, International Building Code (IBC) and the National Fire Protection Association (NFPA) standards and codes.

12-1.1 Fire Protection Engineer. The contractor shall provide the services of a qualified fire protection engineer who 1) has a Bachelor of Science or Master of Science degree in Fire Protection Engineering with a minimum of 5 years experience in fire protection engineering, 2) is a registered professional engineer (P.E.) who has passed the NCEE Fire Protection Engineering written examination or 3) is a registered P.E. in a related engineering discipline with a minimum of 5 years experience dedicated to fire protection engineering. The Fire Protection Engineer shall be an integral part of the design team and shall be involved in all aspects of the design of the fire protection system.

12-1.2 Fire Protection and Life Safety Analysis. The fire protection engineer shall perform a fire protection and life safety design analysis of the facility design. The analysis shall be submitted with the preliminary design submittal. The analysis shall include type of construction; height and area limitations; classification of occupancy; building separation or exposure protection; specific compliance with NFPA codes and the UBC; requirements for fire-rated walls, doors, fire dampers, etc.; analysis of automatic suppression systems and protected areas; water supplies; smoke control systems; fire alarm system, including connection to the base-wide system; fire detection system; standpipe systems; fire extinguishers; interior finish ratings; and other pertinent fire protection data. The submittal shall include a life safety floor plan showing occupant loading, occupancy classifications and construction type, egress travel distances, exit capacities, sprinklered areas, fire extinguisher locations, ratings of fire-resistive assemblies, and other data necessary to exhibit compliance with life safety code requirements.

12-2 **HYDRANT FLOW DATA**.

12-2.1 Current hydrant flow test data shall be used in the hydraulic analysis and as the basis for the design of the sprinkler system, underground supply mains, and fire hydrants. Based on a May 16, 2003 flow test taken at hydrant 26, located at 5th St. and A Ave, there is 81 PSI of static pressure and 76 PSI of residual pressure at a flow of 2106 GPM from hydrant 25 located at 4th St. and A Ave. Based on a May 16, 2003 flow test taken at hydrant 29, located at 5th St. and B Ave, there is 85 PSI of static pressure and 75 PSI of residual pressure at a flow of 2556 GPM from hydrant 22 located at 4th St. and B Ave.

12-3 **SPRINKLER SYSTEM**.

12-3.1 Wet pipe sprinkler system. The entire building shall be protected by a wet pipe sprinkler system. Sprinkler system if required shall be designed and installed in accordance with the provisions of NFPA 13, Standard for the Installation of Sprinkler Systems except that design area shall be 3000 square feet and the design density and hose stream allowance shall be 0.10 GPM/square foot and 250 GPM hose allowance for Light Hazard occupancy, 0.15 GPM/square foot and 500 GPM hose allowance for Ordinary Hazard Group 1 occupancy, and 0.20 GPM/square foot and 500 GPM hose allowance for Ordinary Hazard Group 2 occupancy. Provide hydraulic calculations to support design of the system. Contractor shall recheck flow and pressure data from hydrants serving the area.

12-3.2 Sprinkler Heads. All sprinkler heads located in finished areas shall be recessed pendent type. All exposed ceiling areas shall be upright.

12-4 FIRE ALARM. Provide fire detection and alarm system conforming to requirements of NFPA 72 and NFPA 101. Fire alarm system shall be addressable (intelligent) and consist of detectors as required by NFPA requirements, pull stations, audiovisual devices, control/annunciation panel and tamper and/or flow connection/supervision to the sprinkler system. Coordinate requirements with Ft Lee DEL POC, Bill Beasley, 804-734-5022. Fire alarm system shall tie into the base-wide fire reporting system. Existing fire reporting system is a Monaco radio-type. Provide Monaco type BT-X communicator installed in accordance with the manufacturer's requirements. Coordinate specific transmitter and antenna requirements with the Fort Lee Fire Chief (Bldg T-8036, 804-765-3699).

12-4.1 Fire alarm panel shall be the analog addressable type that will provide for individual identification of each installed device. The control shall be UL listed for this application. Control units for which proprietary laptop programming is required and factory certified programming training, programming software, and job specific program files that are not made available are not allowed. After the completion of the system the following shall be turned over to DEL at no extra cost:

Complete installation manual.
Complete programming manual and work sheets.
Complete programming software and training after warranty expiration.
Complete as-built drawings and as-built job program file.

12-4.2 Provide a single station ceiling mounted 120 VAC powered smoke detector and alarm in each sleeping room.

Provide HVAC duct detectors in accordance with NFPA requirements.

CHAPTER 13

SUSTAINABLE DESIGN

13-1 SUSTAINABLE DESIGN GOALS. The goals for improving the sustainability of facilities include: (a) use resources efficiently and minimize raw material resource consumption, including energy, water, land and materials, both during the construction process and throughout the life of the facility, (b) maximize resource reuse, while maintaining financial stewardship, (c) move away from fossil fuels towards renewable energy sources, (d) create a healthy and productive work environment for all who use the facility, (e) build facilities of long-term value, and (f) protect and, where appropriate, restore the natural environment.

13-2 PROJECT REQUIREMENTS. Sustainable design techniques shall be considered as they relate to site and building design, construction, and operation. Techniques which conserve energy, improve livability, and can be justified by life cycle cost analysis as cost effective are encouraged.

13-2.1 Sustainable design is a proposal evaluation sub-factor. The level of incorporation of sustainable design principles shall be measured through use of the Sustainable Project Rating Tool (SPiRiT), available from the following website: http://www.cecer.army.mil/SustDesign/ SPiRiT. SPiRiT is the government version of the LEED Green Building Rating System™, developed by the U.S. Green Building Council.

13-2.2 Each Offeror will complete and submit the SPiRiT Facility Points Summary with the proposal; the total point score will determine the SPiRiT Sustainable Project Certification Level: SPiRiT Gold, or Platinum.

13-2.3 Proposals that do not achieve a SPiRiT Gold certification level (minimum of 50 points and all required items) in the completed project will be considered non-conforming.

13-2.4 Proposals that do not comply with the “Required” criteria listed in the SPiRiT document will be considered non-conforming. For example: SPiRiT category *3.R3 CFC Reduction in HVAC&R Equipment* requires zero use of CFC-based refrigerants in new mechanical systems. Although no credit points are available, the requirement must be met to achieve the minimum certification level.

13-2.5 Some SPiRiT categories award potential points (credits) for strategies or decisions that are not within the control of the Offeror. These areas may include installation master planning, site selection, or involving facility users in the programming process. The Offeror will receive points in the following credit categories for criteria met by the government:

1.C1	Site Selection – 2 points.
1.C2	Installation/Base Redevelopment – 2 points.
1.C10	Facility Impact – 1 point.
7.C2	Soldier and Workforce Productivity and Retention – 3 points.
8.C1	Functional Life of Facility and Supporting Systems – 2 points.
8.C2	Adaptation, Renewal and Future Uses – 2 points.

Additional points in the above sub-categories will not be allowed. Other than the credits stated in this paragraph, the Offeror shall not receive consideration for any SPiRiT criteria that cannot be substantiated by information contained in the proposal, and later in the design.

13-2.6 Design After Award. During the Design phase following contract award provide a revised Facility Points Summary with a brief narrative describing how each point was obtained. Also, provide an estimated construction cost difference for achieving the required Gold or Platinum level over a Bronze level (which is considered no cost impact).

APPENDIX A

REFERENCES

GOVERNMENT PUBLICATIONS:

Unified Facilities Criteria	UFC 1-200-01 Design: General Building Requirements
Code of Federal Regulations Government Printing Office Washington, DC 20402	49 CFR 192 Transportation of Natural and other Gas by Pipeline: Minimum Federal Safety Standards 40 CFR 280 Owners and Operators of Underground Storage Tanks 49 CFR 195 Transportation of Hazardous Liquids by Pipeline 10 CFR 430 Energy Conservation Program for Consumer Products
Department of the Navy	
Standardization Documents Order Desk 700 Robbins Avenue, Bldg. 4D Philadelphia, PA 19111-5094	MIL-HDBK-1008, Fire Protection for Facilities Engineering, Design, and Construction
U.S. Government Printing Office	
Superintendent of Documents U.S. Government Printing Office Washington, DC 20402	U.S. Government Printing Office (GPO) Style Manual

NON-GOVERNMENT PUBLICATIONS:

Air Movement and Control Association 30 W. University Drive Arlington Heights, IL 60004-1893	AMCA 210 (1985) Laboratory Methods of Testing Fans for Rating
Air Conditioning and Refrigeration Institute 4301 North Fairfax Drive Arlington, VA 22203	ARI 310/380 (1993) Packaged Terminal Air-Conditioners and Heat Pumps ARI 440 (1998) Room Fan-Coil and Unit Ventilator ARI 445 (1987; R 1993) Room Air-Induction Units ARI 880 (1998) Air Terminals

American Architectural Manufacturers Association (AAMA) 1827 Walden Office Square, Suite 104 Schaumburg, IL 60173-4268	AAMA 101 Voluntary Specifications for Aluminum, Vinyl and Wood Windows and Glass Doors
	AAMA 605 Voluntary Specification Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels
	AAMA 607.1 Voluntary Guide Specifications and Inspection Methods for Clear Anodic Finishes for Architectural Aluminum
	AAMA 1503 Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors, and Glazed Wall Sections
American Bearing Manufacturers Association 1200 19th Street, NW Washington, DC 20036-4303	AFBMA Std 9 (1990) Load Ratings and Fatigue Life for Ball Bearings
	AFBMA Std 11 (1990) Load Ratings and Fatigue Life for Roller Bearings
American Boiler Manufacturers Association (ABMA) 950 N. Glebe Rd, Suite 160 Arlington, VA 22203-1824	ABMA ISEI Industry Standards and Engineering Information
American National Standards Institute 11 West 42 Street New York, NY 10036	ANSI Z21.10.1 (1993; Z21.10.1a; Z21.10.1b; Z21.10.1c) Gas Water Heaters Vol. I, Storage Water Heaters with Input Ratings of 75,000 Btu Per Hour or Less
	ANSI Z124.3 (1995) American National Standard for Plastic Lavatories.
	ANSI Z124.6 (1997) Plastic Sinks
	ANSI Z21.45 (1995) Flexible Connectors of Other Than All-Metal Construction for Gas Appliances
	ANSI C2 (1997) National Electrical Safety Code
	ANSI 70 (1996) National Electrical Code
	ANSI/TIA/EIA-569-A (1998) Commercial Building Standard for Telecommunications Pathways and Spaces

American Society for Testing and Materials
100 Bar Harbor Drive
West Conshohocken, PA 19428-2959

ASTM E84 (2000) Surface Burning Characteristics of Building Materials

ASTM D 2846/D 2846M (1999) Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Hot- and Cold-Water Distribution Systems

ASTM D 2513 (1999; Rev. A) Thermoplastic Gas Pressure Pipe, Tubing, and Fittings

ASTM D 2683 (1998) Socket-Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing

ASTM A 53 (1999) Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless

ASTM A 106 (1999) Seamless Carbon Steel Pipe for High-Temperature Service

ASTM B 88 (1999) Seamless Copper Water Tube

ASTM D 5686 (1995) "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe and Pipe Fittings, Adhesive Bonded Joint Type Epoxy Resin, for Condensate Return Lines

ASTM D 2241 (1996b) Poly(Vinyl Chloride) (PVC) Pressure-Rated-Pipe (SDR Series)

ASTM D 1784 (1999a) Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds

ASTM D 1248 (1998) Polyethylene Plastics Molding and Extrusion Materials

ASTM C 591 (1994) Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation

ASTM C 518 (1998)Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus

ASTM A 134 (1996) Pipe, Steel, Electric-Fusion (Arc)-Welded (Sizes NPS 16 and Over)

	ASTM A 135 (1997c) Electric-Resistance-Welded Steel Pipe
	ASTM A 139 (1996el) Electric-Fusion (Arc)-Welded Steel Pipe (NPS 4 and over)
	ASTM A 36/A 36M (2000) Carbon Structural Steel
	ASTM D 2310 (1997) Machine-Made "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe
	ASTM D 2996 (1996; Rev. A) Filament-Wound "Fiberglass" (Glass-Fiber-Reinforced Thermosetting Resin) Pipe
American Society of Heating, Refrigerating and Air Conditioning Engineers 1791 Tully Circle. NE Atlanta, GA 30329-2305	ASHRAE 90.1 (1989; 90.1b; 90.1c; 90.1d; 90.1e; 90.1g; 90.1i 90.11-1995; 90.1m-1995; 90.1n-1997) Energy Efficient Design of New Buildings Except Low-Rise Residential Buildings
	ASHRAE Hdbk-IP (1997) Handbook, Fundamentals I-P Edition
American Society of Mechanical Engineers International Three Park Place New York, NY 10016-5990	ASME B31.8 (1995) Gas Transmission and Distribution Piping Systems
	ASME B16.11 (1996) Forged Fittings, Socket-Welding and Threaded
	ASME B31.1 (1998; Addenda 1999 and 2000) Power Piping
	ASME BPVC SEC VII (1995; Addenda 1995, 1996, and 1997) Boiler and Pressure Vessel Code: Section VII Recommended Guidelines for the Care of Power Boilers
	ASME (1996) Pipe Flanges and Flanged Fittings NPS 1/2 Through NPS 24
Architectural Woodwork Institute 1952 Isaac Newton Square W. Reston, VA 20190	AWI Quality Standards (1999) 7th Edition, Version 1.2
Associated Air Balance Council 1518 K Street NW, Suite 708 Washington, DC 20005	AABC MN-1 (1989) National Standards for Testing and Balancing Heating, Ventilating, and Air Conditioning Systems

Builders Hardware Manufacturers Association 355 Lexington Ave, Suite 1700 New York, NY 10017-6603	ANSI/BHMA A156.4 (2000) American National Standards for Door Controls - Closers…
Council of American Building Officials 5203 Leesburg Pike, Suite 708 Falls Church, VA 22041	CABO A117.1 (1992; Errata Jun 1993) Accessible and Usable Buildings and Facilities
Electronic Industries Association (EIA) 2500 Wilson Blvd Arlington, VA 22201-3834	EIA/TIA 568-B (Latest Edition) Commercial Building Telecommunications Cabling Standards
	EIA/TIA 569-A (Latest Edition) Commercial Building Standard for Telecommunications Pathways and Spaces
Illuminating Engineering Society of North America 120 Wall Street, 17th Floor New York, NY 10005-4001	IESNA RP-8 (1983; R 1993) Roadway Lighting
	IES LHBK (Latest Edition) Lighting Handbook, Reference and Application
Institute of Electrical and Electronics Engineers Inc. (IEEE) 445 Hoes Lane, P.O. Box 1331 Piscataway, NJ 08855-1331	Standard for Use of the International System of Units (SI): the Modern Metric System
International Approval Services (IAS) 8501 E. Pleasant Valley Rd Cleveland, OH 44131	IAS Directory (1999) IAS Directory of AGA & CGA Certified Appliances and Accessories
International Association of Plumbing and Mechanical Officials 20001 Walnut Drive South Walnut, CA 91789-2825	IAPMO Z124.1 (1995) Plastic Bathtub Units
	IAPMO Z124.3 (1995) Plastic Lavatories
	IAPMO Z124.5 (1997) Plastic Toilet (Water Closets) Seats
	IAPMO Z124.9 (1994) Plastic Urinal Fixtures
International Code Council, Inc. 5203 Leesburg Pike, Suite 708 Falls Church, VA 22041-3401	ICC (2000) International Building Code
National Association of Corrosion Engineers International 1440 South Creek Drive Houston, TX 77084-4906	NACE RP0169 (Latest Edition) Control of External Corrosion on Underground or Submerged Metallic Piping Systems
	NACE RP0185 (Latest Edition) Extruded, Polyolefin Resin Coating Systems with Soft

	Adhesives for Underground or Submerged Pipe
National Association of Plumbing - Heating – Cooling Contractors 180 S. Washington Street Falls Church, VA 22046	NAPHCC Plumbing Code (1996) National Standard Plumbing Code
National Electrical Manufacturers Association 1300 N 17th Street, Suite 1847 Rosslyn, VA 22209	NEMA C12.1 (Latest Edition) Code for Electricity Metering
	NEMA LD3 High Pressure Decorative Laminates
	NEMA PB 1 (Latest Edition) Panelboards
National Environmental Balancing Bureau 8575 Grovemont Circle Gaithersburg, MD 20877-4121	NEBB Procedural Stds (1991) Procedural Standards for Testing Adjusting Balancing of Environmental Systems
National Fire Protection Association One Batterymarch Park Quincy, MA 02269-9101	NFPA 10 (1998) Standard for Portable Fire Extinguishers
	NFPA 30 (2000) Flammable and Combustible Liquids Code
	NFPA 31 (1997; TIA 97-11) Installation of Oil Burning Equipment
	NFPA 54 (1999) National Fuel Gas Code
	NFPA 58 (1998; Errata 58-98-1) Liquefied Petroleum Gas Code
	NFPA 70 (2002) National Electrical Code
	NFPA 80 (1999) Standard for Fire Doors and Fire Windows
	NFPA 90A (1993) Installation of Air Conditioning and Ventilating Systems
Plumbing and Drainage Institute 45 Bristol Drive, Suite 101 South Easton, MA 02375	PDI G 101 (1996) Testing and Rating Procedure for Grease Interceptors with Appendix of Sizing and Installation Data
	PDI WH201 (1992) Water Hammer Arrestors
	PDI WH 201 (1992) Water Hammer Arresters
Sheet Metal and Air Conditioning Contractor's National Association PO Box 221230	SMACNA HVAC Duct Const Stds (1995; Addenda Nov 1997)) HVAC Duct Construction Standards - Metal and Flexible

Chantilly, VA 20153-1230	
	SMACNA Arch. Manual (1993; Errata; Addenda Oct 1997) Architectural Sheet Metal Manual
Steel Door Institute (SDI) 30200 Detroit Road Cleveland, OH 44145-1967	ANSI A250.8/SDI 100 Standard Steel Doors and Frames
Steel Tank Institute (STI) 570 Oakwood Rd Lake Zurich, IL 60047	STI P3 Underground Steel Storage Tank Protection
Underwriters Laboratories 333 Pfingsten Road Northbrook, IL 60062-2096	UL 430 (1994; Rev thru Nov 1996) Waste Disposers
	UL 567 (1996; Rev thru Oct 1997) Pipe Connectors for Petroleum Products and LP-Gas
	UL 1746 (1993; Rev thru Sep 1998) External Corrosion Protection Systems for Steel Underground Storage Tanks
	UL 1995 (1995; Rev thru Aug 1999) Heating and Cooling Equipment
	UL 507 (1999) Electric Fans
	UL 608 Modular Vault Panels
	UL 746C (1995; Rev thru Jul 1999) Polymeric Materials - Use in Electric Equipment Evaluations
	UL 705 (1994; Rev thru Feb 1999) Power Ventilators
	UL 1316 (1994; Rev Apr 1996) Glass-Fiber-Reinforced Plastic Underground Storage Tanks for Petroleum Products, Alcohols, and Alcohol-Gasoline Mixtures

end

LIST OF ATTACHMENTS TO THE STATEMENT OF WORK

NUMBER DESCRIPTION

1. SPECIFICATIONS

Contract Sections

Section 00110	Proposal Submission Requirements and Instructions
Section 00120	Proposal Evaluation and Contract Award

Technical Sections

Section 01005	Special Work Requirements and Restrictions
Section 01012	Design After Award
Section 01111	Safety and Health Requirements
Section 01200	Project Meetings
Section 01312	Quality Control System
Section 01320	Project Schedule
Section 01330	Submittal Procedures
Section 01355	Enviromental Protection
Section 01451	Contractor Quality Control
Section 01500	Temporary Construction Facilities
Section 01525	Safety and Health Requirements
Section 01780	Closeout Submittals

2. SITE AND LOCALITY MAPS

3. LIST OF RFP DESIGN DRAWINGS

T-1	Title Sheet
C-1	Location Plan
C-2	Site and Utility Layout
C-3	Topographic Survey
A-1	Phase 1 Plan
A-2	Phase 2 Plan
A-3	Phase 1 Furniture Plan
A-4	Phase 2 Furniture Plan
A-5	Elevations
A-6	Elevations
A-7	Elevations
E-1	Electrical and Communication Site Plan
S-1	Master Plan

4. GEOTECHNICAL INFORMATION

5. FORT LEE INSTALLATION DESIGN GUIDE

6. PLANT LIST

7. INVASIVE PLANT AND INSECT GUIDANCE

8. ROOF WARRANTY

9. STORMWATER PACKAGE

10. EXTERIOR SIGN

11. ANTI-TERRORISM FORCE PROTECTION CRITERIA

12. EQUIPMENT YARD

ATTACHMENT1
SPECIFICATIONS

ATTACHMENT 1

SPECIFICATIONS

This attachment contains specifications related to the design-build process.

The following specifications are included in the RFP attachments:

SPECIFICATIONS

Contract Sections

Section 00110	Proposal Submission Requirements and Instructions
Section 00120	Proposal Evaluation and Contract Award

Technical Sections

Section 01005	Special Work Requirements and Restrictions
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Section 01451	Contractor Quality Control
Section 01500	Temporary Construction Facilities
Section 01525	Safety and Health Requirements
Section 01780	Closeout Submittals

SECTION 00110
PROPOSAL SUBMISSION REQUIREMENTS AND INSTRUCTIONS

1.00 GENERAL PROPOSAL INFORMATION.

a. General. Inasmuch as the proposal will describe the capability of the Offeror to perform any resultant contract, as well as describe the understanding of the requirement of the Statement of Work, it should be specific and complete in every detail. The proposal should be prepared simply and economically, providing straightforward, concise delineation of capabilities to perform satisfactorily the contract being sought. The proposal should therefore be practical, legible, clear and coherent.

b. Proposal Submissions and the Two (II) Phase Design-Build Selection Process. This process requires potential contractors to submit their performance and capability information initially for review and consideration by the Government. Following the review, evaluation, and rating of these proposals, the Government will select up to five of the highest rated contractors to receive the technical portions of this solicitation, and provide a technical and cost proposal for consideration by the Government. The technical information contained in the Phase II proposal will be reviewed, evaluated, and rated by Government staff in direct response to the evaluation criteria set forth in Section 00120 – PROPOSAL EVALUATION CRITERIA. The final evaluation rating used for comparison, selection, and award will reflect both the rating received in Phase I and the evaluation rating received in Phase II. Cost information will not be rated in either phase but will be evaluated for realism and balance. The proposal process for this two (2) phase procurement consists of the following individual pieces:

<u>PHASE I PROPOSAL</u>

- Offeror Relevant Experience (Example Projects)
- Offeror Past Performance Information (Completed Projects Customer Surveys)
- Offeror Project Key Personnel
- Technical Approach Narrative
- Other Information (Any additional information – background provided by the Offeror)

<u>PHASE II PROPOSAL</u>

- Pro Forma Information
- Statement of Compliance
- Completed Price Proposal Information
- Technical Proposal Information
- Project Management Plans and Schedules
- Offeror Sub Contracting Plan
- Other Information (Any additional information – background provided by the Offeror)

<u>NOTE: FOR ALL THOSE CONTRACTORS WHO COMPETE IN BOTH PHASE I AND PHASE II, THE CONTRACTOR'S PROPOSAL SHALL BE DEFINED AS: ALL INFORMATION WHICH WAS SUBMITTED IN RESPONSE TO THE REQUIREMENTS OF BOTH PHASES OF THE SOLICITATION.</u>

2.00 PHASE I PROPOSAL SUBMISSION INSTRUCTIONS

a. Who May Submit.

(1) Proposals may be submitted by: firms formally organized as design/build entities, or by design firms and construction contractors that have associated specifically for this project. In the latter case, a single design firm or construction contractor may offer more than one proposal by entering into more than one such association. For the purpose of this solicitation, no distinction is made between formally organized design/build entities and project-specific design/build associations. Both are referred to as the design/build Offeror, (or simply "Offeror"), or the design/build contractor, (or simply "Contractor"), after award of a contract.

(2) Any legally organized Offeror may submit a proposal, provided that the Offeror, or Offeror's subcontractor, has on its permanent staff professional architects and engineers registered in the appropriate technical disciplines and provided that the requirements specified in the solicitation are met. All designs must be accomplished under the direct supervision of appropriately licensed professionals.

b. General Requirements.
In order to effectively and equitably evaluate all proposals, the Contracting Officer must receive information sufficiently detailed to allow review and evaluation by the Government. The proposals shall contain a detailed table of contents. If more than one binder is used, the complete table of contents shall be included in each. Any materials submitted but not required by this solicitation, (such as company brochures), shall be relegated to appendices.

c. Size of Printed Matter Submissions.

Written materials: Size A4 [or 8-1/2" x 11"] format.

d. Where to Submit. Offerors shall submit five (5) proposal packages to the Norfolk District at the address shown in Block 8 of Standard Form 1442.

e. Submission Deadline. Proposals shall be received by the Norfolk District no later than the time and date specified in Block 13 of Standard Form 1442.

f. Proposal Requirements and Submission Format. The proposals sought by this solicitation shall contain the categories of submittal information as follows:

(1) Offeror Relative Experience. Provide examples (at least three) of projects for which the Offeror has been responsible. The examples should be as similar as possible to this solicitation in project type and scope. Provide references (with contact names and telephone numbers) for all examples cited. Each example shall indicate the general character, scope, location, cost, and date of completion of the project. If the Offeror represents the combining of two or more companies for the purpose of this RFP, each company shall list project examples. Example projects must have been completed not later than five years from the date of the solicitation.

(2) Offeror Past Performance Information. At the end of this paragraph is included the sample Past Performance Evaluation Questionnaire. The Offeror shall identify three in-progress or completed projects to be used for reference and evaluation purposes. Provide a questionnaire to the Point of Contact for each project listed for completion. When completed, these forms shall be mailed or faxed to the Norfolk District Contract Specialist identified in the sample

transmittal letter provided. Failure of reference verification to arrive at the Norfolk District within the identified time period shall adversely affect the overall rating received in Phase I of this project. It is the contractor's responsibility to ensure that the reference documentation is provided, the Government WILL NOT make additional requests for past performance information or references. Copies of the evaluation form SHALL NOT be provided to the Offeror from the reference. Projects from which questionnaires are received shall have been completed within five years of the date of the solicitation.

(3) Project Key Personnel. Provide the names, resumes, and levels of responsibility of the principal managers and technical personnel who will be directly responsible for the day-to-day design and construction activities. Include, as a minimum, the project manager; the project architect; the engineers responsible for civil, electrical, mechanical and structural design; the quality control manager; and the construction superintendent. If reassignment of personnel is considered possible, provide the names and resumes of the alternative professionals in each assignment. Project key personnel shall include the key construction subcontractors and the extent of their role with respect to the design phases of this project. Key subcontractors shall include, but are not limited to: Electrical, Mechanical, and Site Development subcontractors. Indicate by use of a matrix whether each individual or subcontractor had a significant part in any of the project examples cited.

(4) Technical Approach Narrative. Describe in general terms how the Offeror will approach the design and construction of these facilities. The roles and responsibilities of the various sub-contractors for both design and construction shall also be addressed. Include in the narrative the Offeror's proposed processes for handling field problems and assuring Designer of Record involvement throughout the construction period. Technical Approach Narrative shall be limited to a maximum of five (5) typewritten pages.

(5) No cost information shall be included in the Phase I proposal package.

SAMPLE TRANSMITTAL LETTER
AND
PAST PERFORMANCE EVALUATION QUESTIONNAIRE

Date: _____

To: _____
_____
_____

We have listed your firm as a reference for work we have performed for you as listed below. Our firm has submitted a proposal under a project advertised by the U.S. Army Corps of Engineers, Norfolk District. In accordance with Federal Acquisition Regulations (FAR), an evaluation of our firm's past performance will be completed by the Corps of Engineers. Your candid response to the attached questionnaire will assist the evaluation team in this process.

We understand that you have a busy schedule and your participation in this evaluation is greatly appreciated. Please complete the enclosed questionnaire as thoroughly as possible. Space is provided for comments. Understand that while the responses to this questionnaire may be released by the Government to the Offeror, FAR 15.306 (e)(4) prohibits the release of the names of the persons providing the responses. Complete confidentiality will be maintained. Furthermore, a questionnaire has also been sent to _____ of your organization. Only one response from each office is required. If at all possible, we suggest that you individually answer this questionnaire and then coordinate your responses with that of _____, to forge a consensus on one overall response from your organization.

Please send your completed questionnaire to the following address:

U.S. Army Engineer District, Norfolk
ATTN: Cherie A. Kunze
803 Front Street
Norfolk, Virginia 23510

The questionnaires can also be faxed to Ms. Kunze at (757) 441-7078
If you have questions regarding the attached questionnaire, or require assistance, please contact Ms. Kunze at e-mail Cherie.A.Kunze@nao02.Usace.army.mil or phone (757) 441-7132.
Thank you for your assistance.

PAST PERFORMANCE EVALUATION QUESTIONNAIRE

Upon completion of this form, please send directly to the U.S. Army Corps of Engineers in the enclosed addressed envelope ATTN: Ms. Kunze, or fax to Ms. Kunze at (757) 441-7078or e-mail Cherie.A.Kunze@nao02.Usace.army.mil, or phone Ms. Kunze at (757) 441-7132. Do not return this form to the Contractor's offices. Thank you.

1. Contractor/Name & Address (City and State):

2. Type of Contract: Fixed Price _____ Cost Reimbursement _____
Other (Specify) _____

3. Title of Project/Contract Number:
_____
_____
_____

4. Description of Work: (Attach additional pages as necessary)

5. Complexity of Work: High _____ Mid _____ Routine _____

6. Location of Work: _____

7. Date of Award: _____

8. Status: Active _____ (provide percent complete)
Complete _____ (provide completion date)

9. Name, address and telephone number of Owner or Contracting Officer's Technical Representative:

QUALITY OF PRODUCT/SERVICE:

10. Evaluate the contractor's performance in complying with contract requirements, quality achieved and overall technical expertise demonstrated.

Excellent Quality	
Above Average Quality	
Average Quality	
Below Average Quality	
Unsuccessful or Experienced Significant Quality Problems	

Remarks:

_____
_____
_____
_____

11. To what extent were the contractor's reports and documentation accurate, complete and submitted in a timely manner?

Excellent Quality	
Above Average Quality	
Average Quality	
Below Average Quality	
Unsuccessful or Experienced Significant Quality Problems	

Remarks: _____
_____
_____
_____

12. To what extent was the contractor able to solve contract performance problems without extensive guidance from government/owner counterparts?

Excellent	
Above Average	
Average	
Below Average	
Unsuccessful	

Remarks:

_____
_____
_____
_____

13. How well did the contractor manage and coordinate subcontractors, suppliers, and the labor force?

Excellent	
Above Average	
Average	
Below Average	
Unsuccessful	

Remarks:

_____
_____
_____

CUSTOMER SATISFACTION:

14. To what extent were the end users satisfied with:

	Design Quality	Construction Quality	Cost Performance	Schedule
Exceptionally Satisfied				
Highly Satisfied				
Satisfied				
Somewhat Dissatisfied				
Highly Dissatisfied				

Remarks:

_____
_____
_____
_____

15. If given the opportunity, would you work with this contractor again?

Yes _____ No _____ Not Sure _____

TIMELINESS OF PERFORMANCE:

16. To what extent did the contractor meet the task order schedules?

Completed Substantially Ahead of Schedule	
Completed on Schedule with no Time Delays	
Completed on Schedule with Minor Delays Under Extenuating Circumstances	
Experienced Significant Delays without Justification	

Remarks: _____
_____
_____
_____

OTHER REMARKS:

17. Use the space below to provide additional information related to the contractor's performance. This may include the contractor's selection and management of subcontractors, flexibility in dealing with contract challenges, their overall concern for the Owner's interest (if applicable), project awards received, etc.

_____
_____
_____
_____
_____
_____
_____
_____

3.00 PHASE II PROPOSAL SUBMISSION INSTRUCTIONS

a. Who May Submit.

(1) Proposals may be submitted by the Offerors who receive written notification from the Norfolk District Contracting Officer that their firm has been selected to participate in Phase II of this solicitation. No more than five Offerors will compete in Phase II under typical circumstances

b. General Requirements.

(1) In order to effectively and equitably evaluate all proposals, the Contracting Officer must receive information sufficiently detailed to clearly indicate the materials, equipment, methods, functions, and schedules proposed.
(2) In addition to the design documents addressed below, proposals must contain financial terms, management information, schedules for design and construction, and the representations and certifications.

c. Specific requirements are described below.

(1) Title Page, including the title of the solicitation, solicitation number, Offeror name, and date of the submittal.

(2) The proposals shall contain a detailed table of contents. If more than one binder is used, the complete table of contents shall be included in each. Any materials submitted but not required by this solicitation, (such as company brochures), shall be relegated to appendices.

(3) Compliance Statement: The Offeror is required to certify that all items submitted in the technical proposal comply with the RFP requirements and any differences, deviations or exceptions must be stated and explained in this section. Offerors are required to complete the statement and submit it with their technical proposal. Even if there are no differences, deviations or exceptions, the Offeror must submit the Compliance Statement and state that none exist.

<u>Statement of Compliance:</u>

This Offeror hereby certifies that all items submitted in this proposal and final design documents (after contract award) comply with the solicitation requirements. The criteria specified in Solicitation No. DACA 65-03-R-0014 are binding contract criteria and in case of any conflict after award, between DACA65-03-R-0014 and the contractor's proposal, the solicitation criteria shall govern unless there is a written and signed agreement between the contractor and the Government waiving a specific requirement.

Should this proposal result in the award of a contract; this statement will be included on each sheet of drawings and on the cover of the specifications.

d. Exceptions to the contractual terms and conditions of the solicitation (e.g., standard company terms and conditions) must not be included in the proposal.

e. The technical proposal shall not include any cost information. The technical and cost proposals shall be submitted as two separate documents.

f. Size of Printed Matter Submissions.

(1) Written materials: Size A4 [or 8-1/2" x 11"] format.

(2) Drawing sheets: Use Size A1 [approximately 24" x 36"] for full size drawings.

g. Where to Submit. Offerors shall submit Phase II proposal packages to the Norfolk District at the address indicated.

h. Submission Deadline. The Norfolk District shall receive proposals no later than the time and date specified.

i. Proposal Requirements and Submission Format. The proposals sought by this solicitation shall contain the categories of submittal information as follows:

(1) Pro Forma requirements. This information should be submitted in an envelope labeled "Pro Forma Requirements." This category consists of representations and certifications, subcontracting plan, proposal bonds, and completed Standard Form 1442. Provide original and one (1) copy.

(2) Price Proposal Information. Offeror shall complete all portions of the Price Proposal Schedule and furnish in a separate envelope in original and two copies.

(3) Design-Technical. This information shall be submitted in separate three-ring binders labeled "Design-Technical Information." This category consists of design documents, drawings, sketches, outline specifications, catalog cuts, and other information. Provide four (4) copies of the drawings (size A1); or four (4) copies of half size drawings (size A2) with a minimum of one full size set; 1 set of color boards; and four (4) copies of catalog cuts and other technical data. The drawings shall be bound.

k. Technical Data Requirements for Proposal Submission. The following technical data shall be submitted as part of the formal proposal. Proposals shall include graphic description of the design included in the basic proposal clearly indicated as such. Offerors are advised that the required data listed below will be utilized for technical review and evaluation and used for determination of a "Quality Rating" by a Technical Evaluation Team. Materials indicated in the design/construction criteria, but not indicated in the Offeror's specifications, will be assumed to be included and a part of the proposal.

(1) Design drawings. Provide an index of drawings. Foundation plans or structural, civil, plumbing, mechanical, or electrical details are not required. The proposal design drawings shall provide the information as indicated in the following tables:

SITE DESIGN

Drawing Type / Scale	Show This Information
Area Site Development Plan (Scale as suited)	Spatial and functional arrangement of all requirements Project Boundaries Existing Contours Proposed contours at 1-foot intervals [1']. Drainage and water retention ponds (if utilized) Vehicular and pedestrian circulation Parking Areas and Curbing
Landscape Planting Plans (Scale as suited)	Site Landscape Design. Botanical/Common Names of plants used, size, and quantity of trees, shrubs, ground covers, and related notes.
Utility Plan (Scale as suited)	All site utility requirements including sewer, water, gas, and fire protection Site lighting. Primary cable routing (new and existing). Pad-mounted transformers and service laterals. Cable television and telephone routing.

FACILITY DESIGN

Drawing Type / Scale	Show This Information
Floor Plan 1/8"=1'-0"	Use Floor Plan provided in package incorporating changes if necessary. Overall dimensions. Structural grid and columns. Mechanical room layout showing major equipment. Exterior equipment and screening.

FACILITY DESIGN

Drawing Type / Scale	Show This Information
Typical Exterior Elevations 1/8”=1’-0”	Show all sides. Identify all exterior materials.
Building Sections (2) 1/4”=1’-0”	Longitudinal and cross section
Details.	Special features.

(2) Specifications. Provide outline Specification, indicating the quality of materials, construction, finishes, fixtures, and equipment for the applicable items. Special attention should be given to the identification and specification of energy conservation features included in the proposal, particularly those that exceed the minimum requirements of the Statement of Work.

(3) Each Offeror will complete and submit the SPiRiT Facility Points Summary with the proposal; the total point score will determine the SPiRiT Sustainable Project Certification Level: SPiRiT Bronze, Silver, Gold, or Platinum. A minimum level of Gold is required. The level of incorporation of sustainable design principles shall be measured through use of the Sustainable Project Rating Tool (SPiRiT), available from the following website: http://www.cecer.army.mil/SustDesign SPiRiT is the government version of the LEED Green Building Rating System™, developed by the U.S. Green Building Council.

(4) Furniture/Fixture/Equipment Schedules. Schedules shall indicate proposed type of equipment, size or capacities, manufacturer, and model number. Furnish manufacturer's catalog data on equipment and fixtures for all features of the facilities, this shall include electrical equipment and lighting, mechanical heating and cooling equipment, domestic water system equipment, as well as catalog information on the architectural specialties such as the apparatus bay doors. Originals of manufacturer's catalog should be submitted in lieu of reproducibles to ensure legible data.

(5) Color Boards. Coordinated interior and exterior color schemes. For proposal evaluation provide one copy of the scheme complete with samples and/or chips of the colors, materials, textures, and finishes. The Government reserves the right to request and select different colors from the proposed manufacturer’s equivalent products following award with no change in contract amount.

(6) Evaluation Factors/Proposal Contents Listing. A spreadsheet or table consisting of all the evaluation categories and sub-categories listed in Section 00120 for technical proposal evaluation and specific reference to where in the proposal documents those requirements are addressed or indicated. Indicate in a separate category any specific extra items/betterments offered above the requirements of the RFP.

(7) Project Management Plans and Schedules. The Offeror shall provide a Draft/Outline Management Plan and it shall be developed specifically for this project. This is an overall plan showing how the Offeror will control the job. The term "management plan" is defined as a plan that includes the following sub plans: Quality Control Plan; Integrated Design and Construction Schedule and Contract Closeout Plan

(a) Sample Quality Control Plan. The Quality Control Plan is part of the Management Plan. The alliance of the project designer and builder on a project such as this naturally removes one commonly used method of quality control; that is, the usual reliance on the owner or the design consultant for monitoring construction quality. Although the Government will provide an on-site representative during construction, Offerors are expected to develop a formal program of monitoring to ensure a high level of construction quality. Offerors shall submit Quality Control Plans that respond to the minimum requirements of Technical Specifications Section 01451 (furnished with this RFP package) entitled "Contractor Quality Control Design/Build." The Offeror's program shall include the following characteristics:

CONTRACTOR QUALITY CONTROL REQUIREMENTS

A clear identification of the personnel responsible for quality control and a clear policy establishing their authority. The quality control group shall be separate and apart from (not the same) the people that are doing the construction. This quality control group shall report to the Contractor's management at a level no lower than a vice president of the company.
A specific description of the tasks and functions of the quality control personnel.
A specific policy establishing schedules for the performance of quality control tasks.
A policy for reporting quality control findings to the Contracting Officer.
A procedure whereby the Contracting Officer may resolve disputes that have not received satisfactory responses from the first levels of quality control personnel.
The names of testing laboratories to be used and the procedures for test data reporting.
A plan for material storage and protection.
The plan for review, evaluation, and Offeror Quality Control of the Design Submittals prior to Government receipt.
The plan for review of submittals and extensions of design. Of particular interest is the role of the Designer of Record in all design and construction progress.
Procedures for involving Key Subcontractors in the design development.
Procedures for successful integration of the Offeror's Quality Control Program with the Government's Quality Assurance Program.

(b) Integrated Design and Construction Schedule. A schedule shall be provided indicating the design (submittals, review periods) and construction (mobilization, site work, building construction, fixtures/equipment, close-out). The Offeror shall also submit a rationale explaining how the schedules will be achieved. The schedule for design and construction shall be task oriented, indicating dates by which milestones are to be achieved. The Offeror may use a critical path or other method of his/her choice; however, the schedules shall be graphically represented.

(c) A Closeout Plan shall be furnished in a brief structured time scale schedule reflecting the planned activities during the final 90 days of the contract activity. Items to be included are as follows:

CLOSEOUT PLAN

Testing of equipment and systems with schedules and reports.
Equipment instruction and training schedules.
O&M Manuals transfer.
As-built drawings transfer.
Transfer procedures and schedules.
Pre-final inspection procedures and correction of deficiencies.
Warranty data submission and planned implementation.
Cleanup of administrative deficiencies.
Move off site.

(8) Subcontracting Plan: All large businesses are required to submit a subcontracting plan with their Phase II proposal. For guidance in preparing an acceptable plan refer to the Army's Subcontracting Plan Evaluation Guide (Army Federal Acquisition Regulation Supplement Appendix CC) at http://acqnet.sarda.army.mil/afar/apcc.htm. For information in preparing the subcontracting plan the Norfolk District required subcontracting goals are as follows:

62% of planned subcontracting dollars placed with small business concerns
9% of planned subcontracting dollars placed with small disadvantaged business concerns
5% of planned subcontracting dollars placed with women owned small business concerns

2% of planned subcontracting dollars placed with HUBZONE concerns

3% of planned subcontracting dollars placed with small business Veteran Owned business concerns

Small disadvantaged, women owned small, HUBZONE, and small veteran owned business concerns may all be a part of the 62% small business percentage.

4.00 RESTRICTIONS

a. Incomplete proposals. Failure to submit all the data indicated may be cause for determining a proposal incomplete and, therefore, not considered for technical evaluation in Phase II, or for subsequent award.

END OF SECTION

SECTION 00120
PROPOSAL EVALUATION AND CONTRACT AWARD

1. PROPOSAL EVALUATION.

a. PHASE I Evaluation Factors:

FACTOR 1-1: OFFEROR PAST PERFORMANCE: This factor is the most important factor in the evaluation of Phase I proposals.

FACTOR 1-2: OFFEROR RELEVANT EXPERIENCE: This factor is slightly less important than Factor 1-1 but represents a significant level of importance in evaluating proposals.

FACTOR 1-3: OFFEROR PROJECT KEY PERSONNEL: This factor is equal in importance to Factor 1-2.

FACTOR 1-4: TECHNICAL APPROACH NARRATIVE: This factor is less important than Factor 1-3.

b. PHASE II Evaluation Factors:

FACTOR 2-1: FACILITY DESIGN AND EQUIPMENT: This Factor is the most important Factor in the Evaluation of Phase II proposals.

FACTOR 2-2: FACILITY ENGINEERING: Factor 2-2, 2-3, 2-4, and 2-5 are slightly less important than Factor 2-1, and are of approximately of equal importance.

FACTOR 2-3: SITE DESIGN AND SITE ENGINEERING: Factor 2-2, 2-3, 2-4, and 2-5 are slightly less important than Factor 2-1, and are of approximately of equal importance.

FACTOR 2-4: OFFEROR MANAGEMENT PLANS AND SCHEDULES: Factor 2-2, 2-3, 2-4, and 2-5 are slightly less important than Factor 2-1, and are of approximately of equal importance.

FACTOR 2-5: OFFEROR SUB-CONTRACTING PLAN: Factor 2-2, 2-3, 2-4, and 2-5 are slightly less important than Factor 2-1, and are of approximately of equal importance.

c. Overall Proposal Evaluation Consideration

At the completion of both Phase I and Phase II evaluations the ratings from each of the phases will be tabulated. The Phase II evaluation is slightly more important in final selection than the results of the Phase I evaluation. At the completion of the evaluation process each proposal that completed both phases of the evaluation process will be assigned a single adjectival rating.

2. EVALUATION PROCESS

The proposal and evaluation process for this project will take place in two Phases. Each phase will include unique requirements to the potential Offerors. The Offeror's responses to these requirements will be evaluated with respect to the evaluation criteria set forth in this Section.

a. PHASE I will concern itself with Offeror's Past Performance, Offeror's Relevant Experience, Proposed Project Key Personnel, and Technical Approach Narrative. All proposals received in

response to PHASE I will be evaluated and rated. At most, five (5) proposals will move forward into PHASE II which will define the technical requirements of the project and request the Offeror's technical solutions to the project parameters.

b. PHASE II: The Phase I proposals which are determined to present the most advantages to the Government will receive the Phase II amendment to the solicitation which will include the Statement of Work, design considerations, and site constraints from the Government. These Offerors will review, evaluate, and propose a creative solution to the design problem presented. Offerors will also include financial and cost information with this technical proposal. Only Offerors who reach PHASE II will be provided the opportunity to submit design solutions and cost information.

3. BASIS OF AWARD

a. The Government will award a firm fixed-price contract to that responsible Offeror whose complete (Phase I and II portions) proposal, which was evaluated to be at least conforming to the solicitation, determined to be fair and reasonable, and has been selected as the most advantageous to the Government, quality (comprised of technical approach and performance capability factors), price, and other factors considered. The rated evaluation criteria and price are considered approximately equal. As evaluation ratings and relative advantages and disadvantages become less distinct, differences in price between proposals are of increased importance in determining the most advantageous proposal. Conversely, as differences in price become less distinct, differences in ratings and relative advantages and disadvantages between proposals are of increased importance to the determination.

b. The Government reserves the right to accept other than the lowest priced offer. The right is also reserved to reject any and all offers. The basis of award will be a conforming offer, the price or cost of which may or may not be the lowest. If other than the lowest priced offer is accepted, that offer must be sufficiently more advantageous than the lowest priced offer in order to justify the payment of additional amounts.

c. Offerors are reminded to include their best technical and price terms in their initial offer and not to 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 a conforming proposal without discussions, if deemed to be within the best interests of the Government.

4. PHASE I EVALUATION PROCEDURES AND CRITERIA:

a. RATINGS: All proposal information received as a result of the Phase I solicitation shall be reviewed, evaluated, and rated with respect to the following rating scheme:

RATING	EXPLANATION
Unknown/Performance Risk	Past performance information provided does not provide sufficient depth and breadth of experience to allow a definitive rating.
Outstanding/Very Low Performance Risk exists	Based on the Offeror's performance record, no doubt that the Offeror will successfully perform the required effort.
Above Average/Low Performance Risk	Based on the Offeror's performance record, little doubt

	exists that the Offeror will successfully perform the required effort.
Satisfactory/Moderate Performance Risk	Based on the Offeror's performance record, some doubt exists that the Offeror will successfully perform the required effort. Normal contractor emphasis should preclude any problems.
Marginal/High Performance Risk	Based on the Offeror's performance record, substantial doubt exists that the Offeror will successfully perform the required effort.
Unsatisfactory/Very High Performance Risk	Based on the Offeror's performance record, extreme doubt exists that the Offeror will successfully perform the required effort.

b. FACTOR 1-1: OFFEROR PAST PERFORMANCE: Offeror Past Performance: The Government will evaluate the satisfaction of the customers in the example projects identified by the Offeror and from which Past Performance Evaluation Questionnaires have been received. The Government may contact the points of contact indicated to assure validity of the received questionnaires. The Government may contact sources other than those provided by the Offeror for information with respect to past performance. These other sources may include ACASS (Architect-Engineer Contract Administration Support System), CCASS (Construction Contractor Appraisal Support System), telephone interviews, and Government personnel with personal knowledge of the contractor's performance capability. Offerors will be provided with an opportunity to address any negative past performance information on which the Offeror has not previously had such an opportunity. The following areas of major consideration will be determined from evaluation of all sources of past performance information and an overall rating provided:

(1) Quality of the Product Produced. Based on the information provided in the questionnaire and other information the Government will access the quality of the actual projects produced and the standards of workmanship exhibited by the Offeror's team.

(2) Adherence to Project Schedule. The Government will evaluate all information available with respect to the Offerors completing past projects within the scheduled completion times.

(3) Management Processes. The Government will evaluate all information available with respect to the Offerors management of design and construction activities, subcontractors, and any other project management consideration.

c. FACTOR 1-2: OFFEROR RELEVANT EXPERIENCE: Relevant Experience. The Government will evaluate the example projects provided by the Offeror to evaluate and rate the recent experience of the Offeror in similar construction and design-build projects. The examples projects, which most closely resemble the project identified in this solicitation, will receive the highest consideration. If the Offeror cannot provide suitable relevant experience and the Government considers the provided information to indicate that the Offeror has no relevant experience, this Offeror shall receive a neutral rating.

d. FACTOR 1-3: OFFEROR PROJECT KEY PERSONNEL: Offeror Project Key Personnel. The Government will evaluate and rate the Key Personnel identified in the Phase I proposal requirements. The resumes and levels of responsibility of the principal managers and technical personnel who will be directly responsible for the day-to-day design and construction activities will be evaluated. Information

should include, as a minimum, the project manager; the project architect; the engineers responsible for civil, electrical, mechanical and structural design; the quality control manager; and the construction manager/superintendent. Data should indicate whether each individual has had a significant part in any of the project examples cited. If reassignment of personnel is considered possible, the names and resumes of the alternative professionals for each assignment will be evaluated. Individuals who have past experience with Corps of Engineers construction project operations and who have completed the Corps sponsored Quality Control Class are desirable. Additional consideration shall be given to teams that have worked successfully together on past projects.

e. FACTOR 1-4: TECHNICAL APPROACH NARRATIVE: Technical Approach Narrative. The Government will evaluate the overall understanding of the design-build process on this project. Particular attention will be paid to the inclusion of the major construction subcontractors during the design process as well as the definition of the roles and responsibilities of the various subcontractors. Offerors are cautioned that this narrative shall not exceed five (5) pages and that the Government will review and evaluate only the information contained on the first five pages in this section. Information beyond the five (5) page limit will be ignored.

f. Evaluation Methodology. The Government evaluation team will meet and determine a rating for each of the evaluation factors for Phase I by consensus decision. After each of the Factors for each of the proposals are rated, the team will develop, again by consensus, a final overall rating for the Phase I proposal. Up to five Offerors will continue into Phase II of the project. No proposals, which receive an overall rating of Unsatisfactory or Marginal, will be forwarded to Phase II regardless of the total number of proposals received.

5. PHASE II EVALUATION PROCEDURES AND CRITERIA:

a. General. The proposals from the Offerors who reach Phase II will be evaluated by a technical team of Government staff to determine compliance with this solicitation (as a minimum), and to evaluate the quality of the proposed materials, methods, and procedures. Each of the evaluation Factors for Phase II will be evaluated by the Government and a final overall rating for the proposals shall be determined by consensus of the Government evaluation team. The rating scheme for Phase II of the process is as shown below:

<u>EXCELLENT:</u> The Offeror greatly exceeds the scope of the solicitation requirements in all aspects of the particular factor or sub-factor. The Offeror also provides significant advantage(s) and exceeds the solicitation requirements in performance or capability in an advantageous way and has no apparent or significant weaknesses or omissions.

<u>ABOVE AVERAGE:</u> The Offeror exceeds the scope of the solicitation in most aspects of the particular factor or sub-factor. The Offeror provides an advantage in key areas or exceeds performance or capability requirements, but has some areas of improvement remaining.

<u>HIGH AVERAGE</u>: The Offeror matches the scope of the solicitation in all aspects of the particular factor or sub-factor. The Offeror does include an advantage in some but not all areas of performance or capability for this factor or sub-factor. There is room for improvement in this element.

<u>AVERAGE:</u> The Offeror matches the scope of the solicitation in most aspects of the particular factor or sub-factor. The Offeror meets the performance or capability requirements of the element but not in a way advantageous to the Government. There is room for improvement in this element.

LOW AVERAGE: The Offeror meets some but not the entire minimum scope of this factor or sub-factor. The Offeror does not include any advantages in any areas and does meet the minimum performance or capability requirement for the particular factor or sub-factor. The offer has many apparent weaknesses and improvements are necessary.

POOR: The Offeror does not meet the minimum scope of the solicitation for the particular factor or sub-factor. The Offeror does not include any advantages and does not meet the minimal performance or capability requirements for this element. The Offeror contains many apparent weaknesses and requires improvement.

UNACCEPTABLE: The Offeror fails to meet the scope of the solicitation in all aspects of the factor or sub-factor or has not submitted any information to address this evaluated item. The Offeror does not include any advantages in any areas of the element and does not meet the minimum performance or capability requirements of this factor or sub-factor. The proposal includes large apparent weaknesses and the proposal will require extensive modifications to come into compliance with the minimum requirements of the solicitation.

b. Relative Importance of Factors. Refer to paragraph 1 in this section for delineation of factor relative importance.

FACTOR 2-1: FACILITY DESIGN Facility design includes the function and appearance of facility materials, exclusive of the purely technical performance of internal engineering systems. The sub factors and elements considered herein deal with the planning and design of the facilities, as well as the durability and thermal performance of the materials. The design will be evaluated in terms of completeness, quality, performance and durability of products proposed. The sub-factors described below will be evaluated in the following order of importance:

Ranking of Sub-Factors
Subfactor 2-1a is considered the most important.

All other Sub factors are of approximately equal importance.

a. NET FLOOR AREA Proposals, which reflect the government design solution, will receive a rating of “Average”. Proposals, which deviate from the solicitation requirements and provide a lesser floor area than shown in the design solution presented with this solicitation will be rated “Unacceptable” or “Poor”. An increase in floor area providing additional functional space (while not exceeding the budget) may be considered a betterment and could receive a higher rating.

b. EXTERIOR FINISHES The design solution included in the solicitation presents a required level of quality and materials for the facility. For proposals, which reflect the design solution included in the solicitation a rating of “Average”, shall be provided for this sub-factor. For proposals, which include betterments or enhancements, the following items will be considered: reduction of maintenance, appearance, and life expectancy of proposed materials.

c. INTERIOR FINISHES The statement of work presents a minimum level of quality for the facility. For proposals, which reflect the design solution included in the solicitation a rating of “Average”, shall be provided for this sub-factor. For proposals, which include betterments or enhancements, the quality, durability, maintainability, and aesthetics for each of the following will be evaluated:

(1) Walls.

(2) Ceilings.
(2) Flooring.
(3) Window treatments.
(4) Acoustic treatments.

d. COLOR SCHEMES This sub-element considers the aesthetics and coordination of interior and exterior finish designs.

e. SUSTAINABLE DESIGN AND DEVELOPMENT (SD&D) RATING A minimum Gold level of achievement is required. No rating shall be scored “Poor”, “Low Average”, “High Average”, or “Above Average. A Gold shall be scored “Average”, and a Platinum rating shall be scored “Excellent”.

FACTOR 2-2: FACILITY ENGINEERING. In addition to system design, each subfactor evaluates the choice of materials for the systems in terms of life cycle cost effectiveness. Offerors are encouraged to adopt and/or develop additional means and methods to enhance the performance of the submitted design. Considerations such as durability, corrosion resistance, pest resistance, ease of maintenance, life cycle cost of maintenance, and energy efficiency should be included within the following sub-factors:

Ranking of Sub-Factors

All Subfactors are of approximately equal importance.

a. HEATING, VENTILATION, AND AIR CONDITIONING The statement of work provides for basic minimum requirements for the design and construction of the HVAC systems. For proposals, which include betterments or enhancements to those systems, the evaluators will consider the following: maintenance ease, energy efficiency, extended warranties, durability, and higher levels of sustainable design.

b. INTERIOR ELECTRICAL SYSTEM The statement of work provides for the basic requirements with respect to interior electrical systems. For proposals which include betterments or enhancements to those systems, the evaluators will consider the following: switching, panel design (e.g., panel size, number of circuits, provision of spares), location of data and telephone outlets, motion sensors for controlling lights, convenience outlet locations, energy efficient lighting, aesthetically appealing light fixtures, and higher levels of sustainable design.

c. INTERIOR PLUMBING SYSTEM. The statement of work provides the basic requirements with respect to the plumbing systems required for the facilities. For proposals, which include betterments or enhancements to those systems, the evaluators will consider the following: piping systems design quality, fixture quality, and water heater size and recovery, and higher levels of sustainable design.

d. STRUCTURAL SYSTEM This element considers the quality of the foundation and framing system design. The design solution provided in the solicitation presents a minimum level of quality for the facility. For proposals, which reflect the design solution included in the solicitation a rating of “Average”, shall be provided for this sub-factor. Structural designs that enhance the architectural design or spaces may receive a higher rating.

FACTOR 2-3: SITE DESIGN AND SITE ENGINEERING. Site design includes overall planning, layout, design and development of the sites (subfactors (a – b). It embraces consideration of compatibility of grounds and buildings, functionality, dignity, and environmental livability. Site engineering includes the technical performance of site design and exterior utility systems (subfactors c – g). The quality of the proposed construction materials is also evaluated in each element. Particular emphasis is placed on durability, corrosion resistance, pest resistance, ease of maintenance, and life cycle cost of maintenance requirements. Consideration will be given to the suitability of the chosen material to the environment in which it is to be placed. Evaluation of proposed betterments and enhancements includes consideration of engineering aspects of operation and maintenance. Utility systems are to be evaluated beyond the 5-ft line from the facilities.
Ranking of Sub-Factors:

Subfactor a, b, and c are all equal in importance.
Subfactor d, e, f, and g are all of equal importance and less important than subfactors a, b, and c.

a. FORCE PROTECTION CONSIDERATIONS: This subfactor evaluates the implementation and considerations of the facility construction related Force Protection Requirements associated with these facilities. Enhancement or betterments included with the proposals must not compromise the force protection requirements of this solicitation.

b. LANDSCAPE PLANTING PLAN This sub-factor evaluates the design, quality, quantity, and location of trees, shrubs, plantings, ground covers, and grass used to screen and enhance the facility. Considerations include screening, decorative planting, and the following:

(1) Screening and Shading
(a) Have plant material been specified that is hardy to the area?
(b) Consider number, size, type, and quality of trees and shrubs proposed.
(c) Are foundation plantings provided as appropriate to meet low maintenance requirements? Consider number, size, type, and quality.
(d) Does landscape generally comply with Antiterrorism Force Protection requirements?

c. SITE INTEGRATION. This sub-factor evaluates grading, drainage, its integration with natural features, and the proposals integration with the surrounding area. For proposals, which include enhancements or betterments, the following items will be considered:

(1) Integration with Surrounding Area. This element evaluates the integration of physical flows and relationships with, and between, the site and surrounding area.

(2) Preservation of Natural Features. This element evaluates the preservation of trees, natural drainage swales, and any other natural features that lend interest and appeal to the community.

(3) Grading This element evaluates the effects of grading on the natural features of the site and the topographic features and character of the surrounding areas and region.
(a) Consider the aesthetic effects of grading.
(b) Does the grading plan enhance and blend with the natural conditions on the site? Does it blend the proposed development into the general topographic character of areas surrounding the site and the region in general?

(4) Drainage Design. This element evaluates the quality and effectiveness of the drainage system design in handling surface runoff.

d. WATER SYSTEM. Evaluates system design, material quality, and maintainability for proposals, which include enhancements or betterments.

e. GAS PIPING SYSTEM. Evaluates piping sizes, material quality, layout, accessibility, and cutoff isolation for proposals, which include enhancements or betterments.

f. ELECTRICAL DISTRIBUTION Evaluates system design, material quality, and maintainability for proposals, which include enhancements or betterments.

g. SANITARY SEWER SYSTEM Evaluates system design, material quality, and maintainability for proposals, which include enhancements or betterments.

FACTOR 2-4: OFFEROR MANAGEMENT PLANS AND SCHEDULES.

This factor evaluates the Offeror's Project Management Plans as well as the proposed schedule for completion of the entire design-build project. Through this factor the Government will evaluate the Offeror's understanding of the solicitation provisions with respect to an integrated design-build process and the associated quality control, scheduling, coordination, and contract close out provisions. Each of the subfactors below is approximately equal in importance in the evaluation.

a. QUALITY CONTROL PLAN. The sample quality control plan provided by the Offeror will be reviewed and evaluated for inclusion of specific quality control practices and requirements necessary for the successful completion of all phases of this project. These phases include design stages as well as construction specialties. Offeror's plan should show the inclusion of the Corps Three Phase Inspection process and address the implications and operations of the Quality Control Plan and it's integration with the Quality Assurance Operations performed by the Government. The personnel and qualifications of the individuals performing in the Quality Control organization will be evaluated under the Phase I submission, however, if personnel changes have occurred since the Phase I submittal, these individuals must be evaluated as part of the Phase II evaluation process.

b. INTEGRATED DESIGN AND CONSTRUCTION SCHEDULE. The schedule will be evaluated to assess the rational of how the Offeror intends to comply with the submitted schedule. The schedule must reflect a single task oriented structure for both design and construction. The schedule will be reviewed for completeness and the inclusion of required milestones. A schedule, which improves on the Government supplied maximum duration, will be considered more favorably during the evaluation.

c. CLOSEOUT PLAN. The Offeror's closeout plan will be reviewed and evaluated to determine the Offeror's understanding the close out requirements of the solicitation. Particular emphasis will be placed on O&M Manual production and Installation Staff training methods and processes.

FACTOR 2-5: OFFEROR SUB-CONTRACTING PLAN.

The Government will evaluate the Offeror's proposed subcontracting plan in terms of achieving the required special emphasis group participations and the completeness and rational for the plan proposed. Offerors who are not required to submit a subcontracting plan (i.e. Small Business concerns) will be assigned a rating equal to the highest evaluation of any subcontracting plan submitted in response to this solicitation.

End of Section

SECTION 01005

PROJECT WORK REQUIREMENTS AND RESTRICTIONS
06/01

1 GENERAL

1.1 DEFINITIONS

a. Facility: The facility is a Fire & Emergency Services Center (FESC) Phase 1, Fort Lee.

b. CO: Contracting Officer or his authorized representative.

1.2 SUBMITTALS (NOT APPLICABLE)

1.3 COOPERATION WITH USING AGENCY AND OTHER CONTRACTORS

During the period of this contract, other contracts may be in force for the construction of other features of work on or adjacent to the site of work being accomplished under this contract. It shall be the responsibility of the Contractor on this contract to be fully informed of the extent of the limits of work to be performed by other Contractors. Should there be any conflict between these limits, it shall be brought to the attention of the Contracting Officer and the CO's decision shall be final. Also, prior to completion of work under this contract, members of the Using Agency may be performing work or occupying facilities on or adjacent to the area. The Contractor shall arrange his plant and shall schedule and perform this work to effectively cooperate with all other Contractors and Government agencies.

1.4 PERSONNEL RESTRICTIONS

Personnel are limited to the immediate site area and shall not enter other buildings or facilities not involved in the work. All employees of the Contractor will be subject to all rules and regulations of the Post, which pertain to personnel. The Contractor shall erect fences and signs as specified and be responsible for the restrictions of all personnel. The Contractor's plans for restricting personnel access to the project site shall be submitted for approval as a part of the Safety Plan (Accident Prevention Plan).

Post access shall be restricted. Contractor shall comply with current security requirements. Expect to register all vehicles with the military police.

1.5 TRANSPORTATION FACILITIES

An all weather surfaced road network serves the Post. Road(s) within the Post 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, subject to approval, such temporary haul roads and bridges as may be necessary for conducting his work. Any such temporary construction shall be removed and the affected area 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.

1.5.1 Use of Roads

The Contractor shall keep all roads clear of all obstructions and free of mud and other foreign materials resulting from operations. The Contractor's vehicles shall at no time follow a vehicle closer than 50 feet, and all vehicles shall immediately pull off the road or to the side and come to a complete stop

when meeting emergency vehicles and vehicles with flashing lights. Post speed limits and traffic controls will be observed.

1.5.2 Road Restrictions

The movement of all vehicles within the Post shall be confined to the roads designated and shall comply with traffic regulations within the Post. Other roads may be used only with the approval of the CO.

1.5.2.1 Loading Limitations

Load limit for all roads within the boundaries of the Post, shall comply with the Post's requirements. The Contractor shall not exceed these limits except by prior written approval of the Contracting Officer.

1.5.2.2 Cleated Vehicles

Cleated vehicles shall not be moved over surfaced roads.

1.6 COORDINATION IN WORK AREAS

1.6.1 Unoccupied Work Area

The area where the Contractor is scheduled to perform the work will not be occupied during the work; however, the Contractors work activities may affect other area(s) that are occupied. All work shall be in accordance with the Contractor's approved work plan.

1.6.2 Maintenance of Utilities

Any active utilities, including but not limited to electricity, gas, water, sewer, heating, air conditioning, or any like service, that will require interruption or replacement in any occupied area affected as a result of the Contractors scheduled work activities, shall be temporarily provided by the Contractor at his own expense until the affected service is fully and permanently restored. All temporary method(s) of service replacement the Contractor proposes for use on this contract shall be approved by the Contracting Officer prior to commencing the work.

1.6.3 Hours of Work

The normal work hours for construction shall be from 7:30 a.m. to 4:00 p.m., Monday through Friday of each week. Any request to change these hours shall be made in writing to the Contracting Officer at least two calendar days prior to the desired day on which the change is to go into effect. The changed hours shall not go into effect until written permission has been received from the Contracting Officer.

1.6.4 Digging Permits

Digging Permits. It shall be the responsibility of the contractor to contact Miss Utilities for locating commercial utilities and ensuring that utilities are marked on the site prior to starting any excavation work. The contractor shall be responsible for all costs associated with this work.

1.7 INTERRUPTIONS OF UTILITIES

1.7.1 Approval

Utility services shall not be interrupted by the Contractor to relocate, make connections, or interrupt for any purpose, without written approval of the Contracting Officer.

1.7.2 Request

Request for permission to shut down services shall be submitted in writing to the Contracting Officer not less than 15 calendar days prior to date of proposed interruption or as required by DPW, except for electrical services. Request for electrical service outage/energize shall require a 15-calendar day notice or as required by DPW. Virginia American Water Works shall operate valves for water mains. The request shall give the following information, but not limited to:

a. Nature of Utility (Gas, L.P. or H.P., Water, Elec.)

b. Size of line and location of shutoff.

c. Buildings and services affected.

d. Hours and date of shutoff.

e. Estimated length of time service will be interrupted.

1.7.3 Service Interruptions

15 days advance notice must be given to DEL for interruption of services. Services shall not be shut off until receipt of approval of the proposed hours and date from the Contracting Officer.

1.7.4 Timely Disconnections

Shutoffs which will cause interruption of Government work operations as determined by the Contracting Officer shall be accomplished during regular non-work hours or non-work days of the Using Agency without any additional cost to the Government.

1.7.5 Utilities Operation

Operation of valves on water mains will be by water utility personnel, Virginia American Water Works. Where shutoff of water lines interrupts service to fire hydrants or fire sprinkler systems, the Post Fire Department shall be notified by the Contractor in writing 72 hours prior to the proposed interruption or as required by Department of Engineering Logistics (DEL). The Contractor shall arrange his operations and have sufficient material and personnel available to complete the work without undue delay and shall restore service without delay in event of emergency.

1.7.6 Gas

Flow in gas mains, which have been shut off, shall not be restored until the Contractor has coordinated with the Government and has determined that all items serviced by the gas line have been shut off.

1.8 PHYSICAL DATA

The physical conditions indicated in the RFP are the result of site survey.

1.9 TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER

This provision specifies the procedure for the determination of time extensions for unusually 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:

a. 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.

b. 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.

1.9.1 Schedule

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

Fort Lee	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	6	6	6	8	6	6	7	5	3	5	5	5

1.9.2 Records

Upon acknowledgement of the Notice to Proceed 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.

1.9.3 Impacted Days

The number of actual adverse weather 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 in each month, and be recorded as full days. If the number of actual adverse weather delay days exceeds the number of days anticipated in the schedule of monthly anticipated adverse weather delays, above, the contracting officer 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 Clauses entitled "Default (Fixed Price Construction)".

1.10 IDENTIFICATION OF GOVERNMENT-FURNISHED PROPERTY

There shall be no government furnished property.

1.11 SITE CONTAMINATION

This site is designated a Category II site and is defined as a current or former industrial site or other hazard producing activity site which is perceived to be a clean location; however, due to former industrial or other activities within or near the site, it has the potential for contamination.

1.11.1 Compliance Requirements

The Contractor shall comply with applicable Federal, state and local laws, codes, ordinances and regulations (including the obtaining of licenses and permits) in connection with any hazardous material, substance or waste.

1.11.2 Requirements

The requirements of this clause and any act or failure to act by the Government shall not relieve the Contractor of any responsibility or liability for the safety of Government, Contractor or subcontractor personnel or property.

1.11.3 Contamination

In the event that contamination beyond that shown or specified is encountered, the Contracting Officer shall be advised immediately. The contamination shall be removed as directed and replaced with satisfactory material. Payment therefor will be made in conformance with the CHANGES clause of the CONTRACT CLAUSES.

1.12 SCHEDULING AND DETERMINATION OF PROGRESS

See Specification Section 01320 for scheduling requirements.

1.13 HISTORICAL AND ARCHAEOLOGICAL FINDS

Federal legislation provides for the protection, preservation, and collection of scientific, prehistorical, historical, and archaeological data, including relics and specimens which might otherwise be lost due to alteration of the terrain or building features as a result of any Federal construction project. Should the Contractor, or any of the Contractor's employees, or parties operating or associated with the Contractor, in the performance of this contract discover evidence of possible scientific, prehistorical, historical, or archaeological data, the Contractor shall immediately cease work at that location and notify the Contracting Officer, giving the location and nature of the findings. The Contractor shall forward written confirmation to the Contracting Officer as directed. The Contractor shall exercise care so as not to disturb or damage artifacts or fossils uncovered during excavation operations, and shall provide such cooperation and assistance as may be necessary to preserve the findings for removal or other disposition. Any person who, without permission, injures, destroys, excavates, appropriates, or removes any historical or prehistorical artifact, object of antiquity, or archaeological resource on the public lands of the United States is subject to arrest and penalty of law. Where appropriate by reason of discovery, the Contracting Officer may order delays in the time of performance or changes in the work, or both. If such delays or changes are ordered, an equitable adjustment will be made in the contract in accordance with the applicable clauses of the contract.

1.14 EQUIPMENT-IN-PLACE LIST:

The Contractor shall maintain a list of equipment installed under the terms of the contract. In the event that the contract includes more than one building or facility, a list must be maintained for each and delivered to the Contracting Officer upon acceptance of each building or facility. Forms to be used for this purpose shall be obtained from the Area Engineer's Office. The list shall include the following but not limited to:

a. Contract number
b. Description of item
c. Model number
d. Serial number
e. Capacity
f. Name of manufacturer
g. Address of manufacturer
h. Condition of item
i. Replacement cost
j. Name of person who checked item

1.15 EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE

1.15.1 Allowable Costs

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 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 II. 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 retrospective pricing, the schedule in effect at the time the work was performed shall apply.

1.15.2 Rental Costs

Equipment rental costs are allowable, subject to the applicable provisions of the Federal Acquisition Regulations, and shall be 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 form 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.

1.15.3 Equipment Costs

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 the Standard Form 1411, "Contract Pricing Proposal Cover Sheet". By submitting cost or pricing data, the Contractor grants to the Contracting Officer 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 SUBCONTRACTS AND WORK COORDINATION

Contract Clauses "SUBCONTRACTS", "PERMITS AND RESPONSIBILITIES", and "MATERIAL AND WORKMANSHIP" are supplemented as follows:

a. Divisions or sections of specifications are not intended to control the Contractor in dividing the work among subcontractors, or to limit work performed by any trade.

b. Contractor shall be responsible for the coordination of all work to be executed of the trades, subcontractors, and materials.

c. The Government or its representative will not undertake to settle any difference between the Contractor and Contractor's subcontractors, or between subcontractors.

d. The Government reserves the right to refuse to permit employment on the work or require dismissal from the work of any subcontractor who, by reason of previous unsatisfactory work on Corps of Engineers projects, or for any other reason is considered by the Contracting Officer to be incompetent or otherwise objectionable.

1.17 PROFIT

1.17.1 Weighted Guidelines

Weighted guidelines method of determining profit shall be used on any equitable adjustment change order or modification issued under this contract. The profit factors shall be as follows:

Factor Rate Weight Value	
Degree of Risk	20
Relative difficulty of work	15
Size of Job	15
Period of performance	15
Contractor's investment	05
Assistance by Government	05
Subcontracting	25
	100

1.17.2 Value

Based on the circumstances of each procurement action, each of the above factors shall be weighted from .03 to .12 as indicated below. The value shall be obtained by multiplying the rate by the weight. The value column when totaled indicates the fair and reasonable profit percentage under the circumstances of the particular procurement.

1.17.2.1 Degree of Risk

Where the work involves no risk or the degree of risk is very small, the weighting should be .03; as the degree of risk increases, the weighting should be increased up to a maximum of .12. Lump sum items will have, generally, a higher weighted value than the unit price items for which quantities are provided. Other things to consider: the portion of the work to be done by subcontractors, nature of work, where work is to be performed, reasonableness of negotiated costs, amount of labor included in costs, and whether the negotiation is before or after performance of work.

1.17.2.2 Relative Difficulty of Work

It the work is most difficult and complex, the weighting should be .12 and should be proportionately reduced to .03 on the simplest of jobs. This factor is tied in to some extent with the degree of risk. Some things to consider: the nature of the work, by whom it is to be done, where, and what is the time schedule.

1.17.2.3 Size of Job

All work not in excess of $100,000 shall be weighted at .12. Work estimated between $100,000 and $5,000,000 shall be proportionately weighted from .12 to .05.

1.17.2.4 Periods of Performance

Jobs in excess of 24 months are to be weighted at .12. Jobs of lesser duration are to be proportionately weighted to a minimum of .03 for jobs not to exceed 30 days. No weight where additional time not required.

1.17.2.5 Contractor's Investment

To be weighted from .03 to .12 on the basis of below average, average, and above average. Things to consider: amount of subcontracting, mobilization payment item, Government furnished property, equipment and facilities, and expediting assistance.

1.17.2.6 Assistance by Government

To be weighted from .12 to .03 on the basis of average to above average. Things to consider: use of Government owned property, equipment and facilities, and expediting assistance.

1.17.2.7 Subcontracting

To be weighted inversely proportional to the amount of subcontracting. Where 80 percent or more of the work is to be subcontracted, the weighting is to be .03 and such weighting proportionately increased to .12 where all the work is performed by the Contractor's own forces.

1.18 REAL PROPERTY ITEMS

The designer shall coordinate with the Fort Lee Real Property Officer and prepare a list of real property items constructed under the subject contract. The list shall include the following: category code, real property item description, number of units, units of measure, and total quantity. Near the end of construction, the Contractor shall use the list to assign the construction cost for the items and submit to the Government.

1.19 CONTRACTOR VEHICLE REGISTRATION

a. Contractors are required to register their vehicles upon entry at Fort Lee or at the Provost Marshall Office (PMO) Bldg. 8526, Fort Lee, Virginia in accordance with procedures outlined herein.

b. Contractors that currently have a contract less than 180 calendar days: Contractor employees must obtain a temporary visitor's pass in order to access Fort Lee. In order to obtain a temporary visitors pass for more than 1 day; the contractors must complete the Fort Lee Contractor Vehicle Registration Form, DOC Form 01-0001, and submit it upon entry into one of the open gates at Fort Lee. (See post gate operating hours under paragraph e.) The contractor employee must also present a valid Virginia driver's license, proof of insurance, vehicle registration and a contractor identification badge, if applicable. The contractor will only obtain a temporary visitor's pass not to exceed the duration of the contract or 180 calendar days, whichever is less.

c. Contractors that currently have a contract for more than 180 calendar days: Contractor employees must obtain a contractor decal in order to access Fort Lee. In order to obtain a vehicle decal, the contractors must complete the Fort Lee Contractor Vehicle Registration Form, DOC Form 01-0001, and submit it to the PMO. The contractor employee must also present a valid Virginia driver's license, proof of insurance, vehicle registration and a contractor identification badge, if applicable. Only contractor employees that have a valid contract exceeding 180 calendar days or longer will obtain a vehicle decal. Upon completion of the contract or termination of employment, the contractor shall ensure that all vehicle decals are scrapped off the employee's vehicles and turned back into the Directorate of Contracting, Bldg. 7124 or PMO. The scrapped sticker should be placed on a white sheet of paper with the contractor employee and company name placed on the paper. If the employee sells a vehicle, they must immediately turn in the scrapped sticker in order to

obtain a new sticker. Failure to follow the above procedures may result in delays in accessing Fort Lee and be reflective in the contractors past performance record.

d. All contractor employees must adhere to all rules, standards and regulations imposed by the Provost Marshall, Fort Lee, Virginia. All vehicles are subject to search and seizure. No firearms, explosives, or hazardous materials are allowed in Fort Lee, Virginia.

e. Effective 1 September 2001, the gate operating hours (which is always subject to change) for Fort Lee, Virginia will be as follows:

6th Street Gate	-	24 hours a day, seven days a week
Mahone Ave Gate	-	24 hours a day, seven days a week
Jackson Circle Gate		24 hours a day, seven days a week
Lee Ave Gate	-	5-9 a.m., Monday through Friday only
A. Ave Gate		5-9 a.m. and 2-6 p.m., Monday through Friday only

PART 2 PRODUCTS (THIS PART NOT USED)

PART 3 EXECUTION (THIS PART NOT USED)

SECTION 01012
DESIGN AFTER AWARD

1.0 GENERAL

The Contractor shall propose a schedule for the number and composition of the design submittal phases. As a minimum, design submittals are required at the preliminary (50%) and final (100%) design stages and at the design complete stage. The requirements of each design stage are listed hereinafter. The Contractor shall reflect the number and schedules for the design submittals phases in the progress charts.

2.0 DESIGNER OF RECORD

The Contractor shall identify, for approval, 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, registered Designer of Record. The Designer(s) of Record shall stamp, sign, and date all design drawings under their responsible discipline at each design submittal stage.

3.0 STAGES OF DESIGN SUBMITTALS

3.1 First Design Submittal (50%). This submittal is intended to insure that the contractor's design is proceeding in accordance with the terms of the solicitation and the contractor's original proposal as well as in a timely manner. This submittal shall consist of the following:

3.1.1 Design analysis, developed to 50%

3.1.2 50% complete drawings

3.1.3 Draft specifications

3.1.4 Environmental permits, as required. When environmental permits are not required, the Contractor shall provide a statement with justification to that effect.

3.2 Final Design Submittal (100%). The review of this submittal is to insure that the design is in accordance with directions provided the Contractor during the design process as well as the original solicitation and the contractor's proposal. The Contractor shall submit the following documents for Final Design Review:

3.2.1. 50% review comments and responses

3.2.2 The Design Analysis submitted for Final Design Review 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.

3.2.3 The Contract Drawings submitted for Final Design Review 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 the 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.

3.2.4 The Draft Specifications on all items of work submitted for Final Design Review shall consist of completely edited specification sections.

3.3 Design Complete Submittal. After the Final Design Review, the Contractor shall revise the Contract Documents by incorporating any comments generated during the Final Design. The Contractor shall submit the following documents for the design complete submittal:

3.3.1 Design analysis, in final complete form

3.3.2 Complete drawings

3.3.3 Final specifications

3.3.4 Annotated 100% review comments

3.3.5 CADD files of all drawings (2 copies)

3.3.6 Electronic files for design analysis, specifications, comments and data

4.0 FAST TRACK CONSTRUCTION START

Not used in this contract.

5.0 QUANTITY OF DESIGN SUBMITTALS

5.1 General. The documents, which the Contractor shall submit to the Government for each submittal, are listed and generally described hereinafter. Include a copy of the design analysis and specifications for each set of drawings.

DISTRIBUTION

Activity and Address	Drawings Size AO [Full]	Drawing Size A2 [Half]	Color Boards **
Commander, U.S. Army Engineer District, Norfolk, Attn: Lisa Bobotas	2	5	2
Commander, Ft. Lee Dept. of Engineering Logistics, Attn: John Royster	1	4	1
U.S. Army Corps of Engineers, Construction Area Office, Attn: Area Engineer Daryl Merryman	1	2	0

6.0 MAILING OF DESIGN SUBMITTALS

6.1 Mail all design submittals to the Government during design and construction, using an overnight or hand delivery service. The Government will furnish the Contractor addresses where each copy shall be mailed to after award of the contract. The submittals shall be mailed or delivered to four (4) different addresses.

6.2 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.

7.0 COORDINATION

7.1 Written Records. The Contractor shall 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.

7.2 Design Needs List. Throughout the life of his contract the Contractor shall furnish the COR a monthly "needs" 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.

8.0 GOVERNMENT REVIEW

8.1 Within 14 days after Notice to Proceed, the Contractor shall submit, for approval, an updated design schedule with all submittals and review times indicated in calendar dates. The Contractor shall update this schedule monthly. Design schedule indicates minimum design submission requirements and does not preclude other submittals (i.e., utility, foundation, framing, etc.) in efforts to expedite construction.

COMPLETION SCHEDULE

Item of Work	Calendar Days from Notice to Proceed
Submit 50% completed building design including design analysis, drawings and specifications and 100% utility design.	60
Submit 100% complete design including revised design analysis, drawings and specifications.	120
Complete all design work. Delay in completion of design will not be considered as a valid reason to delay completion of entire project.	180

8.2 After receipt, the Government will be allowed fourteen (14) days to review and comment on each design submittal. For each design review submittal, the COR will furnish, to the Contractor, a single consolidated listing of all comments from the various design sections and from other concerned agencies involved in the review process. The review will be for conformance with the technical requirements of the solicitation and the Successful Offeror's (Contractor's) RFP proposal. 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 the 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 any comment exceeds the requirements of this contract, that he should take no action and notify the COR in writing immediately. Review conferences will be held for each design submittal at Fort Lee. The Contractor shall bring the personnel that developed the design submittal to the review conference. These conferences will take place the week after the receipt of the comments by the Contractor.

8.3 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. Submittals date revisions must be made in writing at least one (1) week prior to the effected submittal.

8.4 Post review conference action: Copies of comments, annotated with comment action agreed on, will be made available to all parties before the conference adjourns. Unresolved problems will be resolved by immediate follow-on action at the end of conferences. Valid comments will be incorporated. After receipt of final corrected design documents upon incorporation of backcheck comments the District will recommend issuance of a Construction Notice to Proceed (NTP). The Government, however, reserves the right to disapprove design document submittals if comments are significant. If final or backcheck submittal(s) are incomplete or deficient, and require correction by the Contractor and resubmittal for review, the cost of rehandling and reviewing will be deducted from payment due the Contractor at the rate of $1,500.00 per submittal.

9.0 DESIGN ANALYSIS

9.1 Media and Format. Present the design analysis on 8-1/2-inch by 11-inch paper except that larger sheets may be used when required for graphs or other special calculation forms. All sheets shall be in reproducible form. The material may be typewritten, hand lettered, 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.

9.2 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.

9.3 Design Calculations. Design calculations 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 the source of loading conditions, supplementary sketches, graphs, formulae, and references. Explain all assumptions and conclusions. Calculation sheets shall carry the names of the author and the checker and the dates of calculations and checking. No portion of the calculations shall be computed and checked by the same person.

9.4 Automatic Data Processing Systems (ADPS). When ADPS are used to perform design calculations, the design analysis shall include descriptions of the computer programs used and copies

of the ADPS input data and output summaries. When the computer output is large, it may be divided into volumes at logical division points. Precede each set of computer printouts by an index and by a description of the computation performed. If several sets of computations are submitted, they shall be accompanied by a general table of contents in addition to the individual indices. Preparation of the description, which must accompany each set of ADPS printouts, shall include the following:

1. Explain the design method, including assumptions, theories, and formulae.
2. Include applicable diagrams, adequately identified.
3. State exactly the computation performed by the computer.
4. Provide all necessary explanations of the computer printout format, symbols, and abbreviations.
5. Use adequate and consistent notation.
6. Provide sufficient information to permit manual checks of the results.

9.5 The following sections shall be included in the Design Analysis-

Section I	Introduction and General Specification Criteria
Section II	Site Development
Section III	Geotechnical
Section IV	Architectural
Section V	Structural
Section VI	Electrical
Section VII	HVAC
Section VIII	Plumbing
Section IX	Fire Protection and Life Safety
Section X	Landscape
Section XI	Anti-terrorism Force Protection
Section XII	SPiRiT Evaluation

10.0 DRAWINGS

10.1 Prepare all drawings on Computer-Aided Design and Drafting (CADD) so that they are well-arranged and placed for ready reference and so that they present complete information. The Contractor shall prepare the drawings with the expectation that the Corps of Engineers, in the role of supervision, will be able to construct the facility without any additional assistance from the Contractor. 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 documents shall consist of drawings on a 36" x 24" 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 COR will furnish the Contractor file, drawing and specification numbers for inclusion in the title blocks of the drawings.

10.2 Create all drawings using CADD methods in AutoCAD format. Save all Design Complete CADD files as AutoCAD R14. The Contractor shall use EM 1110-1-1807 Standards Manual for U.S. Army Corps of Engineers Computer-Aided Design and Drafting (CADD) Systems as guidance to for standard details, cell libraries, title blocks, and layer/level assignments. Drawing features not addressed in EM 1110-1-1807 shall conform to drafting standards.

10.3 Only standard fonts provided by AutoCAD are allowed to be used in the creation of CADD files. No fonts created by third parties or the designer is permitted.

10.4 Submit all Design Complete CADD files on the following media.

- Read/Write CD-ROM Disk

11.0 SPECIFICATIONS

11.1 The Contractor shall submit marked-up and final specifications as required. The specifications may be any one of the major, well known master guide specification sources such as MASTERSPEC from the American Institute of Architects, SPECTEXT from Construction Specification Institute or Corps of Engineers Guide Specifications, etc. Use only one source for the project. Edit the specifications for this project and submit in marked-up or redlined draft version at the Final Review submittal stage. 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 final, design complete specification package. Delete all marked-out or redlined text and type in all inserted text.

11.2 Submittal Register. Develop the submittal requirements for construction during the design phase of the contract, by producing a Contractor Submittal Register. Attach a submittal register to each section of the specifications for the submittal requirements of that section. Prepare the Submittal Register in the Resident Management System (RMS). 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 drawings, manufacturer's literature, certificates of compliance, material samples, guarantees, test results, etc that the Contractor shall submit pursuant to the specifications during the life of the construction contract. The Contractor shall place all the Submittal Register pages in an appendix of the final specifications.

11.3 The following sections as a minimum where applicable shall be included in the design specifications-

<u>DIVISION 2 - SITEWORK</u>
02220 Demolition
02300 Earthwork
02315 Excavation, Filling and Backfilling for Buildings
02316 Excavation, Trenching and Backfilling Utilities Systems
02364 Termiticide Treatment Measures for Subterranean Termite Control
02510 Water Distribution System
02531 Sanitary Sewers
02532 Force Mains and Inverted Siphons; Sewer
02620 Subdrainage System
02630 Storm-Drainage System
02714 Drainage Layer
02722 Aggregate and/or Graded Crushed Aggregate Base Course
02741 Bituminous Paving for Roads, Streets, and Open Storage Areas
02763 Pavement Markings
02770 Concrete Sidewalks and Curbs and Gutters
02821 Fencing
02840 Vehicle Barriers
02921 Seeding
02922 Sodding
02930 Exterior Planting

<u>DIVISION 3 - CONCRETE</u>
03100 Structural Concrete Formwork
03150 Expansion Joints, Contraction Joints, and Waterstops
03200 Concrete Reinforcement
03300 Cast-In-Place Structural Concrete
03350 Architectural Precast Concrete

DIVISION 4 - MASONRY

04200	Masonry
04220	Nonbearing Masonry Veneer/Steel Stud Walls

DIVISION 5 - METALS

05090	Welding, Structural
05091	Ultrasonic Inspection of Weldments
05120	Structural Steel
05210	Steel Joists
05300	Steel Decking
05400	Cold-Formed Steel Framing
05500	Miscellaneous Metal

DIVISION 6 - CARPENTRY

06100	Rough Carpentry
06200	Finish Carpentry
06650	Solid Polymer Fabrications

DIVISION 7 – MOISTURE PROTECTION

07210	Building Insulation
07413	Metal Roofing and Wall Panels
07600	Sheet Metalwork, General
07840	Firestopping
07920	Caulking and Sealants

DIVISION 8 – DOORS AND WINDOWS

08110	Steel Doors and Frames
08120	Aluminum Doors and Frames
08210	Wood Doors
08342	Hydrolic 4 Fold Door
08520	Aluminum Windows
08700	Builders' Hardware
08810	Glass and Glazing

DIVISION 9 - FINISHES

09250	Gypsum Wallboard and Metal Framing
09310	Ceramic Tile and Porcelain Tile
09510	Acoustic Ceilings
09650	Resilient Flooring
09680	Carpet
09721	Vinyl Wall Covering
09900	Painting, General

DIVISION 10 - SPECIALTIES

10100	Visual Communication Specialties
10201	Louvers and Vents
10153	Toilet Partitions
10430	Exterior Signage
10440	Interior Signage
10500	Lockers
10605	Wire Mesh Partitions
10523	Fire Extinguishers, Cabinets and Accessories
10800	Toilet Accessories

DIVISION 11 - EQUIPMENT
11400 Food Service Equipment

DIVISION 12 - FURNISHINGS
12540 Window Blinds
12320 Casework and Countertops

DIVISION 13 – SPECIAL CONSTRUCTION
13080 Seismic Protection for Miscellaneous Equipment
13100 Lightning Protection System
13110 Cathodic Protection System (Sacrificial Anode)
13958 Forced Entry Resistant Components

DIVISION 15 - MECHANICAL
15080 Thermal Insulation for Mechanical Systems
15400 Plumbing, General
15569 Water & Steam Heating; Oil, Gas or Both
15620 Liquid Chillers
15895 Air Supply, Distribution, Ventilation, and Exhaust System
15951 Direct Digital Control For HVAC
15990 Testing, Adjusting, and Balancing of HVAC Systems
15995 Commissioning of HVAC Systems

DIVISION 16 - ELECTRICAL
16375 Electrical Distribution System, Underground
16415 Electrical Work, Interior
16528 Exterior Lighting Including Security and CCTV Applications

12.0 CONTENTS OF DESIGN SUBMITTALS

12.1 The 50% design submittals shall contain as a minimum, the following:

12.1.1 Drawings: All drawings required in the 100% submittal shall be developed to approximately 50 percent completion. Drawings shall indicate the design or test number upon which the fire and sound rated separations are based.

12.1.2 Specifications: Draft of specifications including index and trade sections. Include narrative description of products and installation for each section.

12.1.3 Design Analysis: Design analysis shall include design calculations developed to the extent required to support the design of that portion of acoustic, structural (including seismic), plumbing, fire protection, electrical and mechanical systems included in this submittal.
The 100% site/utility design submittal shall contain as a minimum, the following:

12.1.4 Geotechnical: Complete soils analysis and geotechnical report.

12.2 The 100% site/utility design submittal shall contain as a minimum the following:
12.2.1 All drawings included in the required technical data for the proposal submission (see SECTION 00110: PROPOSAL SUBMISSION REQUIREMENTS AND INSTRUCTIONS), shall be developed to 100 percent completion. In addition to the individual utility plans, submit a combined utility plan drawn to the same scale as the individual utility plans.

12.2.2 General Site Layout: Scale shall be as indicated in SECTION 00110: PROPOSAL SUBMISSION REQUIREMENTS AND INSTRUCTIONS.

12.2.3 Site Grading and Drainage Plans: Show locations of all sediment basins, diversion ditches, and other erosion control structures. Indicate the approximate drainage areas each will service. Indicate the materials, construction and capacity of each structure. General site grading and drainage shall be indicated by contour lines with an interval of not more than approximately 1 foot.

12.2.4 Sanitary Sewer Plan: Scale shall be as indicated in SECTION 00110: PROPOSAL SUBMISSION REQUIREMENTS AND INSTRUCTIONS and profiles showing location and elevation of pipe, thrust blocks, manholes, etc. Materials and construction of main and appurtenances shall be indicated. Specifications shall be provided.

12.2.5 Water Supply Line Plans: Scale shall be as indicated in SECTION 00110: PROPOSAL SUBMISSION REQUIREMENTS AND INSTRUCTIONS and profiles showing locations of valves, thrust blocks, connections, etc. Materials shall be indicated and specifications shall be provided for valves, pipes, etc.

12.2.6 Electrical Plan Requirements: Required diagrams and details on Site Electrical Drawings.

a. Off-Site Electrical Distribution Plan:
b. Off-Site Primary Circuit Routing Plans:
c. Off-Site One Line Diagram. (If applicable)
d. Off-Site Details. (Aerial Pole Line Construction, etc.) (If applicable).
e. Off-Site Communications and Cable Television
f. On-Site Electrical Distribution Plan:
g. On-Site One Line Diagram.
h. On-Site Distribution Transformer Schedule: Provide with the following headings:
   Transformer Designation. Transformer Size (KVA). Building(s) Served.
   Primary Phase(s) and Circuit to which connected.
i. On-Site Details (Site Lighting, Trenching, Pad-Mounted Transformer, etc.).
j. On-Site Communications and Cable Television.

12.2.7 Specifications: Provide final draft specifications, which include all sections, which apply to site/utility work.

12.2.8 Design Analysis: Design analysis shall include design calculations fully developed to support the design of the site and utility systems included in this submittal.

12.3 THE 100% BUILDING DESIGN SUBMITTALS shall contain, as a minimum, the following items for all submittals:

12.3.1 All drawings shall be developed to 100 percent completion. Furnish mechanical and electrical plans, with complete schematics, to show all air conditioning, plumbing and electrical work.

12.3.2 Show the construction of fire and sound rated assemblies in detail and note on the drawings the tested design upon which the construction is based. Note any modification to materials or method of construction. Detail all penetrations of rated partitions.

12.3.3 All details shall be referenced to floor plans, elevations or sections.

12.3.4 Floor Plans, Reflect Ceiling Plans, Roof Plan.

12.3.5 Finish and Door Schedules and Details.

12.3.4 Building Transverse and Longitudinal Sections.

12.3.5 Wall Sections.

12.3.6 Details: Provide details as required to support the design.

12.3.7 Furniture and Equipment Plans, Schedules and Details.

12.3.8 Interior Signage Schedule.

12.3.9 Specifications: Provide final specification. The Contractor shall make final identification of all materials and finishes at this stage.

12.3.10 Design Analysis: Complete calculations for acoustic analysis, structural elements and electrical and mechanical systems. Include computations for framing member sizing, sizing PM&E equipment, air duct design, and U-factors for ceilings, roofs and exterior walls and floors. Contractor shall employ commercially available energy analysis techniques to determine the energy performance of all passive systems and features. Use of hourly energy load computer simulation (e.g., TRNSYS, DOE 2.1 Blast, etc.) is recommended. These calculations can be used to size the mechanical systems. Based on the results of calculations, provide a complete list of the materials and equipment proposed for heating and plumbing, with the manufacturer's published cataloged product installation specifications and roughing-in data. The heating equipment data shall include the manufacturer's wiring diagrams, installation specifications, ARI certification, and the standard warranty for the equipment. Additional electrical requirements are indicated below.

12.3.11 Specific Mechanical and Plumbing Requirements:

12.3.11.1 Required Plans, Diagrams, Schedules and Details on Unit Mechanical Drawings (100% Unit Design Stages):

a. Mechanical Floor Plan: The floor plans shall show all principle architectural features of the building, which will affect the mechanical design. The floor plans shall also show the following:

Room designations.
Mechanical legend and applicable notes.
Location of all ductwork or piping (double line ductwork required).
Location and capacity of all terminal units (i.e., registers, diffusers, grilles, radiant heaters, hydronic baseboards). Exhaust fan location.
Size of all ductwork and piping.
Thermostat location.
Location of heating/cooling plant (i.e., furnace, condensing units, etc). Return air paths (i.e., undercut doors, transfer grilles).
Flue piping size and location.
Piping diagram for forced hot water system (if used).
Fuel supply and return piping

b. Equipment Schedule Slice: Complete equipment Schedules shall be provided. Schedule shall also include:

Capacity
Electrical characteristics

Efficiency (if applicable)
Manufacturer's name
Optional features to be provided
Physical size

c. Details: Construction details, sections, elevations, etc., shall be provided where required for clarification of methods and materials of design. Roof and exterior wall penetrations shall be detailed on the drawings.

12.3.11.2 Plumbing Floor Plan: The floor plan shall show all principal architectural features of the building, which will affect the plumbing design. Separate plumbing plans will not be required if sufficient information can be shown on the mechanical plans to meet the requirements shown above. The floor plan shall also show the following:

Room designations.
Fixture Schedule.
Location of utility entrances.
Waste and water pipe location and size.
Fixture designations.

12.3.12 Specific Electrical Requirements:

12.3.12.1 Required Plans, Diagrams, Schedules, and Details on Unit Electrical Drawings:

a. Electrical Floor Plan. The floor plans shall show all principle architectural features of the building, which will affect the electrical design. The floor plan shall also show the following:

Room designations.
Electrical legend and applicable notes.
Lighting fixtures, properly identified.
Location of smoke and CO detectors.
Location of telephone and cable TV outlets.
Switches for control of lighting.
Receptacles.
Location and designation of panelboards. Plans should clearly indicate type of mounting required (flush or surface) and be reflected accordingly in specifications.
Service entrance (conduit and main disconnect).
Location, designation and rating of motors and/or equipment, which requires electrical service. Show method of termination and/or connection to motors and/or equipment. Show necessary junction boxes, disconnects, controllers (approximate only), conduit stubs, and receptacles required to serve the motor and/or equipment.

b. Building Riser Diagram (from pad-mounted transformer to unit load center panelboard): Indicate the types and sizes of electrical equipment and wiring. Include grounding and metering requirements.

c. Unit Load Center Panelboard Schedule(s): Schedule shall indicate the following information:

Panelboard Characteristics (Panel Designation, Voltage, Phase, Wires, Main Breaker Rating and Mounting.
Branch Circuit Designations.
Load Designations.
Circuit Breaker Characteristics. (Number of Poles, Trip Rating, AIC Rating)
Branch Circuit Connected Loads (AMPS).
Special Features.

d. Lighting Fixture Schedule: (Schedule shall indicate the following information:)

Fixture Designation.
General Fixture Description.
Number and Type of Lamp(s).
Type of Mounting.
Special Features.

e. Details: Construction details, sections, elevations, etc., shall be provided where required for clarification of methods and materials of design.

f. Required Electrical Design Analysis: Design analysis and calculations for the electrical systems shall be prepared by a licensed professional engineer, and shall be stamped as such. The design analysis shall be separately bound, in one or more volumes. Show functional and engineering criteria, design information, and calculations applicable to the project. The analysis shall be organized in a format appropriate for review, approval, and record purposes. The design calculations shall indicate methods and references identified, and shall explain assumptions and conclusions.

g. Load Calculations: Provide a separate demand load calculation shall be provided for each type of individual living-unit (per NEC Art. 220).

h. Voltage Drop (VD) Calculations: Select conductor sizes of primary feeders, site lighting circuits, service laterals, and unit feeder conductors. Calculate maximum length for each phase of each primary circuit, using a maximum allowable VD for each circuit. Calculate voltage drops for each conductor. Maximum allowable voltage drop for site lighting and service laterals is 3%. The combined voltage drop for the service laterals, feeders, and branch circuit cannot exceed 5%. Calculate the available fault current at the main breaker for the special equipment panels. Provide a coordination study to support breaker selection.

13.0 DESIGN RELATED PRODUCTS

13.1 Color Samples: Provide three (3) sets of samples of colors showing color and pattern of materials prepared for interior and exterior finish materials, including floor, wall and ceiling finishes, roofing, siding, and trim. Submit to Contracting Officer on size 8-1/2" x 11" sample boards.

13.2 DD Form 1354: Three (3) sets of DD Form 1354, Transfer and Acceptance of Military Real Property shall be prepared in accordance with ER 415-345-38 and submitted to the Contracting Officer. Copies of Form 1354 and ER 415-345-38 will be furnished to the successful contractor following award of the project.

13.3 Submittal Register: The Contractor shall prepare in Resident Management System (RMS) Quality Control Module.

13.4 Reproduction: Upon Government approval of 100% design documents, the original will be returned to the Contractor for reproduction purposes. The Contractor will be responsible for his own reproduction as well as reproduction for Government use. The Government will require twice the number of copies of the plans and specifications as were required for the review stages, no color boards will be required. The originals will be retained by the Contractor for recording of as-built conditions. Upon completion of the project, the original design documents corrected to reflect as-built conditions will be supplied to the Government.

-End of Section-

SECTION 01111
SAFETY AND HEALTH REQUIREMENTS

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.

ENGINEERING MANUALS

EM 385-1-1	(1996) Safety and Health Requirements Manual

CODE OF FEDERAL REGULATIONS

29 CFR 1910	Occupational Safety and Health Standards, General Industry.
29 CFR 1926	Occupational Safety and Health Standards, Construction Industry.

1.2 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 DESCRIPTIONS:

SD-01 SD Data

Safety and Health Plan (Accident Prevention Plan); GA.

1.3 SAFETY REQUIREMENTS AND ACCIDENT PREVENTION:

1.3.1 Standards:

The Contractor shall comply with Occupational Safety and Health Act (OSHA) Standards, the Corps of Engineers Manual EM 385-1-1, "Safety and Health Requirements Manual," NFPA 101, and state, local, and facility safety requirements.

1.4 SAFETY AND HEALTH PLAN

1.4.1 Preparation and Implementation

An Accident Prevention Plan (AAP) shall be prepared covering onsite work to be performed by the Contractor and all subcontractors, and shall at a minimum address the requirements for an Accident Prevention Plan (APP), as contained in Appendix A, EM 385-1-1. The Safety and Health Manager shall be responsible for the development, implementation and oversight of the APP. The APP shall establish, in detail, the protocols necessary for the anticipation, recognition, evaluation, and control of hazards associated with each task performed. The APP shall address general safety and health requirements and procedures. The level of detail provided in the APP shall be tailored to the type of work, complexity of operations to be performed, and hazards anticipated. Details about some activities may not be available when the initial APP is prepared and submitted. Therefore, the APP shall

address, in as much detail as possible, anticipated tasks, their related hazards and anticipated control measures.

1.4.2 Acceptance and Modifications

Prior to submittal, the APP shall be signed and dated by the Contractor's Safety and Health Manager and the Site Superintendent. The APP shall be submitted for review at least [10] days prior to the Pre-work Safety Conference. Deficiencies in the APP will be discussed at the Pre-work Safety Conference, and the APP shall be revised to correct the deficiencies and resubmitted for acceptance. Onsite work shall not begin until the plan has been accepted. A copy of the written APP shall be maintained onsite. As work proceeds, the APP shall be adapted to new situations and new conditions. Changes and modifications to the accepted APP shall be made with the knowledge and concurrence of the Safety and Health Manager, the Site Superintendent, and the Contracting Officer. Should any unforeseen hazard become evident during the performance of the work, shall bring such hazard to the attention of the Safety and Health Manager, the Site Superintendent, and the Contracting Officer, both verbally and in writing, for resolution as soon as possible. In the interim, necessary action shall be taken to re-establish and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public, and the environment. Disregard for the provisions of this specification or the accepted APP shall be cause for stopping of work until the matter has been rectified to the satisfaction of the Contracting Officer.

1.4.3 Corps of Engineers Standards:

Corps of Engineers Manual EM 385-1-1, referred to in "ACCIDENT PREVENTION" article of Contract Clauses, is hereby highlighted, supplemented, or revised as follows:

1.4.3.1 Conflicts:

When a conflict exists between the Corps of Engineers Safety and Health Requirements Manual, other safety requirements, or the contract plans and/or specifications, the most stringent requirement shall prevail. (NAOSA 5 FEB 87).

1.4.3.2 Front End Loader - Backhoe Machines:

1.4.3.2.1 Non-compliance Safety Check:

All front end loader-backhoe machines and other machines, such as tractors that utilize a backhoe attachment, shall be checked for:

a. Exposed backhoe boom swing foot pedals.

b. Backhoe boom swing lever, which can be reached by a man standing on the ground or on the outrigger support bracket.

1.4.3.2.2 Correction and Fabrication of Non-compliance Safety Items:

Where these conditions exist, guards shall be fabricated to:

a. Cover over exposed foot pedals to prevent someone from accidentally stepping on them.

b. Enclose the swing lever so as to preclude operation from the ground or from the outrigger support bracket.

1.4.3.3 Attendance at Safety Meetings:

In order to allow for maximum attendance at weekly toolbox meetings and monthly supervisor meetings by Corps of Engineers personnel, the Contractor shall advise the CO's Office, a minimum of 48 hours before the start of each meeting, of the date, time and location of the Safety Meetings.

1.4.3.4 Minutes of Safety Meetings

Minutes shall be prepared by the Contractor and forwarded to the Contracting Officer by close of business the next workday.

1.4.3.5 Protective Footwear:

Protective footwear as defined by American National Standards Institute Z41 shall be worn by all working personnel on site.

1.4.3.6 Ground Fault Circuit Interrupters (GFCI):

GFCI's are required for work on this contract in accordance with EM 385-1-1. GFCI's are also required when using electric power extension cords.

1.4.3.7 Crawler-, Truck-, and Wheel-Mounted Cranes

Implementation of paragraph 16.D.05 shall include the following:

a. When a crane is performing duty cycle work (such as clamshell, dragline, grapple, or pile driving) it does not require anti-two block equipment. If the crane is required to make a non-duty cycle lift (for example, to lift a piece of equipment, a toolbox, or supplies), it will be exempt from the anti-two block equipment requirements if the following procedures are implemented:

(1) an international orange warning device (warning flag, warning tape, or warning ball) is properly secured to the hoist line at a distance of 8 to 10 feet above the hoist rigging;

(2) the signalperson (or an individual designated as the signalperson) acts as a spotter to alert the crane operator with a "STOP" signal when the warning device approaches the boom tip and the crane operator ceases hoisting functions when alerted of this; and

(3) while the non-duty cycle lift is underway, the signal person shall not stand under the load, shall have no duties other than signalperson, and shall comply with the signaling requirements of EM 385-1-1;

b. Anti-two block devices are always required when hoisting personnel by crane or derrick.

1.4.3.8 Fall Protection

Workers performing roof work and structural steel assembly shall utilize a fall protection system when exposed to falls of 6 feet or more.

1.4.4 Language

The on-site first line supervisors shall be capable of speaking the language of the crew and English.

2 PRODUCTS (THIS PART NOT USED)

3 EXECUTION (THIS PART NOT USED)

SECTION 01200
PROJECT MEETINGS

1 GENERAL

1.1 SUBMITTALS (NOT APPLICABLE)

1.2 PRECONSTRUCTION CONFERENCE

1.2.1 Scheduling

After award of the construction contract and prior to the start of any construction work, the Contracting Officer (CO) will schedule and conduct a preconstruction conference. The Contractor's Project Manager, Superintendent and Quality Control System Manager shall attend this meeting. The Contractor is encouraged to have an officer of his company (Project Manager could be this person) and representation from each of his sub-contractors at the conference. This conference will be held at a location and time as specified by the CO.

1.2.2 Purpose

The purpose of this preconstruction conference is to enable the CO to outline the procedures that will be followed by the Government in its administration of this construction contract and to discuss the performance that will be expected from the Contractor. This conference will allow the Contractor an opportunity to ask questions about the Government's supervision and inspection of contract work, about security requirements, regulations, etc. The CO may invite Using Service personnel and any other Government personnel to attend this conference.

1.2.3 Discussion Items

The following is a list of items for discussion during the preconstruction conference. However, the Contracting Officer may include additional items for discussion as conditions and the work requires.

a. Authority of the Area/Resident Engineer and organization of the Area/Resident office.

b. Contractor's Progress Schedule.

c. Correspondence Procedures.

d. Contractor Labor Standards Provisions.

e. Contract Modifications and Administrative Procedures.

f. Contractor's Administrative, Laydown and Storage Areas.

g. Procedures for Processing Submittals.

h. Payment Estimate Data and Procedures.

i. Contractor Utilities.

j. Security Requirements and Other Regulations, if applicable.

k. Government Furnished Equipment, if applicable.

l. Disposition of Salvage Property.

m. Contractor Performance Evaluation.

n. As-Built Drawings.

o. Warranty of Construction and Single Point of Contact.

p. Turnover of Completed Facilities.

1.3 OTHER MEETINGS

Other meetings may be held after the Preconstruction Conference, and such meetings may include the following:

a. Accident Prevention Safety Plan

b. Quality Control Plan.

c. Environmental Protection Plan.

d. Warranty Management Plan.

1.4 FACILITY MEETINGS

The Facility may also schedule meetings with the Contractor through the CO during the progress of construction work.

1.5 MINUTES OF MEETINGS

The Contractor will prepare minutes of the meeting and will provide the Government with a signed original for review and concurrence. The minutes shall include all items discussed at the meeting and the Contractor will make all corrections provided by the Government and resubmit the corrected minutes to the Government within seven days.

2 PRODUCTS (THIS PART NOT USED)

3 EXECUTION (THIS PART NOT USED)

SECTION 01312A
QUALITY CONTROL SYSTEM (QCS)
08/02

1.1 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

1.1.1 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.

1.1.2 Other Factors

Particular attention is directed to Contract Clause, "Schedules for Construction Contracts", Contract Clause, "Payments", Section 01320A, PROJECT SCHEDULE, 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.

1.2 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. Upon

specific justification and request by the Contractor, the Government can provide QCS on 3-1/2 inch high-density diskettes or CD-ROM. Any program updates of QCS will be made available to the Contractor via the Government RMS Website as they become available.

1.3 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 500 MHz Pentium or higher processor

128+ MB RAM for workstation / 256+ MB RAM for server

1 GB hard drive disk space for sole use by the QCS system

3 1/2 inch high-density floppy drive

Compact disk (CD) Reader, 8x speed or higher

SVGA or higher resolution monitor (1024 x 768, 256 colors)

Mouse or other pointing devise

Windows compatible printer (Laser printer must have 4+ MB of RAM)

Connection to the Internet, minimum 56 BPS

Software

MS Windows 98, ME, NT, or 2000

Word Processing software compatible with MS Word 97 or newer

Latest version of : Netscape Navigator, Microsoft Internet Explorer, or other browser that supports HTML 4.0 or higher

Electronic mail (E-mail), MAPI compatible

Virus protection software that is regularly upgraded with all issued manufacturer's updates

1.4 RELATED INFORMATION

1.4.1 QCS User Guide

After contract award, the Contractor shall download instructions for the installation and use of QCS from the Government RMS Internet Website; the Contractor can obtain the

current address from the Government. In case of justifiable difficulties, the Government will provide the Contractor with a CD-ROM containing these instructions.

1.4.2 Contractor Quality Control(CQC) Training

The use of QCS will be discussed with the Contractor's QC System Manager during the mandatory CQC Training class.

1.5 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.

1.6 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:

1.6.1 Administration

1.6.1.1 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.

1.6.1.2 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.

1.6.1.3 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".

1.6.1.5 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.

1.6.1.7 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.

1.6.2 Finances

1.6.2.1 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. The total of all CLINs equals the Contract Amount.

1.6.2.2 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.

1.6.3 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 01451A, 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.

1.6.3.1 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.

1.6.3.2 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 shall regularly update the correction status of both QC and QA punch list items.

1.6.3.3 Three-Phase Control Meetings

The Contractor shall maintain scheduled and actual dates and times of preparatory and initial control meetings in QCS.

1.6.3.4 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.

1.6.3.5 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.

1.6.3.6 QC Requirements

The Contractor shall develop and maintain a complete list of QC testing, transferred and installed property, and user training requirements in QCS. The Contractor shall update

all data on these QC requirements as work progresses, and shall promptly provide this information to the Government via QCS.

1.6.4 Submittal Management

The Government will provide the initial submittal register, ENG Form 4288, SUBMITTAL REGISTER, in electronic format. Thereafter, the Contractor shall maintain a complete list of all submittals, including completion of all data columns. 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.

1.6.5 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 updated schedule data shall be included with each pay request submitted by the Contractor.

1.6.6 Import/Export of Data

QCS includes the ability to export Contractor data to the Government and to import submittal register and other Government-provided data, and schedule data using SDEF.

1.7 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.

1.8 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:

1.8.1 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.

1.8.2 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.

1.8.3 File Names

The Government will provide the file names to be used by the Contractor with the QCS software.

1.9 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.

1.10 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.

SECTION 01320
PROJECT SCHEDULE
DESIGN-BUILD CONSTRUCTION

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 01330 SUBMITTAL PROCEDURES:

SD-07 Schedules

Preliminary Project Schedule; GA;

Initial 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's Representative for review with the Preliminary Project Schedule submission.

2. PRODUCTS (Not Applicable)

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 design, procurement and construction activities. Contractor management

personnel shall actively participate in its development. Designers, 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's Representative 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's Representative to evaluate Contractor progress for payment purposes. In the case where Project Schedule revisions have been directed by the Contracting Officer's Representative and those revisions have not been included in the Project Schedule, then the Contracting Officer's Representative 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. Software systems other than Primavera will require manual loading of scheduling and progress data into the Resident Management software system. 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's Representative.

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's Representative at the appropriate level of detail, as specified by the Contracting Officer's Representative, shall result in the disapproval of the schedule. The Contracting Officer's Representative 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's Representative 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

The Contractor shall integrate design and permitting activities, including necessary conferences and follow-up actions and design package submission dates into the schedule.

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: design reviews, submittal reviews, environmental permit approvals by State regulators, 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. 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

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 Standard Disk Exchange Format

Scheduling data shall be in Standard Disk Exchange Format (SDEF). Scheduling software, capable of producing an SDEF file shall electronically transfer activity data into the Resident Management System (RMS) Contractor Quality Control Modules. RMS requirements are described in specification section 01451.

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: an "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's Representative 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: an "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's Representative 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's Representative. The Contracting Officer's Representative 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 7 days shall not be allowed. Non-work periods of over 7 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.

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 20 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's Representative or to assess Contractor's progress. If the Contractor fails or refuses to furnish the information and project schedule data, which in the judgement of the Contracting Officer's Representative 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

Three data disks containing the project schedule shall be provided. Data on the disks shall be in the format approved by the COR.

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 WINDOWS operating system or on a WINDOWS formatted CD-ROM disk.

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 software version format of 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's Representative 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's Representative 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

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's Representative 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 Responsibility Report

A sort of the activities according to the contractor responsible for it’s completion.

3.5.4.6 Short Term Look Ahead Report

A sort of the activities scheduled to start or end within the next four-week period.

3.5.5 Network Diagram

The network diagram shall be required on the initial schedule submission and on monthly schedule update submissions where there is a schedule change. 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's Representative 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.

3.5.5.6 Short Term Look Ahead Report

A sort of the activities schedule to start and end within the next four-week period.

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's Representative 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's Representative. 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's Representative 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 Representative'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's Representative 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 Representative'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's Representative within 2 weeks of the NTP being issued. The proposed revisions to the schedule will be approved by the Contracting Officer's Representative prior to inclusion of those changes within the project schedule. If the Contractor fails to submit the proposed revisions, the Contracting Officer's Representative 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's Representative, then the Contractor shall advise the Contracting Officer's Representative 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 Representative'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 Representative's proposed revisions, the Contractor will be deemed to have concurred with the Contracting Officer's Representative'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 01330
SUBMITTAL PROCEDURES

10/2000

PART 1 GENERAL

1.1 SUBMITTAL IDENTIFICATION

Submittals required are identified by SD numbers and titles as follows:

SD-01 Preconstruction Submittals

SD-02 Shop Drawings

SD-03 Product Data

SD-04 Samples

SD-05 Design Data

SD-06 Test Reports

SD-07 Certificates

SD-08 Manufacturer's Instructions

SD-09 Manufacturer's Field Reports

SD-10 Operation and Maintenance Data

SD-11 Closeout Submittals

1.2 SUBMITTAL CLASSIFICATION

Submittals are classified as follows:

1.2.1 Designer of Record Approved.

Designer of Record approval is required for extensions of design, critical materials, any deviations from the solicitation, the accepted proposal, or the completed design, equipment whose compatibility with the entire system must be checked, and other items as designated by the Designer of Record or Contracting Officer's Representative. Within the terms of the Contract Clause entitled "Specifications and Drawings for Construction"; they are considered to be "shop drawings". The Contractor shall provide the Government the number of copies designated hereinafter of all Designer of Record approved submittals. The Government may review any or all Designer of Record approved submittals for conformance to the Solicitation and Accepted Proposal. The Government will review all submittals designated as deviating from the Solicitation or Accepted Proposal, as described below.

1.2.2 Government Approved Construction Submittals.

Administrative Contracting Officer approval is required for any deviations from the Solicitation or Accepted Proposal and other items as designated by the Contracting Officer'

Representative. Within the terms of the Contract Clause entitled "Specifications and Drawings for Construction"; they are considered to be "shop drawings".

1.2.3 Government Reviewed Extension of Design.

Government review is required for extension of design construction submittals, used to define contract conformity, and for deviation from the completed design. Review will be only for conformance with the contract requirements. Included are only those construction submittals for which the Designer of Record design documents do not include enough detail to ascertain contract compliance. Government review is not required for extensions of design such as structural steel or reinforcement shop drawings.

1.2.4 Information Only.

All submittals not requiring Designer of Record or Government approval will be for information only. They are not considered to be "shop drawings" within the terms of the Contract Clause referred to above.

1.1.5 GOVERNMENT REVIEWED OR "APPROVED" SUBMITTALS

The Contracting Officer's Representative conformance review or approval of submittals shall not be construed as a complete check, but will indicate only that the design, general method of construction, materials, detailing and other information appear to meet the Solicitation and Accepted Proposal. Government Review or approval will not relieve the Contractor of the responsibility for any error which may exist, as the Contractor, under the Design and CQC requirements of this contract, is responsible for design, dimensions, all design extensions, such as the design of adequate connections and details, etc., and the satisfactory construction of all work. After submittals have been reviewed for conformance or approved, as applicable, by the Contracting Officer' Representative, no re-submittal for the purpose of substituting materials or equipment will be considered unless accompanied by an explanation of why a substitution is necessary.

1.2 DISAPPROVED SUBMITTALS

The Contractor shall make all corrections required by the Contracting Officer's Representative, obtain the Designer of Record's approval, when applicable, and promptly furnish a corrected submittal in the form and number of copies specified for the initial submittal. Any "information only" submittal found to contain errors or unapproved deviations from the Solicitation or Accepted Proposal shall be resubmitted as one requiring "approval" action, requiring both Design of Record and Government approval. If the Contractor considers any correction indicated by the Government on the submittals to constitute a change to the contract, it shall promptly provide a notice in accordance with the Contract Clause "Changes" to the Contracting Officer's Representative.

1.3 WITHHOLDING OF PAYMENT

No payment for materials incorporated in the work will be made if all required Designer of Record or required Government approvals have not been obtained. No payment will be made for any materials incorporated into the work for any conformance review submittals or information only submittals found to contain errors or deviations from the Solicitation or Accepted Proposal.

PART 2 PRODUCTS (Not used)

PART 3 EXECUTION

3.1 GENERAL

The Contractor shall make submittals as required by the specifications. The Contracting Officer may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective sections. Units of weights and measures used on all submittals shall be the same as those used in the contract drawings. Each submittal shall be complete and in sufficient detail to allow ready determination of compliance with contract requirements. Prior to submittal, all items shall be checked and approved by the Contractor's Quality Control (CQC) System Manager and each item shall be stamped, signed, and dated by the CQC System Manager indicating action taken. Proposed deviations from the contract requirements shall be clearly identified. Submittals shall include items such as: Contractor's, manufacturer's, or fabricator's drawings; descriptive literature including (but not limited to) catalog cuts, diagrams, operating charts or curves; test reports; test cylinders; samples; O&M manuals (including parts list); certifications; warranties; and other such required submittals. Submittals requiring Government approval shall be scheduled and made prior to the acquisition of the material or equipment covered thereby. Samples remaining upon completion of the work shall be picked up and disposed of in accordance with manufacturer's Material Safety Data Sheets (MSDS) and in compliance with existing laws and regulations.

3.1.1 Design Submittals

The Contractor shall provide design submittals in accordance with Section 01012 entitled “DESIGN AFTER AWARD”.

3.2 SUBMITTAL REGISTER

The Contractor's Designer(s) of Record shall develop a complete list of submittals during design. The Designer of Record shall identify required submittals in the specifications. Use the list to prepare ENG Form 4288 Submittal Register or a computerized equivalent. The list may not be all-inclusive and additional submittals may be required by other parts of the contract. The Contractor is required to complete ENG Form 4288 (including columns "a" through "r") and submit to the Contracting Officer for approval within 30 calendar days after Notice to Proceed. The approved submittal register will serve as a scheduling document for submittals and will be used to control submittal actions throughout the contract period. The submit dates and need dates used in the submittal register shall be coordinated with dates in the Contractor prepared progress schedule. Updates to the submittal register showing the Contractor action codes and actual dates with Government action codes and actual dates shall be submitted monthly or until all submittals have been satisfactorily completed. When the progress schedule is revised, the submittal register shall also be revised and both submitted for approval.

3.3 SCHEDULING

Submittals covering component items forming a system or items that are interrelated shall be scheduled to be coordinated and submitted concurrently. Certifications to be submitted with the pertinent drawings shall be so scheduled. Adequate time (a minimum of 21 calendar days exclusive of mailing time) shall be allowed and shown on the register for review and approval. No delay damages or time extensions will be allowed for time lost in late submittals. An additional 7 calendar days shall be allowed and shown on the register for review and approval of submittals for HVAC control systems.

3.4 SUBMITTAL PROCEDURE

Submittals shall be made as follows:

3.4.1 Procedures

The Contractor shall be responsible for the scheduling and control of all submittals. The Contractor is responsible for confirming that the submittal register includes all submittals required by the contract documents.

In addition to those items listed on ENG Form 4288, the Contractor will furnish submittals for any deviation from the plans or specifications. The scheduled need dates must be recorded on the document for each item for control purposes and critical items must be tied to the contractor's approved schedule where applicable.

The Contractor will submit to the Contracting Officer for approval a minimum of five copies of all GA level submittals. Three copies of all FIO level submittals will be provided. The number of copies of submittals specified in this portion of the contract shall be complied with in lieu of four copies as specified by FAR 52.236-21.

For those contracts requiring Network Analysis System (NAS), the Contractor will schedule on the NAS critical items of equipment submittals and procurement activities, which will, or have the potential to, significantly impact project completion. The inclusion or exclusion of critical items shall be subject to the approval of the Contracting Officer.

Where ENG Form 4025 must be submitted prior to approval of the Construction Progress Schedule, the Contractor shall submit an initial annotated ENG Form 4288 upon which dates for submittal, approval and delivery of procurement items shall be included for the first 60 days of the work. Upon approval of the Construction Progress Schedule, or no later than 60 days after Notice to Proceed, the Contractor shall submit final annotated copies of ENG Form 4288. Dates shall be coordinated with the approved Construction Progress Schedule to logically interface with the sequence of construction. Critical item numbers will be shown on the listing if NAS is required.

Furnishing the schedule shall not be interpreted as relieving the Contractor of his obligation to comply with all the specification requirements for the items on the schedule. Contractor's Quality Control representative shall review the listing at least every 30 days and take appropriate action to maintain an effective system. The Contractor shall furnish a list each 30 days of all submittals on which either Government or Contractor's action is past due. He shall also furnish revised due dates in those cases when the original submittal schedule is no longer realistic. This monthly list of delayed items shall also be annotated by the Contractor to show what corrective action he is taking with regard to slippages in submittal schedule, which are attributable to actions by him, his subcontractors, or suppliers.

The Contractor shall provide a complete updated submittal register indicating the current status of all submittals when requested by the Contracting Officer in order to assure himself the schedule is being maintained.

The Contractor shall certify that each submittal is correct and in strict conformance with the contract drawings and specifications. All submittals not subject to the approval of the Contracting Officer will be submitted for information purposes only.

No Corps of Engineers action will be required prior to incorporating these items into the work, but the submittal shall be furnished to the Area/Resident Engineer not less than 2 weeks prior to procurement of Contractor certified material, equipment, etc.

These Contractor approved submittals will be used to verify that material received and used in the job is the same as that described and approved and will be used as record copies. All samples of materials submitted as required by these specifications shall be properly identified and labeled for ready identification, and upon being certified by the Contractor and reviewed by the Contracting officer, shall be stored at the site of the work for job site use until all work has been completed and accepted by the Contracting officer. Delegation of this approval authority to Contractor Quality Control does not relieve the Contractor from the obligation to conform to any contract requirement and will not prevent the Contracting Officer from requiring removal and replacement of construction not in contract conformance; nor does it relieve the Contractor from the requirement to furnish "samples" for testing by the Government Laboratory or check testing by the Government in those instances where the technical specifications so prescribe.

Contractor certified drawings would be subject to quality assurance review by the Government at any time during the duration of the contract. No adjustment for time or money will be allowed for corrections required as a result of noncompliance with plans and specifications.

Submittals Requiring Government Approval (GA). Where the review authority is designated to the Government, the Contractor is required to sign the certification on ENG Form 4025 in the box beside the remarks block in Section I. The Government will code the items in block h and sign the approval action block in Section II as the approving authority.

Operating and Maintenance Instructions. Six complete sets of instructions containing the manufacturers operating and maintenance instructions for each piece of equipment shall be furnished. Each set shall be permanently bound and shall have a hard cover. One complete set shall be furnished at the time test procedures are submitted. Remaining sets shall be furnished before the contract is completed. The following identification shall be inscribed on the covers: The words "OPERATING AND MAINTENANCE INSTRUCTIONS," name and location of the facility, name of the Contractor, and contract number. Flysheets shall be placed before instructions covering each subject. Instruction sheets shall be approximately 8-1/2 by 11 inches, with large sheets of drawings folded in. Instructions shall include but are not limited to:

(1) System layout showing piping, valves and controls;

(2) Approved wiring and control diagrams;

(3) A control sequence describing startup, operation and shutdown;

(4) Operating and maintenance instructions for each piece of equipment, including lubrication instructions and troubleshooting guide; and

(5) Manufacturer's bulletins, cuts and descriptive data; parts lists and recommended parts.

The Government will further discuss the submittal procedures at the Pre-Construction Conference.

3.4.2 Deviations

For submittals, which include proposed deviations requested by the Contractor, the column "variation" of ENG Form 4025 shall be checked. The Contractor shall set forth in writing the reason for any deviations and annotate such deviations on the submittal. As stated above, the Contractor’s Designer of Record approval is required for any proposed deviations. The Government reserves the right to rescind inadvertent approval of submittals containing unnoted deviations.

3.5 CONTROL OF SUBMITTALS

The Contractor shall carefully control his procurement operations to ensure that each individual submittal is made on or before the Contractor scheduled submittal date shown on the approved "Submittal Register."

3.6 GOVERNMENT CONFORMANCE REVIEW AND APPROVED SUBMITTALS

Upon completion of review of submittals requiring Government approval, the submittals will be identified as having received approval by being so stamped and dated. The Contracting Officer will retain three copies of the submittal and 3 copies of the submittal will be returned to the Contractor. If the Government performs a conformance review of other Designer of Record approved submittals, the submittals will be so identified and returned, as described above.

3.7 INFORMATION ONLY SUBMITTALS

Normally submittals for information only will not be returned. Approval of the Contracting Officer is not required on information only submittals. The Government reserves the right to require the Contractor to resubmit any item found not to comply with the contract. This does not relieve the Contractor from the obligation to furnish material conforming to the plans and specifications; will not prevent the Contracting Officer from requiring removal and replacement of nonconforming material incorporated in the work; and does not relieve the Contractor of the requirement to furnish samples for testing by the Government laboratory or for check testing by the Government in those instances where the technical specifications so prescribe.

3.8 STAMPS

Stamps used by the Contractor on the submittal data to certify that the submittal meets contract requirements shall be similar to the following:

CONTRACTOR
(Firm Name)

____ Approved
____ Approved with corrections as noted on the submittal data and/or attached sheets.

SIGNATURE:_____

TITLE: (DESIGNER OF RECORD)

DATE:_____

SECTION 01355A
ENVIRONMENTAL PROTECTION
02/02

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.

U.S. ARMY (DA)

AR 200-5Pest Management

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

33 CFR 328Definitions

40 CFR 68Chemical Accident Prevention Provisions

40 CFR 152 - 186Pesticide Programs

40 CFR 260Hazardous Waste Management System: General

40 CFR 261Identification and Listing of Hazardous Waste

40 CFR 262Standards Applicable to Generators of Hazardous Waste

40 CFR 279Standards for the Management of Used Oil

40 CFR 302Designation, Reportable Quantities, and Notification

40 CFR 355Emergency Planning and Notification

49 CFR 171 - 178Hazardous Materials Regulations

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1(1996) U.S. Army Corps on Engineers Safety and Health Requirements Manual

WETLAND MANUALCorps of Engineers Wetlands Delineation Manual Technical Report Y-87-1

NOTE: Add any State, Facility, Installation, or Project specific requirements. An example would be "NORTH DAKOTA ADMINISTRATION CODE" or "GRAND FORKS AFB SPECIFIC REGULATIONS".

1.2 DEFINITIONS

1.2.1 Environmental Pollution and Damage

Environmental pollution and damage is the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade the environment aesthetically, culturally and/or historically.

1.2.2 Environmental Protection

Environmental protection is the prevention/control of pollution and habitat disruption that may occur to the environment during construction. The control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.2.3 Contractor Generated Hazardous Waste

Contractor generated hazardous waste means materials that, if abandoned or disposed of, may meet the definition of a hazardous waste. These waste streams would typically consist of material brought on site by the Contractor to execute work, but are not fully consumed during the course of construction. Examples include, but are not limited to, excess paint thinners (i.e. methyl ethyl ketone, toluene etc.), waste thinners,excess paints, excess solvents, waste solvents, and excess pesticides, and contaminated pesticide equipment rinse water.

1.2.4 Installation Pest Management Coordinator

Installation Pest Management Coordinator (IPMC) is the individual officially designated by the Installation Commander to oversee the Installation Pest Management Program and the Installation Pest Management Plan.

1.2.4 Project Pesticide Coordinator

The Project Pesticide Coordinator (PPC) is an individual that resides at a Civil Works Project office and that is responsible for oversight of pesticide application on Project grounds.

1.2.5 Land Application for Discharge Water

The term "Land Application" for discharge water implies that the Contractor shall discharge water at a rate which allows the water to percolate into the soil. No sheeting action, soil erosion, discharge into storm sewers, discharge into defined drainage areas,

or discharge into the "waters of the United States" shall occur. Land Application shall be in compliance with all applicable Federal, State, and local laws and regulations.

1.2.6 Pesticide

Pesticide is defined as any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest, or intended for use as a plant regulator, defoliant or desiccant.

1.2.7 Pests

The term "pests" means arthropods, birds, rodents, nematodes, fungi, bacteria, viruses, algae, snails, marine borers, snakes, weeds and other organisms (except for human or animal disease-causing organisms) that adversely affect readiness, military operations, or the well-being of personnel and animals; attack or damage real property, supplies, equipment, or vegetation; or are otherwise undesirable.

1.2.8 Surface Discharge

The term "Surface Discharge" implies that the water is discharged with possible sheeting action and subsequent soil erosion may occur. Waters that are surface discharged may terminate in drainage ditches, storm sewers,creeks, and/or "waters of the United States" and would require a permit to discharge water from the governing agency.

1.2.9 Waters of the United States

All waters which are under the jurisdiction of the Clean Water Act, as defined in 33 CFR 328.

1.2.10 Wetlands

Wetlands means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, and bogs. Official determination of whether or not an area is classified as a wetland must be done in accordance with WETLAND MANUAL.

1.3 GENERAL REQUIREMENTS

The Contractor shall minimize environmental pollution and damage that may occur as the result of construction operations. The environmental resources within the project boundaries and those affected outside the limits of permanent work shall be protected during the entire duration of this contract. The Contractor shall comply with all applicable environmental Federal, State, and local laws and regulations. The Contractor shall be responsible for any delays resulting from failure to comply with environmental laws and regulations.

1.4 SUBCONTRACTORS

The Contractor shall ensure compliance with this section by subcontractors.

1.5 PAYMENT

No separate payment will be made for work covered under this section. The Contractor shall be responsible for payment of fees associated with environmental permits, application, and/or notices obtained by the Contractor. All costs associated with this section shall be included in the contract price. The Contractor shall be responsible for payment of all fines/fees for violation or non-compliance with Federal, State, Regional and local laws and regulations.

1.6 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Environmental Protection Plan; G, COE

The environmental protection plan.

1.7 ENVIRONMENTAL PROTECTION PLAN

NOTE: The Environmental Protection Plan is to be edited to include any additional environmental concerns or plans that may be required for the construction Contractor to protect the environment during construction of the project. The Designer should coordinate the requirements with the Facility, Installation, or Project Environmental Offices in addition to the Federal, State Regional and Local governing agencies.

Prior to commencing construction activities or delivery of materials to the site, the Contractor shall submit an Environmental Protection Plan for review and approval by the Contracting Officer. The purpose of the Environmental Protection Plan is to present a comprehensive overview of known or potential environmental issues which the Contractor must address during construction. Issues of concern shall be defined within the Environmental Protection Plan as outlined in this section. The Contractor shall address each topic at a level of detail commensurate with the environmental issue and required construction task(s). Topics or issues which are not identified in this section, but which the Contractor considers necessary, shall be identified and discussed after those items formally identified in this section. Prior to submittal of the Environmental Protection Plan, the Contractor shall meet with the Contracting Officer for the purpose of discussing the implementation of the initial Environmental Protection Plan; possible subsequent additions and revisions to the plan including any reporting requirements; and methods for administration of the Contractor's Environmental Plans. The Environmental Protection Plan shall be current and maintained onsite by the Contractor.

1.7.1 Compliance

No requirement in this Section shall be construed as relieving the Contractor of any applicable Federal, State, and local environmental protection laws and regulations. During Construction, the Contractor shall be responsible for identifying, implementing, and submitting for approval any additional requirements to be included in the Environmental Protection Plan.

1.7.2 Contents

The environmental protection plan shall include, but shall not be limited to, the following:

a. Name(s) of person(s) within the Contractor's organization who is(are) responsible for ensuring adherence to the Environmental Protection Plan.

b. Name(s) and qualifications of person(s) responsible for manifesting hazardous waste to be removed from the site, if applicable.

c. Name(s) and qualifications of person(s) responsible for training the Contractor's environmental protection personnel.

d. Description of the Contractor's environmental protection personnel training program.

e. An erosion and sediment control plan which identifies the type and location of the erosion and sediment controls to be provided. The plan shall include monitoring and reporting requirements to assure that the control measures are in compliance with the erosion and sediment control plan, Federal, State, and local laws and regulations. A Storm Water Pollution Prevention Plan (SWPPP) may be substituted for this plan.

f. Drawings showing locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on the site.

g. Traffic control plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Plan shall include measures to minimize the amount of mud transported onto paved public roads by vehicles or runoff.

h. Work area plan showing the proposed activity in each portion of the area and identifying the areas of limited use or nonuse. Plan should include measures for marking the limits of use areas including methods for protection of features to be preserved within authorized work areas.

i. Drawing showing the location of borrow areas.

j. The Spill Control plan shall include the procedures, instructions, and reports to be used in the event of an unforeseen spill of a substance regulated by 40 CFR 68, 40 CFR 302, 40 CFR 355, and/or regulated under State or Local laws and regulations. The Spill Control Plan supplements the requirements of EM 385-1-1 and the Fort Lee Stormwater Pollution Prevention Plan. This plan shall include as a minimum:

1. The name of the individual who will report any spills or hazardous substance releases and who will follow up with complete documentation. This individual shall immediately notify the Contracting Officer and Facility Fire Department, Facility Environmental Office in addition to the legally required Federal, State, and local reporting channels (including the National Response Center 1-800-424-8802) if a reportable quantity is released to the environment. The plan shall contain a list of the required reporting channels and telephone numbers.

2. The name and qualifications of the individual who will be responsible for implementing and supervising the containment and cleanup.

3. Training requirements for Contractor's personnel and methods of accomplishing the training.

4. A list of materials and equipment to be immediately available at the job site, tailored to cleanup work of the potential hazard(s) identified.

5. The names and locations of suppliers of containment materials and locations of additional fuel oil recovery, cleanup, restoration, and material-placement equipment available in case of an unforeseen spill emergency.

6. The methods and procedures to be used for expeditious contaminant cleanup.

k. A non-hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris. The plan shall include schedules for disposal. The Contractor shall identify any subcontractors responsible for the transportation and disposal of solid waste. Licenses or permits shall be submitted for solid waste disposal sites that are not a commercial operating facility. Evidence of the disposal facility's acceptance of the solid waste shall be attached to this plan during the construction. The Contractor shall attach a copy of each of the Non-hazardous Solid Waste Diversion Reports to the disposal plan. The report shall be submitted on the first working day after the first quarter that non-hazardous solid waste has been disposed and/or diverted and shall be for the previous quarter (e.g. the first working day of January, April, July, and October). The report shall indicate the total amount of waste generated and total amount of waste diverted in cubic meters yards or tons along with the percent that was diverted.

l. A recycling and solid waste minimization plan with a list of measures to reduce consumption of energy and natural resources. The plan shall detail the Contractor's actions to comply with and to participate in Federal, State, Regional, and local government sponsored recycling programs to reduce the volume of solid waste at the source.

m. An air pollution control plan detailing provisions to assure that dust, debris, materials, trash, etc., do not become air borne and travel off the project site.

n. A contaminant prevention plan that: identifies potentially hazardous substances to be used on the job site; identifies the intended actions to prevent introduction of such materials into the air, water, or ground; and details provisions for compliance with Federal, State, and local laws and regulations for storage and handling of these materials. In accordance with EM 385-1-1, a copy of the Material Safety Data Sheets

(MSDS) and the maximum quantity of each hazardous material to be on site at any given time shall be included in the contaminant prevention plan. As new hazardous materials are brought on site or removed from the site, the plan shall be updated.

o. A waste water management plan that identifies the methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines. If a settling/retention pond is required, the plan shall include the design of the pond including drawings, removal plan, and testing requirements for possible pollutants. If land application will be the method of disposal for the waste water, the plan shall include a sketch showing the location for land application along with a description of the pretreatment methods to be implemented. If surface discharge will be the method of disposal, a copy of the permit and associated documents shall be included as an attachment prior to discharging the waste water. If disposal is to a sanitary sewer, the plan shall include documentation that the Waste Water Treatment Plant Operator has approved the flow rate, volume, and type of discharge.

p. A historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands known to be on the project site: and/or identifies procedures to be followed if historical archaeological, cultural resources, biological resources and wetlands not previously known to be onsite or in the area are discovered during construction. The plan shall include methods to assure the protection of known or discovered resources and shall identify lines of communication between Contractor personnel and the Contracting Officer.

q. A pesticide treatment plan shall be included and updated, as information becomes available. The plan shall include: sequence of treatment, dates, times, locations, pesticide trade name, EPA registration numbers, authorized uses, chemical composition, formulation, original and applied concentration, application rates of active ingredient (i.e. pounds of active ingredient applied), equipment used for application and calibration of equipment. The Contractor is responsible for Federal, State, Regional and Local pest management record keeping and reporting requirements as well as any additional Installation Project Office specific requirements. The Contractor shall follow AR 200-5 Pest Management, Chapter 2, Section III "Pest Management Records and Reports" for data required to be reported to the Installation, and all applicable requirements in Chapter 4 Site Engineering of the Statement of Work.

1.7.3 Appendix

Copies of all environmental permits, permit application packages, approvals to construct, notifications, certifications, reports, and termination documents shall be attached,as an appendix, to the Environmental Protection Plan.

1.8 PROTECTION FEATURES

This paragraph supplements the Contract Clause PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS. Prior to start of any onsite construction activities, the Contractor and the Contracting Officer shall make a joint condition survey. Immediately following the survey, the

Contractor shall prepare a brief report including a plan describing the features requiring protection under the provisions of the Contract Clauses, which are not specifically identified on the drawings as environmental features requiring protection along with the condition of trees, shrubs and grassed areas immediately adjacent to the site of work and adjacent to the Contractor's assigned storage area and access route(s), as applicable. This survey report shall be signed by both the the Contractor and the Contracting Officer upon mutual agreement as to its accuracy and completeness. The Contractor shall protect those environmental features included in the survey report and any indicated on the drawings, regardless of interference which their preservation may cause to the Contractor's work under the contract.

1.9 SPECIAL ENVIRONMENTAL REQUIREMENTS

The Contractor shall comply with the special environmental requirements specified in Paragraph 3-3 Existing Conditions in Chapter 3 of the Statement of Work.

1.10 ENVIRONMENTAL ASSESSMENT OF CONTRACT DEVIATIONS

Any deviations, requested by the Contractor, from the drawings,plans and specifications which may have an environmental impact will be subject to approval by the Contracting Officer and may require an extended review, processing, and approval time. The Contracting Officer reserves the right to disapprove alternate methods, even if they are more cost effective, if the Contracting Officer determines that the proposed alternate method will have an adverse environmental impact.

1.11 NOTIFICATION

The Contracting Officer will notify the Contractor in writing of any observed noncompliance with Federal, State or local environmental laws or regulations, permits, and other elements of the Contractor's Environmental Protection plan. The Contractor shall, after receipt of such notice, inform the Contracting Officer of the proposed corrective action and take such action when approved by the Contracting Officer. The Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No time extensions shall be granted or equitable adjustments allowed to the Contractor for any such suspensions. This is in addition to any other actions the Contracting Officer may take under the contract, or in accordance with the Federal Acquisition Regulation or Federal Law.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 ENVIRONMENTAL PERMITS AND COMMITMENTS

The Contractor shall be responsible for obtaining and complying with all environmental permits and commitments required by Federal, State, Regional, and local environmental laws and regulations.

3.2 LAND RESOURCES

The Contractor shall confine all activities to areas defined by the drawings and specifications. Prior to the beginning of any construction, the Contractor shall identify any land resources to be preserved within the work area. Except in areas indicated on the drawings or specified to be cleared, the Contractor shall not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, and land forms without approval. No ropes, cables, or guys shall be fastened to or attached to any trees for anchorage unless specifically authorized. The Contractor shall provide effective protection for land and vegetation resources at all times as defined in the following subparagraphs. Stone, soil, or other materials displaced into uncleared areas shall be removed by the Contractor.

3.2.1 Work Area Limits

Prior to commencing construction activities, the Contractor shall mark the areas that need not be disturbed under this contract. Isolated areas within the general work area which are not to be disturbed shall be marked or fenced. Monuments and markers shall be protected before construction operations commence. Where construction operations are to be conducted during darkness, any markers shall be visible in the dark. The Contractor's personnel shall be knowledgeable of the purpose for marking and/or protecting particular objects.

3.2.2 Landscape

Trees, shrubs, vines, grasses, land forms and other landscape features indicated and defined on the drawings to be preserved shall be clearly identified by marking, fencing, or wrapping with boards, or any other approved techniques. The Contractor shall restore landscape features damaged or destroyed during construction operations outside the limits of the approved work area.

3.2.3 Erosion and Sediment Controls

The Contractor shall be responsible for providing erosion and sediment control measures in accordance with Federal, State, and local laws and regulations. The erosion and sediment controls selected and maintained by the Contractor shall be such that water quality standards are not violated as a result of the Contractor's construction activities. The area of bare soil exposed at any one time by construction operations should be kept to a minimum. The Contractor shall construct or install temporary and permanent erosion and sediment control best management practices (BMPs) as specified in Attachment 9 to the Statement of Work. BMPs may include, but not be limited to, vegetation cover, stream bank stabilization, slope stabilization, silt fences, construction of terraces, interceptor channels, sediment traps, inlet and outfall protection, diversion channels, and sedimentation basins. Any temporary measures shall be removed after the area has been stabilized.

3.2.4 Contractor Facilities and Work Areas

The Contractor's field offices, staging areas, stockpile storage, and temporary buildings shall be placed in areas designated on the drawings or as directed by the Contracting Officer. Temporary movement or relocation of Contractor facilities shall be made only

when approved. Erosion and sediment controls shall be provided for on-site borrow and spoil areas to prevent sediment from entering nearby waters. Temporary excavation and embankments for plant and/or work areas shall be controlled to protect adjacent areas.

3.3 WATER RESOURCES

The Contractor shall monitor construction activities to prevent pollution of surface and ground waters. Toxic or hazardous chemicals shall not be applied to soil or vegetation unless otherwise indicated. All water areas affected by construction activities shall be monitored by the Contractor. For construction activities immediately adjacent to impaired surface waters, the Contractor shall be capable of quantifying sediment or pollutant loading to that surface water when required by State or Federally issued Clean Water Act permits.

3.3.1 Cofferdams, Diversions, and Dewatering Operations

Construction operations for dewatering shall be controlled at all times to maintain compliance with existing State water quality standards and designated uses of the surface water body. The Contractor shall comply with the State of Virginia water quality standards and anti-degradation provisions.

3.4 AIR RESOURCES

Equipment operation, activities, or processes performed by the Contractor shall be in accordance with all Federal and State air emission and performance laws and standards.

3.4.1 Particulates

Dust particles; aerosols and gaseous by-products from construction activities; and processing and preparation of materials, such as from asphaltic batch plants; shall be controlled at all times, including weekends, holidays and hours when work is not in progress. The Contractor shall maintain excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and other work areas within or outside the project boundaries free from particulates which would cause the Federal, State, and local air pollution standards to be exceeded or which would cause a hazard or a nuisance. Sprinkling, chemical treatment of an approved type, baghouse, scrubbers, electrostatic precipitators or other methods will be permitted to control particulates in the work area. Sprinkling, to be efficient, must be repeated to keep the disturbed area damp at all times. The Contractor must have sufficient, competent equipment available to accomplish these tasks. Particulate control shall be performed as the work proceeds and whenever a particulate nuisance or hazard occurs. The Contractor shall comply with all State and local visibility regulations.

3.4.2 Odors

Odors from construction activities shall be controlled at all times. The odors shall not cause a health hazard and shall be in compliance with State regulations and/or local ordinances.

3.4.3 Sound Intrusions

The Contractor shall keep construction activities under surveillance and control to minimize environment damage by noise.

3.4.4 Burning

Burning shall be prohibited on the Government premises.

3.5 NOT USED

3.6 CHEMICAL MATERIALS MANAGEMENT AND WASTE DISPOSAL

Disposal of wastes shall be as directed below, unless otherwise specified in other sections and/or shown on the drawings.

3.6.1 Solid Wastes

Solid wastes (excluding clearing debris) shall be placed in containers which are emptied on a regular schedule. Handling, storage, and disposal shall be conducted to prevent contamination. Segregation measures shall be employed so that no hazardous or toxic waste will become co-mingled with solid waste. The Contractor shall transport solid waste off Government property and dispose of it in compliance with Federal, State, and local requirements for solid waste disposal. The Contractor shall comply with Federal, State, and local laws and regulations pertaining to the use of landfill areas.

3.6.2 Chemicals and Chemical Wastes

Chemicals shall be dispensed ensuring no spillage to the ground or water. Periodic inspections of dispensing areas to identify leakage and initiate corrective action shall be performed and documented. This documentation will be periodically reviewed by the Government. Chemical waste shall be collected in corrosion resistant, compatible containers. Collection drums shall be monitored and removed to a staging or storage area when contents are within 150 mm 6 inches of the top. Wastes shall be classified, managed, stored, and disposed of in accordance with Federal, State, and local laws and regulations.

3.6.3 Contractor Generated Hazardous Wastes/Excess Hazardous Materials

Hazardous wastes are defined in 40 CFR 261, or are as defined by applicable State and local regulations. Hazardous materials are defined in 49 CFR 171 - 178. The Contractor shall, at a minimum, manage and store hazardous waste in compliance with 40 CFR 262 and shall manage and store hazardous waste in accordance with the Installation hazardous waste management plan. The Contractor shall take sufficient measures to prevent spillage of hazardous and toxic materials during dispensing. The Contractor shall segregate hazardous waste from other materials and wastes, shall protect it from the weather by placing it in a safe covered location, and shall take precautionary measures such as berming or other appropriate measures against accidental spillage. The Contractor shall be responsible for storage, describing,

packaging, labeling, marking, and placarding of hazardous waste and hazardous material in accordance with 49 CFR 171 - 178, State, and local laws and regulations. The Contractor shall transport Contractor generated hazardous waste off Government property within 30 days in accordance with the Environmental Protection Agency and the Department of Transportation laws and regulations. The Contractor shall dispose of hazardous waste in compliance with Federal, State and local laws and regulations. Spills of hazardous or toxic materials shall be immediately reported to the Contracting Officer and the Facility Environmental Office. Cleanup and cleanup costs due to spills shall be the Contractor's responsibility. The disposition of Contractor generated hazardous waste and excess hazardous materials are the Contractor's responsibility. The Contractor shall report the disposition of hazardous waste to the Contracting Officer.

3.6.4 Fuel and Lubricants

Storage, fueling and lubrication of equipment and motor vehicles shall be conducted in a manner that affords the maximum protection against spill and evaporation. Fuel, lubricants and oil shall be managed and stored in accordance with all Federal, State, Regional, and local laws and regulations. Used lubricants and used oil to be discarded shall be stored in marked corrosion-resistant containers and recycled or disposed in accordance with 40 CFR 279, State, and local laws and regulations. Storage of fuel on the project site shall be accordance with all Federal, State, and local laws and regulations.

3.6.5 Waste Water

Disposal of waste water shall be as specified below.

a. Waste water from construction activities, such as onsite material processing, concrete curing, foundation and concrete clean-up, water used in concrete trucks, forms, etc. shall not be allowed to enter water ways or to be discharged prior to being treated to remove pollutants. The Contractor shall dispose of the construction related waste water off-Government property in accordance with all Federal, State, Regional and Local laws and regulations or by collecting and placing it in a grit trap where suspended material can be settled out and/or the water can evaporate to separate pollutants from the water. The site for the grit trap shall be coordinated and approved with the Contracting Officer. The residue left in the trap prior to completion of the project shall be removed, tested, and disposed off-Government property in accordance with Federal, State, and local laws and regulations. The area shall be backfilled to the original grade, top-soiled and seeded/sodded.

b. For discharge of ground water, the Contractor shall surface discharge in accordance with the requirements of the State UPDES STORM WATER DISCHARGES FROM CONSTRUCTION SITES permit.

c. Water generated from the flushing of lines after disinfection or disinfection in conjunction with hydrostatic testing shall be land applied in accordance with all Federal, State, and local laws and regulations for land application or if allowed it shall be discharged into the sanitary sewer with prior approval and/or notification to the Waste Water Treatment Plant's Operator.

3.7 RECYCLING AND WASTE MINIMIZATION

The Contractor shall participate in State and local government sponsored recycling programs. The Contractor is further encouraged to minimize solid waste generation throughout the duration of the project.

3.8 NON-HAZARDOUS SOLID WASTE DIVERSION REPORT

The Contractor shall maintain an inventory of non-hazardous solid waste diversion and disposal of construction and demolition debris. The Contractor shall submit a report to the Contracting Officer on the first working day after each fiscal year quarter, starting the first quarter that non-hazardous solid waste has been generated. The following shall be included in the report:

a. Construction and Demolition (C&D) Debris Disposed = cubic yards or tons, as appropriate.

b. Construction and Demolition (C&D) Debris Recycled = cubic yards or tons, as appropriate.

c. Total C&D Debris Generated = cubic yards or tons, as appropriate.

d. Waste Sent to Waste-To-Energy Incineration Plant (This amount should not be included in the recycled amount) =, cubic yards or tons, as appropriate.

3.9 HISTORICAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

If during excavation or other construction activities any previously unidentified or unanticipated historical, archaeological, and cultural resources are discovered or found, all activities that may damage or alter such resources shall be temporarily suspended. Resources covered by this paragraph include but are not limited to: any human skeletal remains or burials; artifacts; shell, midden, bone, charcoal, or other deposits; rock or coral alignments, pavings, wall, or other constructed features; and any indication of agricultural or other human activities. Upon such discovery or find, the Contractor shall immediately notify the Contracting Officer so that the appropriate authorities may be notified and a determination made as to their significance and what, if any, special disposition of the finds should be made. The Contractor shall cease all activities that may result in impact to or the destruction of these resources. The Contractor shall secure the area and prevent employees or other persons from trespassing on, removing, or otherwise disturbing such resources.

3.10 BIOLOGICAL RESOURCES

The Contractor shall minimize interference with, disturbance to, and damage to fish, wildlife, and plants including their habitat. The Contractor shall be responsible for the protection of threatened and endangered animal and plant species including their habitat in accordance with Federal, State, Regional, and local laws and regulations.

3.11 INTEGRATED PEST MANAGEMENT

In order to minimize impacts to existing fauna and flora, the Contractor, through the Contracting Officer, shall coordinate with the Installation Pest Management Coordinator (IPMC) at the earliest possible time prior to pesticide application. The Contractor shall discuss integrated pest management strategies with the IPMC and receive concurrence from the IPMC through the COR prior to the application of any pesticide associated with these specifications. Installation Project Office Pest Management personnel shall be given the opportunity to be present at all meetings concerning treatment measures for pest or disease control and during application of the pesticide. For termite requirements see Chapter 4 Site Engineering of the Statement of Work. The use and management of pesticides are regulated under 40 CFR 152 - 186.

3.11.1 Pesticide Delivery and Storage

Pesticides shall be delivered to the site in the original, unopened containers bearing legible labels indicating the EPA registration number and the manufacturer's registered uses. Pesticides shall be stored according to manufacturer's instructions and under lock and key when unattended.

3.11.2 Qualifications

For the application of pesticides, the Contractor shall use the services of a subcontractor whose principal business is pest control. The subcontractor shall be licensed and certified in the state where the work is to be performed.

3.11.3 Pesticide Handling Requirements

The Contractor shall formulate, treat with, and dispose of pesticides and associated containers in accordance with label directions and shall use the clothing and personal protective equipment specified on the labeling for use during all phases of the application. Material Safety Data Sheets (MSDS)shall be available for all pesticide products.

3.11.4 Application

Pesticides shall be applied by a State Certified Pesticide Applicator in accordance with EPA label restrictions and recommendation. The Certified Applicator shall wear clothing and personal protective equipment as specified on the pesticide label. Water used for formulating shall only come from locations designated by the Contracting Officer. The Contractor shall not allow the equipment to overflow. Prior to application of pesticide, all equipment shall be inspected for leaks, clogging, wear, or damage and shall be repaired prior to being used.

3.12 PREVIOUSLY USED EQUIPMENT

The Contractor shall clean all previously used construction equipment prior to bringing it onto the project site. The Contractor shall ensure that the equipment is free from soil residuals, egg deposits from plant pests, noxious weeds, and plant seeds. The Contractor shall consult with the USDA jurisdictional office for additional cleaning requirements.

3.13 MAINTENANCE OF POLLUTION FACILITIES

The Contractor shall maintain permanent and temporary pollution control facilities and devices for the duration of the contract or for that length of time construction activities create the particular pollutant.

3.14 MILITARY MUNITIONS

In the event the Contractor discovers or uncovers military munitions as defined in 40 CFR 260, the Contractor shall immediately stop work in that area and immediately inform the Contracting Officer.

3.15 TRAINING OF CONTRACTOR PERSONNEL

The Contractor's personnel shall be trained in all phases of environmental protection and pollution control. The Contractor shall conduct environmental protection/pollution control meetings for all Contractor personnel prior to commencing construction activities. Additional meetings shall be conducted for new personnel and when site conditions change. The training and meeting agenda shall include: methods of detecting and avoiding pollution; familiarization with statutory and contractual pollution standards; installation and care of devices, vegetative covers, and instruments required for monitoring purposes to ensure adequate and continuous environmental protection/pollution control; anticipated hazardous or toxic chemicals or wastes, and other regulated contaminants; recognition and protection of archaeological sites, artifacts, wetlands, and endangered species and their habitat that are known to be in the area.

3.16 NOT USED

3.17 POST CONSTRUCTION CLEANUP

The Contractor shall clean up all areas used for construction in accordance with Contract Clause: "Cleaning Up". The Contractor shall, unless otherwise instructed in writing by the Contracting Officer, obliterate all signs of temporary construction facilities such as haul roads, work area, structures, foundations of temporary structures, stockpiles of excess or waste materials, and other vestiges of construction prior to final acceptance of the work. The disturbed area shall be graded, filled and the entire area seeded unless otherwise indicated.

SECTION 01451

CONTRACTOR QUALITY CONTROL

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) Minimum Requirements for 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. 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 individual with the responsibility for the overall management of the project including quality 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 for the first 60 days of operation. Design and Construction will be permitted to begin

only after acceptance of the CQC Plan or acceptance of an interim plan applicable to the particular feature of work to be started. Work outside of the features of work included in an accepted interim plan will not be permitted to begin until acceptance of a CQC Plan or another interim plan containing the additional features of work to be started.

3.2.2 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. 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.

b. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function.

c. 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.

d. 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.

e. 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. (The Contracting Officer must approve Laboratory facilities.)

f. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation.

g. Procedures for tracking construction deficiencies from identification through acceptable corrective action. These procedures will establish verification that identified deficiencies have been corrected.

h. A list of the definable features of work. A definable feature of work is a task, which is separate and distinct from other tasks, has separate control requirements, and may be identified by different trades or disciplines, or it may 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 be agreed upon during the coordination meeting.

i. A list of tests to be performed shall be furnished as a part of the CQC Plan. The list shall give the test name, frequency, specification paragraph containing the test requirement, the personnel and laboratory responsible for each type of test, and an estimate of the number of tests required.

j. Design Quality Control (DQC) Plan

The Contractor's DQC Plan shall provide and maintain an effective quality control program, which will

assure that all services required by this design-build contract are performed and provided in a manner that meets professional architectural and engineering quality standards. As a minimum, all 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). In addition, the DQC Plan shall incorporate the Lessons Learned Databases provided by the Government. The Contractor shall correct errors and deficiencies in the design documents prior to submitting them to the Government.

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 reflects 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. The Contractor shall include in the DQC Plan the discipline-specific checklists to be used during the design and quality control of each submittal. These completed checklists shall be submitted at each design phase as part of the project documentation. Example checklists can be found in ER 1110-1-12.

The DQC Plan 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, and shall be cognizant of and assure that all documents on the project have been coordinated. This individual shall be a person who has verifiable engineering or architectural design experience and is a registered professional engineer or architect. The Contractor shall notify the Contracting Officer, in writing, of the name of the individual and the name of an alternate person assigned to the position.

The Contracting Officer will notify the Contractor, in writing, of the acceptance of the DQC Plan. After acceptance, any changes proposed by the Contractor are subject to the acceptance of the Contracting Officer.

3.2.3 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.

3.2.4 Notification of Changes

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 10 calendar days prior to the Coordination Meeting. 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 Personnel Requirements

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. Minimum number of full time on-site quality control personnel for this project is two. The Contractor shall provide a CQC organization, which shall be at the site at all times during progress of the construction work and who 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 the on site work organization 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, with a minimum of 5 years construction experience on construction similar to this contract. This CQC System Manager shall be on the site at all times during construction activities and shall be employed by the prime Contractor. The CQC System Manager shall be assigned no other duties. 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 Manager.

3.4.4 Additional Requirement

In addition to the above experience and education requirements, the CQC System Manager shall have completed the course entitled, "Construction Quality Management for Contractors". Specific times and locations for this training are available from the Contracting Officer.

3.4.5 Organizational Changes

The Contractor shall obtain Contracting Officer's acceptance before replacing any member of the CQC staff. Requests shall include the names, qualifications, duties, and responsibilities of each proposed replacement. Upon acceptance of any changes, the Contractor shall revise the CQC plan to accurately reflect the changes. The CQC plan shall be kept current at all times during the life of the contract.

3.5 SUBMITTALS AND DELIVERABLES

Materials submittals, as necessary, shall be made as specified in Section 01330 - SUBMITTAL PROCEDURES. Design submittals shall be made as required in Section 01012 - DESIGN AFTER AWARD. The CQC organization shall be responsible for certifying that all submittals are in compliance with the contract requirements.

3.6 CONTROL

Contractor Quality Control is the means by which the Contractor ensures that the design and construction, to include work of the designer of record, consultants, subcontractors and suppliers, complies with the requirements of the contract. The CQC System Manager for each definable features of work shall conduct at least three phases of control 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 work site. This phase 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.
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. 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 instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

3.6.2 Initial Phase

This phase shall be accomplished at the beginning of a definable feature of work. The following shall be accomplished:

a. A check of work 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 24 hours in advance of beginning the initial phase. Separate minutes of this phase shall be prepared by the CQC System Manager and attached to the daily CQC report. Exact location of initial phase shall be indicated for future reference and comparison with follow-up phases.
g. The initial phase should be repeated for each new crew to work on site, or any time acceptable specified quality standards are not being met.

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.

3.7 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 Corps of Engineers approved testing laboratory or establish an approved testing laboratory at the project site. 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, shall 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 offsite 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 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, and steel shall meet criteria detailed in ASTM D 3740 and ASTM E 329.

3.7.2.2 Capability Recheck

If the selected laboratory fails the capability check, the Contractor will be assessed a charge of $1,000.00 to reimburse the Government for each succeeding recheck of the laboratory or the checking of a subsequently selected laboratory. Such costs will be deducted from the contract amount due the Contractor.

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.

3.8 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 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 a 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, and 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. 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 contract. The original and one copy of these records in report form shall be furnished to the Government daily within 24 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.

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.

3.9.2

The Contractor shall establish and maintain, a daily formal deficiency tracking log that shall be kept at the job site. The log shall include the following:

a. Contract title and number.
b. Date reported.
c. Reported by.
d. Deficient work (By an identification number).
e. Type of Deficiency (Construction = C, Safety = A)
f. Description of corrective actions.
g. Date corrected.
h. Verified by.

3.9.3 Implementation of Government Resident Management System (RMS)

The Contractor shall utilize the government furnished computer program, Resident Management System (RMS), for generating the Contractor's Daily Quality Control Reports and in submitting other project information as described below. Government personnel from the administering office will load the program onto a computer designated by the Contractor and will also provide the basic funding/bid item data for the project. Government personnel will be available to conduct an on-site informal

training session of up to 8 hours on the setup and use of this system. The minimum system requirements to run the program are:

PC – IBM compatible (486 or better)
16 MB of RAM
30 MB of free hard disk space
3.5" high-density floppy drive
HP LaserJet Series III or later printer
MS-DOS version 5.0 or higher – RMS will run under Windows

The Contractor shall use the program to enter the following: Prime Contractor staffing and subcontractor data; definable features of work (items requiring a preparatory inspection) and pay activities to include Activity ID number, value, duration, start and finish dates, with subcontractor and bid item reference for each; required Quality Control Tests, planned User Schooling and Installed property, each tied to specific paragraphs and activities; submittal information to include specification section, description, expected days required for procurement and days of float for material need by dates, all of which shall be tied to the appropriate activity; and the system will be used to prepare proposed cumulative progress earnings. The sum of all activity values shall equal the contract amount, and all bid items shall be separately identified in accordance with the bid schedule and total the contract amount. This information shall be entered into the program and submitted to the administering office on high-density 3.5" diskette (s) under the MD-DOS version 5.0 or higher operating system. This information shall be updated as required and submitted to the administering office on a monthly basis or otherwise required.

During the course of the contract, the Contractor will receive from the government various Quality Assurance comments, which reflect existing deficiencies – items needing the attention of the Contractor. The Contractor shall acknowledge receipt of these comments/deficiencies by specific number reference (QA #) on the daily CQC Report and shall record in RMS any corrective action taken.

The Contractor Quality Control Module of RMS offers the contractor the ability to produce payment applications, record and print daily QC logs, monitor and track essential quality control activities and track submittals. The contractor can also generate the transmittal form for submittals with RMS.

3.10 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.

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SECTION 01500
TEMPORARY CONSTRUCTION FACILITIES

1 GENERAL

1.1 GENERAL REQUIREMENTS

1.1.1 Site Plan

The Contractor shall prepare a site plan indicating the proposed location and dimensions of any area to be fenced and used by the Contractor, the number of trailers to be used, entrance(s), utilities, and details of the fence installation. Any areas, which may have to be graveled to prevent the tracking of mud, shall also be identified. The Contractor shall also indicate any supplemental or other staging area.

1.1.2 Identification of Employees

The Contractor shall be responsible for furnishing to each employee and for requiring each employee engaged on the work to display identification as approved and directed by the Contracting Officer. Prescribed identification shall immediately be delivered to the Contracting Officer for cancellation upon release of any employee. When required, the Contractor shall obtain and provide fingerprints of persons employed on the project. Contractor and subcontractor personnel shall wear identifying markings on hard hats clearly identifying the company for whom the employee works.

1.1.3 Employee Parking

Contractor employees shall park privately owned vehicles in an area designated by the Contracting Officer. This area will be within reasonable walking distance of the construction site. Contractor employee parking shall not interfere with existing and established parking requirements of the facility.

1.2 SUBMITTALS (NOT APPLICABLE)

1.3 AVAILABILITY AND USE OF UTILITY SERVICES

1.3.1 Payment for Utility Services

The Government will make all reasonably required utilities available to the Contractor from existing outlets and supplies, as specified in the contract. Unless otherwise provided in the contract, the amount of each utility service consumed shall be charged to or paid for by the Contractor at prevailing rates charged to the Government or, where the utility is produced by the Government, at reasonable rates determined by the Contracting Officer. The Contractor shall carefully conserve any utilities furnished without charge.

1.3.2 Meters and Temporary Connections

The Contractor, at its expense and in a workmanlike manner satisfactory to the Contracting Officer, shall provide and maintain all necessary temporary connections, distribution lines, and meter assembly required to provide temporary electrical service.

1.3.3 Advance Deposit

An advance deposit to Fort Lee or utilities consisting of an estimated month's usage or a minimum of $50.00 will be required. The last monthly bills for the Federal fiscal year (01 Oct through 30 Sep of the

following year) will normally be offset by the deposit and adjustments will be billed or returned as appropriate. Services to be rendered for the next Federal fiscal year, beginning 1 October, will require a new deposit. Notification of the due date for this deposit will be mailed to the Contractor prior to the end of the current Federal fiscal year.

1.3.4 Final Meter Reading

Before completion of the project work and final acceptance of the work by the Government, the Government shall take a final meter reading and notify the Contractor of the final amount due, if any. . The Contractor shall then remove all the temporary distribution lines, meter base(s), and associated paraphernalia, and restore all disturbed areas to original condition or better prior to final acceptance of the work by the Government. The Contractor shall pay all outstanding utility bills before final acceptance of the work by the Government.

1.3.5 Sanitation

The Contractor shall provide and maintain within the construction area minimum field-type sanitary facilities approved by the Contracting Officer. Government toilet facilities will not be available to Contractor's personnel.

1.3.6 Telephone

The Contractor shall make arrangements and pay all costs for telephone facilities desired.

1.4 BULLETIN BOARD, PROJECT SIGN, AND PROJECT SAFETY SIGN

1.4.1 Bulletin Board

Within fifteen days after receipt of the Notice To Proceed, the Contractor shall provide a weatherproof bulletin board not less than 36 by 48 inches in size for displaying the Equal Employment Opportunity poster, a copy of the wage decision contained in the contract documents, Wage Rate Information poster, and other information required or approved by the Contracting Officer. The bulletin board shall be located at the project site in a conspicuous place, easily accessible to all employees, as approved by the Contracting Officer. Legible copies of the aforementioned data shall be displayed until work under this contract is completed. Upon completion of work the bulletin board shall be removed by and remain the property of the Contractor.

1.4.2 Project and Safety Signs

The requirements for the signs, there content, and location shall be provided at a location designated by the Contracting Officer. The signs shall be erected within 15 days after receipt of the Notice to Proceed. The data required by the safety sign shall be corrected daily, with light colored metallic or non-metallic numerals. Upon completion of the project, the signs shall be removed and disposed of by the Contractor.

1.4.2.1 Project Sign:

The project sign shall conform to the requirements as indicated on sign graphic, attached hereto.

1.4.2.2 Safety Sign:

The safety sign shall conform to the requirements as indicated on sign graphic, attached hereto. The data required by the sign shall be corrected daily, with light colored metallic or non-metallic numerals. Numerals, including mounting hardware, shall be subject to the approval of the CO.

1.4.2.3 Payment:

No separate payment will be made for the sign work covered under this section of the specifications and all costs in connection therewith will be considered as a subsidiary obligation of the Contractor, covered by the contract prices in this contract.

1.5 PROTECTION AND MAINTENANCE OF TRAFFIC

During construction the Contractor shall provide access and temporary relocated roads as necessary to maintain traffic. The Contractor shall maintain and protect traffic on all affected roads during the construction period except as otherwise specifically directed by the Contracting Officer. Measures for the protection and diversion of traffic, including the provision of watchmen and flag men, erection of barricades, placing of lights around and in front of equipment and the work, and the erection and maintenance of adequate warning, danger, and direction signs, shall be as required by the State and local authorities having jurisdiction. The traveling public shall be protected from damage to person and property. The Contractor's traffic on roads selected for hauling material to and from the site shall interfere as little as possible with public traffic. The Contractor shall investigate the adequacy of existing roads and the allowable load limit on these roads. The Contractor shall be responsible for the repair of any damage to roads caused by construction operations.

1.5.1 Barricades

The Contractor shall erect and maintain temporary barricades to limit public access to hazardous areas. Such barricades shall be required whenever safe public access to paved areas such as roads, parking areas or sidewalks is prevented by construction activities or as otherwise necessary to ensure the safety of both pedestrian and vehicular traffic. Barricades shall be securely placed, clearly visible with adequate illumination to provide sufficient visual warning of the hazard during both day and night. Barricades and other physical protection shall be in accordance with EM 385-1-1.

1.5.2 Haul Roads

The Contractor will be required to use the haul routes shown on the plans unless otherwise permitted in writing by the Contracting Officer. When haul routes are not designated on the plans, the Contractor must obtain approval of the Contracting Officer of haul routes he intends to use. The Contractor shall maintain the haul routes and shall keep the dust problem under control by wetting the surface as needed. Sweeping and cleaning of pavements will be done as necessary to remove spillage resulting from the hauling operations. After all hauling has been completed the Contractor shall restore the earth areas used for the haul routes to original condition by final grading, shaping, compacting, and grassing, and shall clean and sweep all paved areas as required. Any pavement damaged as a result of hauling operations under this contract for both the earth and other materials shall be promptly repaired by the Contractor, as approved by the Contracting Officer. The cost of maintenance and repair of the haul routes, as mentioned above, shall be considered as a subsidiary obligation of the Contractor. The axle load of earth hauling equipment operating on paved streets shall not exceed 12,000 pounds.

1.6 CONTRACTOR'S TEMPORARY FACILITIES

1.6.1 Administrative Field Offices and Storage Areas

The Contracting Officer will designate an area within which the Contractor shall be permitted to place administrative or storage trailers for equipment and limited construction materials other than in trailers. The Contractor shall provide and maintain administrative field office facilities within the construction area at the designated site. Government office and warehouse facilities will not be available to the Contractor's personnel.

1.6.1.1 Storage Area(s):

The Contractor shall construct a temporary 6-foot high chain link fence with privacy slats around all trailers and materials. Fence posts may be driven in lieu of concrete bases where soil conditions permit. No trailers, materials, or equipment shall be placed or stored outside the fenced area unless such trailers, materials or equipment are assigned a separate and distinct storage area by the CO away from the vicinity of the construction site but within the boundaries of the Post. At no time shall trailers, equipment or materials be open to public view with the exception of those items, which are in support of ongoing work on any given day. Materials shall not be stockpiled outside the fence in preparation for the next day's work. At the end of each workday, mobile equipment such as tractors, wheeled lifting equipment, cranes, trucks and like equipment shall be parked within the fenced area.

1.6.1.2 Supplemental Storage Area(s):

Upon request of the Contractor, the CO will designate another or supplemental area for the Contractor's use and storage of trailers, equipment and materials. This area may not be in close proximity to the construction site, but shall be within the boundaries of the Post. Fencing of materials or equipment will be required at this site; however, the Contractor shall be responsible for cleanliness and orderliness of the storage area used. The Contractor shall be responsible for the security of any materials or equipment stored in this area. The Government will provide no utilities to this area.

1.6.1.3 Appearance of Trailers:

Trailers utilized by the Contractor, whether for the purpose of administrative use or materials storage, shall present a clean and neat exterior appearance and be in a state of good repair. Trailers, which, in the opinion of the CO, are not in good repair, shall not be allowed on the Post.

1.6.1.4 Equipment:

Any item of construction equipment, with the exception of hand tools, which becomes inoperable shall be repaired within five (5) working days or removed from the construction site.

1.6.1.5 Maintenance of Storage Area(s):

It shall be the responsibility of the Contractor to keep all fencing in a state of good repair and proper alignment. Should the Contractor elect to traverse grassed or other areas without paving that are not established roadways, with construction equipment or other vehicles, such grassed or other areas shall be covered with a layer of gravel as necessary to prevent rutting and to prevent the tracking of mud onto paved or established roadways. Gradation of the gravel shall be at the discretion of the Contractor. The Contractor shall be responsible for the cutting of grass located within the boundaries of the construction site for the duration of the project. Grass and vegetation along fences, buildings, under trailers and in areas not accessible to mowers shall be edged or trimmed neatly.

1.6.1.6 Sanitation:

It shall be the responsibility of the Contractor to provide and maintain minimum field-type sanitary facilities, approved by the CO, within the construction area. Present Government toilet facilities will not be available to the Contractor's personnel.

1.6.2 Security Provisions

Adequate outside security lighting shall be provided at the Contractor’s temporary facilities. The Contractor shall be responsible for the security of its own equipment; in addition, the Contractor shall notify the appropriate law enforcement agency requesting periodic security checks of the temporary project field office.

1.7 CLEANUP

Construction debris, waste materials, packaging material and the like shall be removed from the work site daily. Any dirt or mud, which is tracked onto paved or surfaced roadways, shall be cleaned away. Materials resulting from demolition activities, which are salvageable, shall be stored within the fenced area described above or at the supplemental storage area. Stored material not in trailers, whether new or salvaged, shall be neatly stacked when stored.

1.8 RESTORATION OF STORAGE AREA

Upon completion of the project and after removal of trailers, materials, and equipment from within the fenced area, the fence shall be removed and will become the property of the Contractor. Areas used by the Contractor for the storage of equipment or material, or other use, shall be restored to the original or better condition. Gravel used to traverse grassed areas shall be removed and the area restored to its original condition, including topsoil and seeding as necessary.

2 PRODUCTS (NOT APPLICABLE)

3 EXECUTION (NOT APPLICABLE)

SECTION 01525
SAFETY REQUIREMENTS
12/01

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 the basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI A10.14(1991) Construction and Demolition Operations - Requirements for Safety Belts, Harnesses, Lanyards and Lifelines for Construction and Demolition Use

ANSI Z359.1(1992) Safety Requirements for Personal Fall Arrest Systems

ASME INTERNATIONAL (ASME)

ASME B30.5(1994) Mobile Cranes

ASME B30.22(1993) Articulating Boom Cranes

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910.94Ventilation

29 CFR 1910.120Hazardous Waste Operations and Emergency Response

29 CFR 1926.65Hazardous Waste Operations and Emergency Response

29 CFR 1926.502(f)Warning Line Systems

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1(1996) Safety and Health Requirements Manual

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 10(1995) Portable Fire Extinguishers

NFPA 70(1999) National Electrical Code

NFPA 241(1996) Safeguarding Construction, Alteration, and Demolition Operations

1.2 DEFINITIONS

a. Certified Industrial Hygienist. An industrial hygienist is an individual who is certified by the American Board of Industrial Hygiene.

b. Certified Safety Professional. A safety manager, safety specialist, or safety engineer that has passed the CSP exam administered by the Board of Certified Safety Professionals.

c. Competent Person. A competent person is one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

d. Confined Space. A space which by design has limited openings for entry and exit, unfavorable natural ventilation which could contain or produce dangerous air contaminants, and which is not intended for continuous employee occupancy. Confined spaces include, but are not limited to storage tanks, process vessels, pits, silos, vats, degreasers, reaction vessels, boilers, ventilation and exhaust ducts, sewers, tunnels, underground utility vaults, and pipelines.

e. First Aid. First aid is any one-time treatment, and any follow-up visit for the purpose of observation, of minor scratches, cuts, burns, splinters, and so forth, which do not ordinarily require medical care, even though provided by a physician or registered professional personnel.

f. Health and Safety Plan (HASP). The HASP is the Navy equivalent Army term of SHP or SSHP used in EM 385-1-1. "USACE" property and equipment specified in EM 385-1-1 should be interpreted as Government property and equipment.

g. Lost Workdays. The number of days (consecutive or not) after, but not including, the day of injury or illness during which the employee would have worked but could not do so; that is, could not perform all or part of his normal assignment during all or any part of the workday or shift; because of the occupational injury or illness.

h. Medical Treatment. Medical treatment includes treatment administered by a physician or by registered professional personnel under the standing orders of a physician. Medical treatment does not include first aid treatment even through provided by a physician or registered personnel.

i. Multi-employer work site (MEWS). A multi-employer work site, as defined by OSHA, is one in which many employers occupy the same site. The Navy considers the prime contractor to be the "controlling authority" for all work site safety and health of the subcontractors.

j. Operating Envelope. There is an "operating envelope" around any crane, and inside the envelope are the operator, riggers, rigging gear between the hook and the load, the load and the crane's supporting structure (ground, rail, etc.).

k. Qualified Person. One who, by possession of a recognized degree, certificate, or professional standing, or extensive knowledge, training, and experience, has successfully demonstrated his or her ability to solve or resolve problems related to the subject matter, the work or the project.

l. Recordable Occupational Injuries or Illnesses. Any occupational injuries or illnesses which result in:

(1) Fatalities, regardless of the time between the injury and death, or the length of the illness; or

(2) Lost Workday Cases, other than fatalities, that result in lost workdays, or

(3) Non-Fatal Cases without lost workdays which result in transfer to another job or termination of employment, or require medical treatment (other than first aid) or involve: loss of consciousness or restriction of work or motion. This category also includes any diagnosed occupational illnesses which are reported to the employer but are not classified as facilities or lost workday cases.

m. Safety Officer. The superintendent or other qualified or competent person who is responsible for the on-site safety required for the project. The contractor quality control person cannot be the safety officer, even through the QC has safety inspection responsibilities as part of the QC duties.

n. Serious Accidents. Any work-related incident, which results in, a fatality, in-patient hospitalization of three or more employees, or property damage in excess of $200,000.

o. Significant Accident. Any contractor accident which involves falls of 1.2 m (4 feet) or more, electrical accidents, confined space accidents, diving accidents, equipment accidents, crane accident or fire accidents, which, result in property damage of $10,000 or more, but less than $200,000; or when fire department or emergency medical treatment (EMT) assistance is required.

p. Weight Handling Equipment (WHE) Accident. A WHE accident occurs when any one or more of the six elements in the operating envelope fails to perform correctly during operation, including operation during maintenance or testing resulting in personnel injury or death; material or equipment damage; dropped load; derailment; two-blocking; overload; and collision, including unplanned contact between the load, crane, and/or other objects. A dropped load, derailment, two-blocking, overload and collision are considered accidents even though no material damage or injury occurs. A component failure (e.g., motor burnout, gear tooth failure, bearing failure) is not considered an accident solely due to material or equipment damage unless the component failure results in damage to other components (e.g., dropped boom, dropped load, roll over, etc.).

1.3 SUBMITTALS

Submit the following in accordance with Section 01330, "Submittal Procedures."

SD-07 Certificates

Accident Prevention Plan (APP); G

Activity Hazard Analysis (AHA); G

SD-11 Closeout Submittals

Daily Confined Space Entry Permit

Submit one copy of each permit attached to each Daily Production Report.

Reports

Submit reports as their incidence occurs, in accordance with the requirements of the paragraph entitled, "Reports."

Crane Reports

Crane Critical Lift Plan

Certificate of Compliance

1.4 QUALITY ASSURANCE

1.4.1 Qualifications

a. Qualifications of Safety Officer:

(1) Ability to manage the on-site contractor safety program through appropriate management controls.

(2) Ability to identify hazards and have the capability to expend resources necessary to abate the hazards.

(3) Must have worked on similar types of projects that are equal to or exceed the scope of the project assigned with the same responsibilities.

(4) Shall, as a minimum, have attended an OSHA training qualification class including at least 10 hours of classroom instruction.

b. Qualifications of Qualified Person, Confined Space Entry. The qualified person shall be capable (by education and specialized training) of anticipating, recognizing, and evaluating employee exposure to hazardous substances or other unsafe conditions in a confined space. This person shall be capable of specifying necessary control and protective action to ensure worker safety.

c. Qualification of Crane Operators. Crane operators shall meet the requirements in EM 385-1-1, Appendix G.

1.4.2 Not Used

1.4.3 Meetings

1.4.3.1 Preconstruction Conference

The safety officer shall attend the preconstruction conference.

1.4.3.2 Meeting on Work Procedures

a. Meet with Contracting Officer to discuss work procedures and safety precautions required by the APP. Ensure the participation of the contractor's superintendent, the quality control, and the CSP or CIH.

1.4.3.3 Weekly Safety Meetings

Hold weekly at the project site. Attach minutes showing contract title, signatures of attendees and a list of topics discussed to the QC Contractor Quality Control daily report.

1.4.3.4 Work Phase Meetings

The appropriate AHA shall be reviewed and attendance documented by the Contractor at the preparatory, initial, and follow-up phases of quality control inspection.

1.4.3.5 New Employee Indoctrination

New employees will be informed of specific site hazards before they begin work. Documentation of this orientation shall be kept on file at the project site.

1.4.4 Certifications

1.4.4.1 Accident Prevention Plan (APP)

Submit the APP at least 15 calendar days prior to start of work at the job site, following Appendix A of EM 385-1-1. Make the APP site specific. Notice To Proceed will be given after Government finds the APP acceptable.

1.4.4.2 Activity Hazard Analysis (AHA)

Submit the AHA for review at least 15 calendar days prior to the start of each phase. Format subsequent AHA as amendments to the APP. In accordance with contract quality control requirements each AHA will be reviewed during an on-site preparatory inspection.

1.4.5 Reports

1.4.5.1 Crane Reports

Submit crane inspection reports required in accordance with EM 385-1-1 and as specified herein with Daily Reports of Inspections.

1.4.5.2 Crane Critical Lift Plan

Submit crane critical lift plan EM 385-1-1 section 16 when crane loads meet or exceed 75 percent of the crane load capacity in any configuration.

1.4.5.3 Certificate of Compliance

The Contractor shall provide a Certificate of Compliance for each crane entering a Naval activity under this contract (see Contracting Officer for a blank certificate). Certificate shall state that the crane and rigging gear meet applicable OSHA regulations (with the contractor citing which OSHA regulations are applicable, e.g., cranes used in construction, demolition, or maintenance shall comply with 29 CFR 1926. Certify on the Certificate of Compliance that the crane operator(s) is qualified and trained in the operation of the crane to be used. The Contractor shall also certify that all of its crane operators working on the ARMY activity have been trained not to bypass safety device (e.g., anti-two block devices) during lifting operations. These certifications shall be posted on the crane.

1.5 ACCIDENT PREVENTION PLAN (APP)

Prepare the APP in accordance with the required and advisory provisions of EM 385-1-1 including Appendix A, "Minimum Basic Outline for Preparation of Accident Prevention Plan," and as modified herein. Include the associated AHA and other specific plans, programs and procedures listed on Pages A-3 and A-4 of EM 385-1-1, some of which are listed below.

1.5.1 Contents of the Accident Prevention Plan

a. Name and safety related qualifications of safety officer (including training and any certifications).

b. Qualifications of competent and of qualified persons.

c. Identity of the individual who will complete exposure data (hours worked); accident investigations, reports and logs; and immediate notification of accidents to include subcontractors.

d. Emergency response plan. Conform to EM 385-1-1, paragraph 01.E and include a map denoting the route to the nearest emergency care facility with emergency phone numbers. Contractor may be required to demonstrate emergency response.

e. Confined Space Entry Plan. Identify the qualified person's name and qualifications, training, and experience. Delineate the qualified person's authority to direct work stoppage in the event of hazardous conditions. Include procedure for rescue by contractor personnel and the coordination with emergency responders. (If there is no confined space work, include a statement that no confined space work exists and none will be created.)

f. Hazardous Energy Control Plan. For hazardous energy sources, comply with EM 385-1-1, paragraph 12.A.07.

g. Alcohol and Drug Abuse Plan

(1) Describe plan for random checks and testing with pre-employment screening in accordance with the DFAR Clause subpart 252.223-7004, "Drug Free Work Force."

(2) Description of the on-site prevention program

h. Fall Protection and Prevention (FP&P) Plan. The plan shall be site specific and address all fall hazards in the work place. It shall address how to protect and prevent workers from falling to lower levels when they are exposed to fall hazards above 1.8 m 6 feet. A qualified person shall prepare the plan. The plan shall include fall protection and prevention systems, equipment and methods employed, responsibilities, rescue and escape equipment and operations, training requirements, and monitoring methods. FP&P Plan shall be revised [once every six months] for lengthy projects, to reflect any new changes during the course of construction, due to changes of personnel, equipment, systems or work habits.

i. Silica Exposure Reduction. The plan shall include specific procedures to prevent employee silica inhalation exposures.

j. Site Demolition Plan. The safety and health aspects prepared in accordance with Section 02220N, "Site Demolition" and referenced sources.

k. Excavation Plan. The safety and health aspects prepared in accordance with Section 02302N, "Excavation, Backfilling, and Compacting for Utilities".

p. Training Records and Requirements. List of mandatory training and certifications which are applicable to this project (e.g. explosive actuated tools, confined space entry, fall protection, crane operation, vehicle operator, forklift operators, personal protective equipment); list of requirements for periodic retraining/certification; outline requirements for supervisory and employee safety meetings.

q. Severe Weather Plan. Procedures of ceasing on-site operations during lightning or upon reaching maximum allowed wind velocities.

r. Emergency Lighting and Power Systems Plan (e.g. periodic testing of batteries for emergency lighting.)

1.5.2 Hazardous Material Use

Each hazardous material must receive approval prior to bringing onto the job site or prior to any other use in connection with this contract. Allow a minimum of 10 working days for processing of the request for use of a hazardous material. Any work or storage involving hazardous chemicals or materials must be done in a manner that will not expose government employees to any unsafe or unhealthful conditions. Adequate protective measures must be taken to prevent government employees from being exposed to any hazardous condition that could result from the work or storage. Approval by the Contracting Officer of protective measures and storage area is required prior to the start of the work.

1.6 ACTIVITY HAZARD ANALYSIS (AHA)

Prepare for each phase of the work. As a minimum, define activity being performed, sequence of work, specific hazards anticipated, control measures to eliminate or reduce each hazard to acceptable levels, training requirements for all involved, and the competent person in charge of that phase of work. For work with fall hazards, including

fall hazards associated with scaffold erection and removal, identify the appropriate fall arrest systems. For work with materials handling equipment, address safeguarding measures related to materials handling equipment. For work requiring excavations, include excavation safeguarding requirements. The appropriate AHA shall be reviewed and attendance documented by the Contractor at the preparatory, initial, and follow-up phases of quality control inspection.

1.7 NOT USED

1.8 DRUG PREVENTION PROGRAM

Conduct a proactive drug and alcohol use prevention program for all workers, prime and subcontractor, on the site. Ensure that no employees either use illegal drugs or consume alcohol during work hours. Ensure there are no employees under the influence of drugs or alcohol during work hours. After accidents, collect blood, urine or saliva specimens and test injured employee's influence. A copy of the test shall be made available to the Contracting Officer upon request.

1.9 FALL HAZARD PROTECTION AND PREVENTION PROGRAM

1.9.1 Scaffolds

Delineate the fall protection requirements necessary during the erection and dismantling operation of scaffolds used on the project in the Fall Protection and Prevention (FP&P) plan and activity hazard analysis for the phase of work.

1.9.2 Training

Institute a fall protection training program. As part of the Fall Hazard Protection and Prevention Program, Contractor shall provide training for each employee who might be exposed to fall hazards.

1.10 DUTIES OF THE SAFETY OFFICER

a. Ensure construction hazards are identified and corrected.

b. Maintain applicable safety reference material on the job site.

c. Maintain a log of safety inspections performed.

d. Attend the pre-construction conference as required.

e. Identify hazardous conditions and take corrective action. Failure to do so will result in a dismissal from the site, with a work stoppage pending approval of suitable replacement personnel.

1.11 DISPLAY OF SAFETY INFORMATION

Display the following information in clear view of the on-site construction personnel:

a. Map denoting the route to the nearest emergency care facility with emergency phone numbers.

b. AHA

c. Confined space entry permit.

d. A sign indicating the number of hours worked since last lost workday accident.

1.12 SITE SAFETY REFERENCE MATERIALS

Maintain safety-related references applicable to the project, including those listed in the article "References." Maintain applicable equipment manufacturers' manuals.

1.13 NOT USED

1.14 EMERGENCY MEDICAL TREATMENT

Contractors will arrange for their own emergency medical treatment. Government has no responsibility to provide emergency medical treatment. However, if emergency medical care is rendered by Navy medical services, charges may be billed to Contractor at prevailing rates established in BUMED Instruction 6320.4 series. Reimbursement shall be made by Contractor to Naval Regional Medical Center Collection Agent upon receipt of monthly statement.

1.15 NOT USED

1.16 REPORTS

1.16.1 Accident Reports

a. For recordable occupational injuries and illnesses, the Prime Contractor shall conduct an accident investigation to establish the root cause(s) of the accident, complete the Navy Contractor Significant Incident Report (CSIR) form and provide to the Contracting Officer within 5 calendar days of the accident. The Contracting Officer will provide a copy of the CSIR form.

b. For a weight handling equipment accident the Prime Contractor shall conduct an accident investigation to establish the root cause(s) of the accident, complete the WHE Accident Report form and provide to the Contracting Officer within 30 calendar days of the accident. The Contracting Officer will provide a blank copy of the WHE accident report form.

1.16.2 Notification

Notify the Contracting Officer as soon as practical, but not later than four hours, of any accident meeting the definition of Recordable Occupational Injuries or Illnesses or Significant Accidents. Information shall include contractor name; contract title; type of contract; name of activity, installation or location where accident occurred; date and time of accident; names of personnel injured; extent of property damage, if any; and brief description of accident (to include type of construction equipment used, PPE used, etc.).

1.16.3 Monthly Exposure Report

Monthly exposure reporting, to the Contracting Officer is required to be attached to the monthly billing request. This report is a compilation of employee-hours worked each month for all site workers, both prime and subcontractor.

1.16.4 OSHA Citations and Violations

Provide the Contracting Officer with a copy of each OSHA citation, OSHA report and contractor response. Correct violations and citations promptly and provide written corrective actions to the Contracting Officer.

1.16.5 Crane Notification

Notify Contracting Officer at least 15 days prior to bringing any crane equipment on-site so that the contracting officer may arrange for any additional quality assurance spot checks necessary by the government.

PART 2 PRODUCTS

2.1 FALL PROTECTION ANCHORAGE

Fall protection anchorage, conforming to ANSI Z359.1, will be left in place and so identified for continued customer use.

2.2 CONFINED SPACE SIGNAGE

Provide permanent signs integral to or securely attached to access covers for new permit required confined spaces. Signs wording: "DANGER--PERMIT REQUIRED CONFINED SPACE - DO NOT ENTER -" on bold letters a minimum of 25 mm one inch in height and constructed to be clearly legible with all paint removed. The signal word "DANGER" shall be red and readable from 1.52 m 5 feet.

PART 3 EXECUTION

3.1 CONSTRUCTION

Comply with EM 385-1-1, NFPA 241, the accident prevention plan, the activity hazard analysis and other related submittals and activity fire and safety regulations.

3.1.1 Hazardous Material Exclusions

Notwithstanding any other hazardous material used in this contract, radioactive materials or instruments capable of producing ionizing/non-ionizing radiation as well as materials which contain asbestos, mercury or polychlorinated biphenyls, di-isocynates, lead-based paint are prohibited. Exceptions to the use of any of the above excluded materials may be considered by Contracting Officer upon written request by Contractor.

3.1.2 Unforeseen Hazardous Material

The design should have identified materials such as PCB, lead paint, and friable and nonfriable asbestos. If material, not indicated, that may be hazardous to human health upon disturbance during construction operations is encountered, stop that portion of work and notify the Contracting Officer immediately. Within 14 calendar days the Government will determine if the material is hazardous. If material is not hazardous or poses no danger, the Government will direct the Contractor to proceed without change. If material is hazardous and handling of the material is necessary to accomplish the work, the Government will issue a modification pursuant to "FAR 52.243-4, Changes" and "FAR 52.236-2, Differing Site Conditions."

3.2 PRE-OUTAGE COORDINATION MEETING

Contractors are required to apply for utility outages a minimum of 15 days in advance. As a minimum, the request should include the location of the outage, utilities being effected, duration of outage and any necessary sketches. Special requirements for electrical outage requests are contained elsewhere in this specification section. Once approved and prior to beginning work on the utility system requiring shut down, the Contractor shall attend a pre-outage coordination meeting with the Contracting Officer and the Station Utilities Department to review the scope of work and the lock out/tag out procedures for worker protection. No work will be performed on energized electrical equipment unless proven impassable. Working equipment "hot" must be considered the last option.

3.3 PERSONNEL PROTECTION

3.3.1 Hazardous Noise

Provide hazardous noise signs, and hearing protection, wherever equipment and work procedures produce sound-pressure levels greater than 85 dBA steady state or 140 dBA impulse, regardless of the duration of the exposure.

3.3.2 Fall Protection

Enforce use of the fall protection device designated for each specific work activity in the FP&P plan and/or AHA all times when an employee is on a surface 1.8 m 6 feet or more above lower levels. Personal fall arrest systems are required when working from an articulating or extendible boom, scissor lifts, swing stages, or suspended platform. Fall protection must comply with ANSI A10.14.

3.3.2.1 Personal Fall Arrest Device

Personal fall arrest device equipment, systems, subsystems, and components shall meet ANSI Z359.1, "Safety Requirements for Personal Fall Arrest Systems". Only a full-body harness with a shock absorbing lanyard or self-retracting lanyard is an acceptable personal fall arrest device. Body belts may only be used as a positioning device system such as steel reinforcing assembly and in conjunction with another fall arrest system. Harnesses shall have a fall arrest attachment, which is a connector, affixed to the body support (usually a D-ring) and specifically designated for attachment to the rest of the

system. Only double locking snap hooks and carabiners shall be used. Webbing, straps, and ropes shall be made of synthetic fiber.

3.3.2.2 Fall Protection for Roofing Work

Fall protection controls shall be implemented based on the type of roof being constructed and work being performed. The roof area to be accessed shall be evaluated for its structural integrity including weight-bearing capabilities for the projected loading.

a. Low Sloped Roofs:

(1) For work within 1.8 m 6 feet of an edge, on low-slope roofs, personnel shall be protected from falling by use of personal fall arrest systems, guardrails, or safety nets. Safety monitoring system is not adequate fall protection and is not authorized.

(2) For work greater than 1.8 m 6 feet from an edge, warning lines shall be erected and installed in accordance with 29 CFR 1926.502(f).

b. Steep Roofs: Work on steep roofs requires personal fall arrest system, guardrails with toe-boards, or safety nets. This requirement also includes residential or housing type construction.

3.3.2.3 Safety Nets

If safety nets are used as the selected fall protection system on the project, they shall be provided at unguarded workplaces, over water, machinery, dangerous operations and leading edge work.

3.3.2.4 Existing Anchorage

Existing anchorages, used for attachment of personal fall arrest equipment, if to be used by the Contractor, shall be re-certified by the contractor's fall protection engineer (QP).

3.4 SCAFFOLDING

Employees shall be provided with a safe means of access to the work area on the scaffold. Climbing of any scaffold braces or supports not specifically designed for access is prohibited. Stair towers or ladders built into scaffold systems in accordance with USACE EM 385-1-1 Appendix J are required for work platforms greater than 6 m 20 feet in height. Contractor shall ensure that employees that are qualified perform scaffold erection. Do not use scaffold without the capability of supporting at least four times the maximum intended load or without appropriate fall protection as delineated in the accepted fall protection plan. Minimum platform size shall be based on the platform not being greater in height than three times the dimension of the smallest width dimension for rolling scaffold. Some Baker type scaffolding has been found not to meet these requirements. Stationary scaffolds must be attached to structural building components to safeguard against tipping forward or backward. Special care shall be given to ensure scaffold systems are not overloaded. Outrigger brackets used to extend scaffold platforms on self supported scaffold systems for the storage of material is prohibited. The first tie-in shall be at the height equal to 4 times the width of the smallest dimension of the scaffold base.

3.5 EQUIPMENT

3.5.1 Material Handling Equipment

a. Material handling equipment such as forklifts shall not be modified with work platform attachments for supporting employees unless specifically delineated in the manufacturer's printed operating instructions.

b. The use of hooks on equipment for lifting of material must be in accordance with manufacturers printed instructions.

3.5.2 Weight Handling Equipment

a. Cranes must be equipped with:

(1) Load Indicating Devices (LIDs) and a Boom Angle or Radius Indicator,

(2) or Load-Moment Indicating Devices (LMIs).

(3) Anti-two-block prevention devices.

(4) Boom Hoist Hydraulic Relief Valve, Disconnect, or Shutoff (stops hoist when boom reaches a predetermined high angle).

(5) Boom Length Indicator (for telescoping booms).

(6) Device to prevent uncontrolled lowering of a telescoping hydraulic boom.

(7) Device to prevent uncontrolled retraction of a telescoping hydraulic boom.

b. The Contractor shall notify the Contracting Officer, in advance, of any cranes entering the activity so that necessary quality assurance spot checks can be coordinated.

c. The Contractor shall comply with the crane manufacturer's specifications and limitations for erection and operation of cranes and hoists used in support of the work. Erection shall be performed under the supervision of a designated person (as defined in ASME B30.5). All testing shall be performed in accordance with the manufacturers recommended procedures.

d. The Contractor shall comply with ASME B30.5 for mobile cranes, and ASME B30.22 for articulating boom cranes.

e. The presence of Instilation safety and health inspectors does not relieve the Contractor of an obligation to comply with all applicable safety regulations. The Government will investigate all complaints of unsafe or unhealthful working conditions received in writing from contractor employees, federal civilian employees, or military personnel.

f. Each load shall be rigged/attached independently to the hook/master-link in such a fashion that the load cannot slide or otherwise become detached. Christmas-tree lifting (multiple rigged materials) is not allowed.

g. When operating in the vicinity of overhead transmission lines, operators and riggers shall be alert to this special hazard and shall follow the requirements of ASME B30.5 or ASME B30.22 as applicable.

h. Crane supported work platforms shall only be used in extreme conditions if the Contractor proves that using any other access to the work location would provide a greater hazard to the workers. Personnel shall not be lifted with a live hoist or friction crane.

i. A fire extinguisher having a minimum rating of 10BC and a minimum nominal capacity of 5lb of extinguishing agent shall be available at all operator stations or cabs of cranes. Portable fire extinguishers shall be inspected, maintained, and recharged as specified in NFPA 10, Standard for Portable Fire Extinguishers.

j. All employees shall be kept clear of loads about to be lifted and of suspended loads.

k. A weight handling equipment operator shall not leave his position at the controls while a load is suspended.

l. A Contractor Crane Operation Checklist shall be used by the CQC representative during oversight of contractor crane operations (refer to EM 385-1-1 Appendix H and Contracting Officer for copies).

m. Only contractor crane operators who have met the requirements of 29 CFR 1910.94, 29 CFR 1910.120, 29 CFR 1926.65, 29 CFR 1926.502(f), EM 385-1-1, ASME B30.5, and ASME B30.22 and other local and state requirements shall be authorized to operate the crane.

n. Cribbing shall be utilized by the Contractor when performing lifts on outriggers.

o. The crane hook/block must be positioned directly over the load. Side loading of the crane is prohibited.

p. A physical barricade must be positioned to prevent personnel from entering the tailswing area of the crane.

q. A substantial and durable rating chart containing legible letters and figures shall be provided with each crane and securely mounted onto the crane cab in a location allowing easy reading by the operator while seated in the control station.

r. Certification records which include the date of inspection, signature of the person performing the inspection along with the serial number or other identifier of the crane which was inspected. This record will always be available for review by contracting officer personnel.

s. Written reports listing the load test procedures utilized along with any repairs or alterations performed on the crane will be available for review by the contracting officer personnel.

t. Contractor shall certify that all of the crane operators have been trained not to bypass safety devices (e.g. anti-two block devices) during lifting operations.

3.6 Excavations

The competent person for excavation performed as a result of contract work shall be on-site when work is being performed in excavation, and shall inspect excavations prior to entry by workers. The competent person must evaluate for all hazards, including atmospheric, that may be associated with the work, and shall have the resources necessary to correct hazards promptly. Prior to digging the appropriate digging permit must be obtained. All underground utilities in the work area must be positively identified by a utility locating service and coordinated with Station Utility Departments. The Contractor must physically verify underground utility locations by hand digging using wood or fiberglass handled tools when any adjacent construction work is expected to come within three feet of the underground system. If construction is parallel to an existing utility the utility shall be exposed by hand digging every 30 m (100 feet) if parallel within 1500 m 5 feet of the excavation. Trench and shoring systems must be identified in the accepted safety plan and activity hazard analysis. Extreme care must be used when excavating near direct burial electric underground cables. Trenching machines with digging chain drives shall be operated only when the spotters/laborers are in plain view of the operator. Operator and spotters/laborers shall be provided training on the hazards of the digging chain drives with emphasis on the distance that needs to be maintained when the digging chain is operating. Documentation of the training shall be kept on file in the project site office or trailer.

3.7 ELECTRICAL

3.7.1 Conduct of Electrical Work

Underground electrical spaces must be certified safe for entry before entering to conduct work. Cable intended to be cut must be positively identified and de-energized prior to performing each cut. Positive cable identification must be made prior to submitting any outage request for electrical systems. Arrangements are to be coordinated with the Contracting Officer and Station Utilities for identification. The Contracting Officer will not accept an outage request until the Contractor satisfactorily documents that the circuits have been clearly identified.Perform all high voltage cutting remotely. When racking in or live switching of circuit breakers, no additional person other than the switch operator will be allowed in the space during the actual operation. Plan so that work near energized parts is minimized to the fullest extent possible. Use of electrical outages clear of any energized electrical sources is the preferred method. When working in energized substations, only qualified electrical workers shall be permitted to enter. When work requires Contractor to work near energized circuits as defined by the NFPA 70, high voltage personnel must use personal protective equipment that includes, as a minimum, electrical hard hat, safety shoes, insulating gloves with leather protective sleeves, fire retarding shirts, coveralls, face shields, and safety glasses. Insulating blankets, hearing protection, and switching suits may be required, depending on the specific job and as delineated in the Contractor AHA.

3.7.2 Portable Extension Cords

Portable extension cords shall be sized in accordance with manufacturer ratings for the tool to be powered.

3.8 WORK IN CONFINED SPACES

Comply with the requirements in Section 06.I of EM 385-1-1. Any potential for a hazard in the confined space requires a permit system to be used.

a. Entry Procedures. Prohibit entry into a confined space by personnel for any purpose, including hot work, until the qualified person has conducted appropriate tests to ensure the confined or enclosed space is safe for the work intended and that all potential hazards are controlled or eliminated and documented. (See Section 06.I.05 of EM 385-1-1 for entry procedures.) All hazards pertaining to the space shall be reviewed with each employee during review of the AHA.

b. Forced air ventilation is required for all confined space entry operations and the minimum air exchange requirements must be maintained.

c. Ensure the use of rescue and retrieval devices in confined spaces greater than 1.5 m 5 feet in depth. Conform to Sections 06.I.09, 06.I.10 and 06.I.11 of EM 385-1-1.

d. Sewer wet wells require continuous atmosphere monitoring with audible alarm for toxic gas detection.

e. Include training information for employees who will be involved as entrant attendants for the work. Conform to Section 06.I.06 of EM 385-1-1.

f. Entry Permit. Use ENGFORM 5044-R or other form with the same minimum information for the Daily Confined Space Entry Permit, completed by the qualified person. Post the permit in a conspicuous place close to the confined space entrance.

3.9 CRYSTALLINE SILICA

Grinding, abrasive blasting, and foundry operations of construction materials containing crystalline silica, shall comply with OSHA regulations, such as 29 CFR 1910.94, and EM 385-1-1, (Appendix C). The Contractor shall develop and implement effective exposure control and elimination procedures to include dust control systems, engineering controls, and establishment of work area boundaries, as well as medical surveillance, training, air monitoring, and personal protective equipment.

3.10 HOUSEKEEPING

3.10.1 Clean-up

All debris in work areas shall be cleaned up daily or more frequently as necessary. Construction debris may be temporarily located in an approved location, however garbage accumulation must be removed each day.

3.10.2 Dust Control

In addition to the dust control measures required elsewhere in the contract documents dry cutting of brick or masonry shall be prohibited. Wet cutting must address control of water run off.

3.11 ACCIDENT SCENE PRESERVATION

For serious accidents, and accidents involving weight handling equipment, ensure the accident site is secured and evidence is protected remaining undisturbed until released by the Contracting Officer.

3.12 FIELD QUALITY CONTROL

3.12.1 Inspections

Include safety inspection as a part of the daily Quality Control inspections required in Section 01450N, "Quality Control".

3.13 FLAMMABLE AND COMBUSTIBLE LIQUID HANDLING AND STORAGE

3.13.1 Safety Gas Containers

Handling of flammable and combustible liquids shall be in safety containers with flame arresters, with not more than 19 L 5 gallons capacity, having a spring-closing lid and spout cover and designed to safely relieve internal pressures under fire exposures. Flammable and combustible Liquids shall be stored in separate NFPA approved storage cabinets 15 m 50 feet away from any sources of ignition with suitable NO SMOKING OR OPEN FLAME signs posted in all such areas.

SECTION 01780
CLOSEOUT SUBMITTALS

Includes Special Change (Submittal Paragraph)(June 2001)

1 GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals not having a "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-18 Records

As-Built Drawings; GA.

Drawings showing final as-built conditions of the project. The final CADD as-built drawings shall consist of one set of electronic CADD drawing files in the specified format, one set of mylar drawings, 2 sets of blue-line prints of the mylars, and one set of the approved working as-built drawings.

As-Built Record of Equipment and Materials; FIO.

Two copies of the record listing the as-built materials and equipment incorporated into the construction of the project.

Final Approved Shop Drawing; GA.

Two copies of the final approved as-built shop drawings as described below.

Construction Contract Specifications; FIO

Two copies of the as-built specifications as described below.

Real Property Equipment; FIO

Three copies of the draft and three copies of the final “Equipment in Place List” as described below.

Warranty Management Plan; GA.

Three sets of the warranty management plan containing information relevant to the warranty of materials and equipment incorporated into the construction project, including the starting date of warranty of construction. The Contractor shall furnish with each warranty the name, address, and telephone number of each of the guarantor's representatives nearest to the project location.

Warranty Tags; FIO.

Two record copies of the warranty tags showing the layout and design.

Final Clean-Up; FIO.

Two copies of the listing of completed final clean-up items.

1.2 PROJECT RECORD DOCUMENTS

1.2.1 As-Built Drawings

These paragraph covers as-built drawings complete, as a requirement of the contract. The terms "drawings," "contract drawings," "drawing files," "working as-built drawings" and "final as-built drawings" refer to contract drawings, which are revised to be used for final as-built drawings.

1.2.1.1 Government Furnished Materials

The Government will not furnish CADD files or mylars other than those provided in the Request for Proposal.

1.2.1.2 Working As-Built and Final As-Built Drawings

The Contractor shall revise 2 sets of paper drawings by redline process to show the as-built conditions during the prosecution of the project. These working as-built marked drawings shall be kept current on a weekly basis and at least one set shall be available on the job site at all times. 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 accurately and neatly recorded as they occur by means of details and notes. Final as-built drawings shall be prepared after the completion of each definable feature of work as listed in the Contractor Quality Control Plan (Foundations, Utilities, Structural Steel, etc., as appropriate for the project). The Contracting Officer and the Contractor prior to submission of each monthly pay estimate will jointly review the working as-built marked prints and final as-built drawings for accuracy and completeness. If the Contractor fails to maintain the working and final as-built drawings as specified herein, the Contracting Officer will deduct from the monthly progress payment an amount representing the estimated cost of maintaining the as-built drawings. This monthly deduction will continue until an agreement can be reached between the Contracting Officer and the Contractor regarding the accuracy and completeness of updated drawings. The working and final as-built drawings shall show, but shall not be limited to, the following information:

a. The actual location, kinds and sizes of all sub-surface utility lines. In order that the location of these lines and appurtenances may be determined in the event the surface openings or indicators become covered over or obscured, the as-built drawings shall show, by offset dimensions to two permanently fixed surface features, the end of each run including each change in direction. Valves, splice boxes and similar appurtenances shall be located by dimensioning along the utility run from a reference point. The average depth below the surface of each run shall also be recorded.

b. The location and dimensions of any changes within the building structure.

c. Correct grade, elevations, cross section, or alignment of roads, earthwork, structures or utilities if any changes were made from contract plans.

d. 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 fabrication, erection, installation plans and placing details, pipe sizes, insulation material, dimensions of equipment foundations, etc.

e. The topography, invert elevations and grades of drainage installed or affected as part of the project construction.

f. Changes or modifications, which result from the final inspection.

g. Where contract drawings or specifications present options, only the option selected for construction shall be shown on the final as-built prints.

h. If borrow material for this project is from sources on Government property, or if Government property is used as a spoil area, the Contractor shall furnish a contour map of the final borrow pit/spoil area elevations.

i. Systems designed or enhanced by the Contractor, such as HVAC controls, fire alarm, fire sprinkler, and irrigation systems.

j. Modifications (change order price shall include the Contractor's cost to change working and final as-built drawings to reflect modifications) and compliance with the following procedures.

(1) Directions in the modification for posting descriptive changes shall be followed.

(2) A Modification Circle shall be placed at the location of each deletion.

(3) For new details or sections, which are added to a drawing, a Modification Circle shall be placed by the detail or section title.

(4) For minor changes, a Modification Circle shall be placed by the area changed on the drawing (each location).

(5) For major changes to a drawing, a Modification Circle shall be placed by the title of the affected plan, section, or detail at each location.

(6) For changes to schedules or drawings, a Modification Circle shall be placed either by the schedule heading or by the change in the schedule.

(7) The Modification Circle size shall be 1/2-inch diameter unless the area where the circle is to be placed is crowded. Smaller size circle shall be used for crowded areas.

k. Final As-Built Drawings. When the as-built drawings are completed, and prior to submission to the Government, the Contractor shall indicate on each drawing, in the lower right hand corner, in bold letters at least 1¼"high, "As-BUILT DRAWING".

1.2.1.3 Drawing Preparation

The as-built drawings shall be modified as may be necessary to correctly show the features of the project as it has been constructed by bringing the contract set into agreement with approved working as-built prints, and adding such additional drawings as may be necessary. These working as-built marked prints shall be neat, legible and accurate. These drawings are part of the permanent records of this project and shall be returned to the Contracting Officer after approval by the Government. The Contractor at no expense to the Government shall satisfactorily replace any drawings damaged or lost by the Contractor.

1.2.1.4 Computer Aided Design and Drafting (CADD) Drawings

Only personnel proficient in the preparation of CADD drawings shall be employed to modify the contract drawings or prepare additional new drawings. Additions and corrections to the contract drawings shall be equal in quality and detail to that of the originals. Line colors, line weights, lettering, layering conventions, and symbols shall be the same as the original line colors, line weights, lettering, layering conventions, and symbols. If additional drawings are required, they shall be prepared using the specified electronic file format applying the same graphic standards specified for original drawings. The title block and drawing border to be used for any new final as-built drawings shall be identical to that used on the contract drawings. Additions and corrections to the contract drawings shall be accomplished using CADD files. The Contractor shall be responsible for providing all program files and hardware necessary to prepare final as-built drawings. The Contracting Officer will review final as-built

drawings for accuracy and the Contractor shall make required corrections, changes, additions, and deletions.

a. CADD colors shall follow the color scheme of the original drawing. Layer code for changes shall be as follows:

(1) Deletions Items - Deleted graphic items (lines) shall be colored red with red lettering in notes and leaders and moved to a layer named “DELETED ITEMS” and that layer shall be “frozen” from plotting.

(2) Added Items - Added items shall be drawn in colors to match the original drawing but shall be placed on a layer called “ITEMS ADDED BY CHANGE ORDER”.

(3) Special Items - Items requiring special information, coordination, or special detailing or detailing notes shall follow the drawing color scheme and be placed on a layer called “SPECIAL REQUIREMENTS”.

b. The Contract Drawing files shall be renamed in a manner related to the contract number (i.e., 98-C-10.DGN) as instructed in the Pre-Construction conference. Marked-up changes shall be made only to those renamed files. All changes shall be made on the layer/level as the original item. There shall be no deletions of existing lines; existing lines shall be changed to red and moved to the “DELETED ITEMS” layer.

c. When final revisions have been completed, the cover sheet drawing shall show the wording "RECORD DRAWING AS-BUILT" followed by the name of the Contractor in letters at least 1/4 inch high. All other contract drawings shall be marked either "AS-Built" drawing denoting no revisions on the sheet or "Revised As-Built" denoting one or more revisions. Original contract drawings shall be dated in the revision block. CADD documents shall be provided in AutoCAD format.

d. Within 10 days for contracts less than $5 million after Government approval of all of the working as-built drawings for a phase of work, the Contractor shall prepare the final CADD as-built drawings for that phase of work and submit two sets of blue-lined prints of these drawings for Government review and approval. The Government will promptly return one set of prints annotated with any necessary corrections. Within 7 days for contracts less than $5 million the Contractor shall revise the CADD files accordingly at no additional cost and submit one set of final prints for the completed phase of work to the Government. Within 10 days for contracts less than $5 million of substantial completion of all phases of work, the Contractor shall submit the final as-built drawing package for the entire project. The submittal shall consist of one set of electronic files on compact disc, read-only memory (CD-ROM), one set of mylars, two sets of blue-line prints and one set of the approved working as-built drawings. They shall be complete in all details and identical in form and function to the contract drawing files supplied by the Government. Any transactions or adjustments necessary to accomplish this are the responsibility of the Contractor. The Government reserves the right to reject any drawing files it deems incompatible with the customer's CADD system. Paper prints, drawing files and storage media submitted will become the property of the Government upon final approval. Failure to submit final as-built drawing files and marked prints as specified shall be cause for withholding any payment due the Contractor under this contract. Approval and acceptance of final as-built drawings shall be accomplished before final payment is made to the Contractor.

1.2.1.5 Payment

No separate payment will be made for as-built drawings required under this contract, and all costs accrued in connection with such drawings shall be considered a subsidiary obligation of the Contractor.

1.2.2 As-Built Record of Equipment and Materials

The Contractor shall furnish two copies of preliminary record of equipment and materials used on the project 15 days prior to final inspection. This preliminary submittal will be reviewed and returned 2 days after final inspection with Government comments. Two sets of final record of equipment and materials shall be submitted 10 days after final inspection. The designations shall be keyed to the related area depicted on the contract drawings. The record shall list the following data:

RECORD OF DESIGNATED EQUIPMENT AND MATERIALS DATA

Description	Specification Section	Manufacturer and Catalog, Model, and Serial Number	Composition and Size	Where Used

1.2.3 Final Approved Shop Drawings

The Contractor shall furnish final approved project shop drawings 30 days after transfer of the completed facility.

1.2.4 Construction Contract Specifications

The Contractor shall furnish final as-built construction contract specifications, including modifications thereto, 30 days after transfer of the completed facility.

1.2.5 Real Property Equipment

The Contractor shall furnish a list of installed equipment furnished under this contract. The list shall include all information usually listed on manufacturer's nameplate. The "EQUIPMENT-IN-PLACE LIST" shall include, as applicable, the following for each piece of equipment installed: description of item, location (by room number), model number, serial number, capacity, name and address of manufacturer, name and address of equipment supplier, condition, spare parts list, manufacturer's catalog, and warranty. A draft list shall be furnished at time of transfer. The final list shall be furnished 30 days after transfer of the completed facility.

1.3 WARRANTY MANAGEMENT

1.3.1 Warranty Management Plan

The Contractor shall develop a warranty management plan, which shall contain information relevant to the clause Warranty of Construction. At least 30 days before the planned pre-warranty conference, the Contractor shall submit the warranty management plan for Government approval. The warranty management 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 term "status" as indicated below shall include due date and whether item has been submitted or was accomplished. Warranty information made available during the construction phase shall be submitted to the Contracting Officer for approval prior to each monthly pay estimate. Approved information shall be assembled in a binder and shall be turned over to the Government upon acceptance of the work. The construction warranty period shall begin on the date of project acceptance and shall continue for the full product warranty period. A joint 4 month and 9 month warranty inspection shall be conducted, measured from time of acceptance, by the Contractor, Contracting Officer and the Customer Representative. Information contained in the warranty management plan shall include, but shall not be limited to, the following:

a. Roles and responsibilities of all personnel associated with the warranty process, including points of contact and telephone numbers within the organizations of the Contractors, subcontractors, manufacturers or suppliers involved.

b. 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.

c. A list for each warranted equipment, item, and feature of construction or system indicating:

1. Name of item.
2. Model and serial numbers.
3. Location where installed.
4. Name and phone numbers of manufacturers or suppliers.
5. Names, addresses and telephone numbers of sources of spare parts.
6. Warranties and terms of warranty. This shall include one-year overall warranty of construction. Items, which have extended warranties, shall be indicated with separate warranty expiration dates.
7. Cross-reference to warranty certificates as applicable.
8. Starting point and duration of warranty period.
9. Summary of maintenance procedures required to continue the warranty in force.
10. Cross-reference to specific pertinent Operation and Maintenance manuals.
11. Organization, names and phone numbers of persons to call for warranty service.
12. Typical response time and repair time expected for various warranted equipment.

d. The Contractor's plans for attendance at the 4 and 9 month post-construction warranty inspections conducted by the Government.

e. Procedure and status of tagging of all equipment covered by extended warranties.

f. Copies of instructions to be posted near selected pieces of equipment where operation is critical for warranty and/or safety reasons.

1.3.2 Performance Bond

The Contractor's Performance Bond shall remain effective throughout the construction warranty period.

a. In the event the Contractor fails to commence and diligently pursue any construction warranty work required, the Contracting Officer will have the work performed by others, and after completion of the work, will charge the remaining construction warranty funds of expenses incurred by the Government while performing the work, including, but not limited to administrative expenses.

b. In the event sufficient funds are not available to cover the construction warranty work performed by the Government at the Contractor's expense, the Contracting Officer will have the right to recoup expenses from the bonding company.

c. Following oral or written notification of required construction warranty repair work, the Contractor shall respond in a timely manner. Written verification will follow oral instructions. Failure of the Contractor to respond will be cause for the Contracting Officer to proceed against the Contractor.

1.3.3 Pre-Warranty Conference

Prior to contract completion, and at a time designated by the Contracting Officer, the Contractor shall meet with the Contracting Officer to develop a mutual understanding with respect to the requirements of this section. Communication procedures for Contractor notification of construction warranty defects, priorities with respect to the type of defect, reasonable time required for Contractor response, and other

details deemed necessary by the Contracting Officer for the execution of the construction warranty shall be established/reviewed at this meeting. In connection with these requirements and at the time of the Contractor's quality control completion inspection, the Contractor shall furnish the name, telephone number and address of a licensed and bonded company, which is authorized to initiate and pursue construction warranty work action on behalf of the Contractor. This point of contact will be located within the local service area of the warranted construction, shall be continuously available, and shall be responsive to Government inquiry on warranty work action and status. This requirement does not relieve the Contractor of any of its responsibilities in connection with other portions of this provision.

1.3.4 Contractor's Response to Construction Warranty Service Requirements

Following oral or written notification by the Contracting Officer, the Contractor shall respond to construction warranty service requirements in accordance with the "Construction Warranty Service Priority List" and the three categories of priorities listed below. The Contractor shall submit a report on any warranty item that has been repaired during the warranty period. The report shall include the cause of the problem, date reported, corrective action taken, and when the repair was completed. If the Contractor does not perform the construction warranty within the timeframes specified, the Government will perform the work and back charge the construction warranty payment item established.

a. First Priority Code 1. Perform onsite inspection to evaluate situation, and determine course of action within 4 hours, initiate work within 6 hours and work continuously to completion or relief.

b. Second Priority Code 2. Perform onsite inspection to evaluate situation, and determine course of action within 8 hours, initiate work within 24 hours and work continuously to completion or relief.

c. Third Priority Code 3. All other work to be initiated within 3 workdays and work continuously to completion or relief.

d. The "Construction Warranty Service Priority List" is as follows:

Code 1-Air Conditioning Systems
(1) Recreational support.
(2) Air conditioning leak in part of building, if causing damage.
(3) Air conditioning system not cooling properly.

Code 1-Doors
(1) Overhead or hangar doors not operational, causing a security, fire, or safety problem.
(2) Interior, exterior personnel doors or hardware, not functioning properly, causing a security, fire, or safety problem.

Code 3-Doors
(1) Overhead doors not operational.
(2) Interior/exterior personnel doors or hardware not functioning properly.

Code 1-Electrical
(1) Power failure (entire area or any building operational after 1600 hours).
(2) Security lights
(3) Smoke detectors

Code 2-Electrical
(1) Power failure (no power to a room or part of building).
(2) Receptacle and lights (in a room or part of building).

Code 3-Electrical
Streetlights.

Code 1-Gas
(1) Leaks and breaks.
(2) No gas to family housing unit or cantonment area.

Code 1-Heat
(1). Area power failure affecting heat.
(2). Heater in unit not working.

Code 2-Kitchen Equipment
(1) Dishwasher not operating properly.
(2) All other equipment hampering preparation of a meal.

Code 1-Plumbing
(1) Hot water heater failure.
(2) Leaking water supply pipes.

Code 2-Plumbing
(1) Flush valves not operating properly.
(2) Fixture drain, supply line to commode, or any water pipe leaking.
(3) Commode leaking at base.

Code 3 -Plumbing
Leaky faucets.

Code 3-Interior
(1) Floors damaged.
(2) Paint chipping or peeling.
(3) Casework.

Code 1-Roof Leaks
Temporary repairs will be made where major damage to property is occurring.

Code 2-Roof Leaks
Where major damage to property is not occurring, check for location of leak during rain and complete repairs on a Code 2 basis.

Code 2-Water (Exterior)
No water to facility.

Code 2-Water (Hot)
No hot water in portion of building listed.

Code 3-All other work not listed above.

1.3.5 Warranty Tags

At the time of installation, each warranted item shall be tagged with a durable, oil and water-resistant tag approved by the Contracting Officer. Each tag shall be attached with a copper wire and shall be sprayed with a silicone waterproof coating. The date of acceptance and the QC signature shall remain blank until project is accepted for beneficial occupancy. The tag shall show the following information.

a. Type of product/material_____.

b. Model number_____.

c. Serial number_____.

d. Contract number_____.

e. Warranty period_____from_____to_____.

f. Inspector's signature_____.

g. Construction Contractor_____.

Address_____.

Telephone number_____.

h. Warranty contact_____.

Address_____.

Telephone number_____.

i. Warranty response time priority code_____.

j. WARNING - PROJECT PERSONNEL TO PERFORM ONLY OPERATIONAL MAINTENANCE DURING THE WARRANTY PERIOD.

1.4 MECHANICAL TESTING, ADJUSTING, BALANCING, AND COMMISSIONING

Prior to final inspection and transfer of the completed facility; all reports, statements, certificates, and completed checklists for testing, adjusting, balancing, and commissioning of mechanical systems shall be submitted to and approved by the Contracting Officer as specified in applicable technical specification sections.

1.5 OPERATION AND MAINTENANCE MANUALS

Operation manuals and maintenance manuals shall be submitted as specified. Operation manuals and maintenance manuals provided in a common volume shall be clearly differentiated and shall be separately indexed.

1.6 FINAL CLEANING

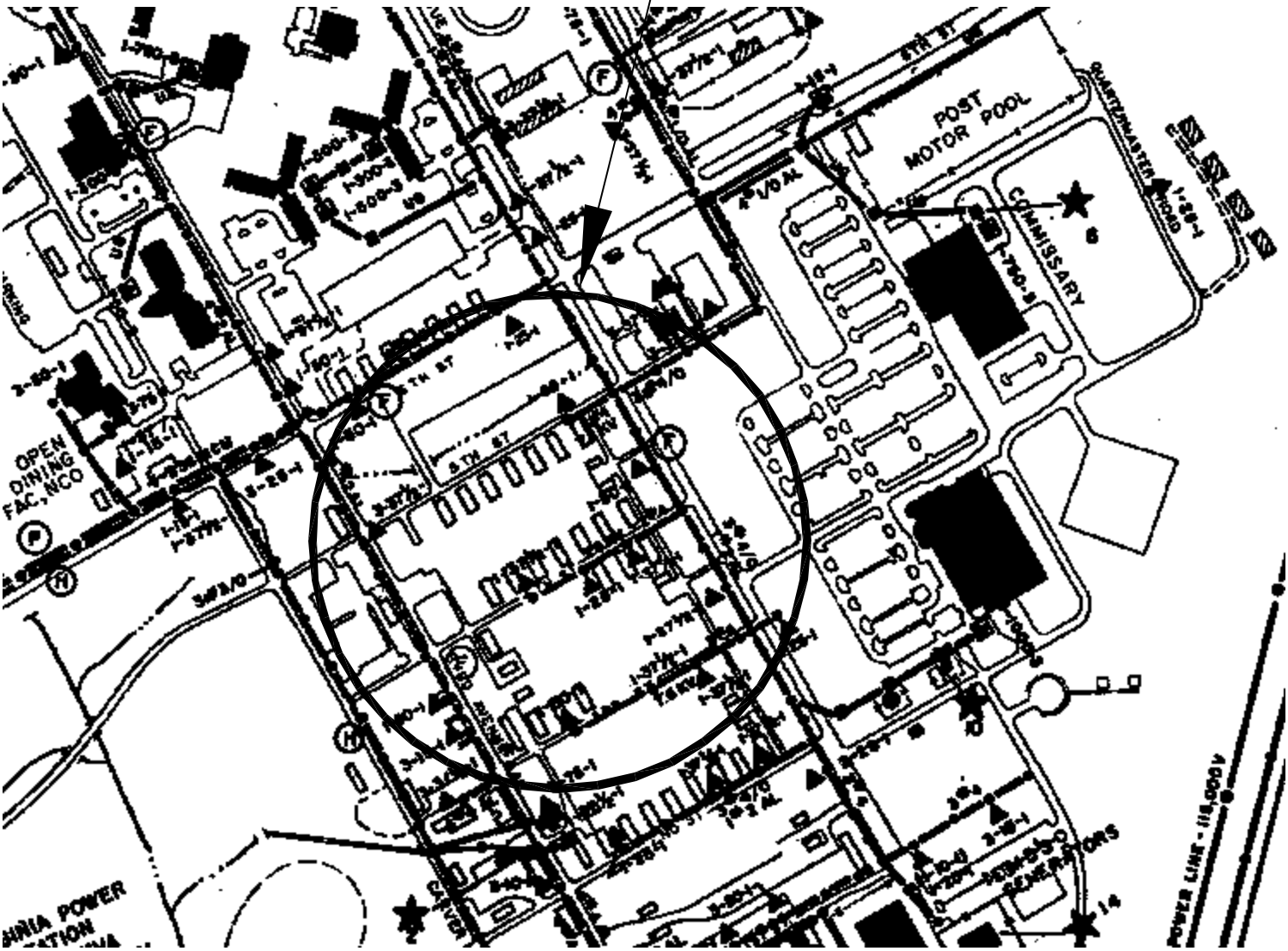
The premises shall be left broom clean. Stains, foreign substances, and temporary labels shall be removed from surfaces. Carpet and soft surfaces shall be vacuumed. Equipment and fixtures shall be cleaned to a sanitary condition. Filters of operating equipment shall be [cleaned] [replaced]. Debris shall be removed from roofs, drainage systems, gutters, and downspouts. Paved areas shall be swept and landscaped areas shall be raked clean. The site shall have waste, surplus materials, and rubbish removed. The project area shall have temporary structures, barricades, project signs, and construction facilities removed. A list of completed clean-up items shall be submitted on the day of final inspection.

2 PRODUCTS (NOT USED)

3 EXECUTION (NOT USED)

ATTACHMENT 2
SITE AND LOCALITY MAPS

FIRE AND EMERGENCY SERVICES CENTER (FESC)



VICINITY MAP: FORT LEE

ATTACHMENT 3
LIST OF DESIGN RFP DRAWINGS

T-1	Cover Sheet
C-1	Location Plan
C-2	Pre-Existing Utilities & Structure
C-3	Existing Conditions
C-4	Site and Utility Layout
C-5	Site Grading and Drainage
A-1	Phase 1 Plan
A-2	Phase 2 Plan
A-3	Phase 1 Furniture Plan
A-4	Phase 2 Furniture Plan
A-5	Elevations
A-6	Elevations
A-7	Elevations
E-1	Electrical and Communication Site Plan

ATTACHMENT 4
GEOTECHNICAL INFORMATION

Summary of Exploratory Test Pits performed 26 February 2003

Fire & Emergency Services Center, Fort Lee, VA

TP-1	Asphalt paving surface encountered at 6" below grade.
TP-2	" " " " " " (possible southerly limit).
TP-3	" " " " at 10" below grade, plus bricks.
TP-4	" " " " " , plus concrete, wood, bricks.
TP-5	No asphalt to 28" depth; encountered concrete to 24" dimension, wood, tiles, insulation.
TP-6	Encountered fill soils with concrete, brick, and wood pieces, to 18" depth.
TP-7	Concrete slab and footing items to 18" dimension, wood, and insulation, to 24" depth.
TP-8	Fill soils only (no debris encountered) to 18" pit depth.
TP-9	Encountered 6" ID iron sewer pipe @ 8" depth; noted roadway asphalt thickness of 2".
TP-10	" " " " " , running east-southeasterly.
TP-11	No sewer or asphalt encountered; fill soils with occasional debris to 18" pit depth.
TP-12	Fill soils only (no debris encountered) to 18" pit depth.
TP-13	Two concrete footing pieces, approx. 12" x 15" x 30" each.
TP-14	Fill soils with wood and roots, to 12" depth.
TP-15	Fill soils with wood, brick and roots, to 18" depth.
TP-16	Concrete footing, approx. 12" x 15" x 72".
TP-17	" " " 12" x 15" x 120".
TP-18	" " " 12" x 15" x 96".
TP-19	Fill soils only (no debris encountered) to 18" pit depth.
TP-20	Fill soils with wood and roots to 12" depth, then fill soils only to 24" pit depth.
TP-21	Fill soils with wood, asphalt and roots to 18" depth.
TP-22	Fill soils with wood and roots to 12" depth.
TP-23	Encountered 6" ID vertical clay sewer (possible cleanout/riser) and concrete (possible structure wall) at 24" below grade.
TP-24	Fill soils only (no debris encountered) to 30" pit depth.
TP-25	" " " " " "
TP-26	" " " " to 24" pit depth.
TP-27	" " " " to 24" pit depth.
TP-28	Surface concrete & asphalt spoils, wood debris, concrete (footing?) pieces at 18" depth.
TP-29	Concrete footings, brick, treated wood, rags (looks like a dump) to 30" pit depth.

Hole No. 194DH-1

DRILLING LOG

DIVISION	NAD
INSTALLATION	CENAO-TS-EG
SHEET	1 OF 2 SHEETS
1. PROJECT	Fire and Emergency Center
2. LOCATION (Coordinates or Station)	4th St. and Adams Ave., Fort Lee, VA
3. DRILLING AGENCY	Fishburne Drilling
4. HOLE NO. (As shown on drawing title and file number)	194DH-1
5. NAME OF DRILLER	Kevin Dodson
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED --- DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	
8. DEPTH DRILLED INTO ROCK	
9. TOTAL DEPTH OF HOLE	50.0
10. SIZE AND TYPE OF BIT	3 5/8" ID HS Auger
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
12. MANUFACTURER'S DESIGNATION OF DRILL	CME 45C
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN	DISTURBED 13 / UNDISTURBED
14. TOTAL NUMBER CORE BOXES	
15. ELEVATION GROUND WATER	65.5
16. DATE HOLE	STARTED 02/24/2003 / COMPLETED 02/24/2003
17. ELEVATION TOP OF HOLE	+94.0
18. TOTAL CORE RECOVERY FOR BORING	%
19. SIGNATURE OF INSPECTOR	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth weathering, etc., if significant) g
+93.5	0.5		Sandy silt with clay, dark brown (TOPSOIL)			
			Sandy clay, trace mica, firm, moist, gray-orange (CH)	63	S1 0.0 2.0	3-4-4-4 N=8
+91.0	3.0			83	S2 2.0 4.0	5-4-5-8 N=9
			Clay, firm to stiff, trace of moisture, gray with yellow-brown mottling (CL-CH)	92	S3 4.0 6.0	5-12-20-25 N=32
+88.5	5.5					
+87.5	6.5		Medium to fine sand, dense, dry, tan-brown (SP)	100	S4 6.0 8.0	9-14-21-25 N=35 Slow drilling
			Clayey silt, trace of mica, firm, dry, gray with yellow-brown mottling. 9'-10'- same with little clay. (ML-CL)	92	S5 8.0 10.0	7-15-18-17 N=33 Very slow drilling
+83.0	11.0					
			Medium to fine sand, medium dense, dry to moist, tan-orange. Fine sand @ 14', dense, dry, gray (SW)	83	S6 13.0 15.0	6-7-6-10 N=13
+78.0	16.0		Medium sand, dry, orange. 19.3'-20'- medium to coarse sand with little fine gravel, moist, gray (SP)	75	S7 18.0 20.0	5-6-7-5 N=13
+73.0	21.0					
			Silty clay, firm, moist, gray (CL-CH)		S8 23.0 25.0	2-3-5-7 N=8
+69.0	25.0					
+67.0	27.0		Medium to coarse sand (with fine gravel @ 25'), moist, orange-gray (SP)			
+65.5	28.5		Silty clay, firm, moist, gray [same as 21'-25'] (CL-CH)		S9 28.0 30.0	7-8-7-6 N=15
			Coarse to medium sand with fine gravel, wet, tan (SP)			

DRILLING LOG (Cont Sheet)

ELEVATION TOP OF HOLE 94.0

Hole No. 194DH-1

PROJECT Fire and Emergency Center

INSTALLATION CENAO-TS-EG

SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth weathering, etc., if significant) g
+62.0	32.0		Coarse to medium sand with fine gravel, wet, tan (SP) *(continued)*			
+55.5	38.5		Clay with silt, firm, moist, gray with some brown mottling (CL-CH)		S10 33.0 35.0	2-5-7-6 N=12
+50.5	43.5		Fine clayey sand, very loose, wet, gray (SC)		S11 38.0 40.0	1-2-2-2 N=4 Sample tested for moisture, grain size and Atterburg limits: See lab test results.
+45.5	48.5		Medium to fine sand, loose-medium, wet, gray (SW)		S12 43.0 45.0	WOH/12"-3-10 N=3
+44.0	50.0		Coarse sand with fine gravel, dense, wet, gray-brown (SP)		S13 48.0 50.0	12-17-20-28 N=37
						BOH @ 50' Cave-In @ 41' WOC = 31

Hole No. 194DH-2

DRILLING LOG

DIVISION	NAD
INSTALLATION	CENAO-TS-EG
SHEET	1 OF 1 SHEETS
1. PROJECT	Fire and Emergency Center
2. LOCATION (Coordinates or Station)	4th St. and Adams Ave., Fort Lee, VA
3. DRILLING AGENCY	Fishburne Drilling
4. HOLE NO. (As shown on drawing title and file number)	194DH-2
5. NAME OF DRILLER	Kevin Dodson
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED --- DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	
8. DEPTH DRILLED INTO ROCK	
9. TOTAL DEPTH OF HOLE	25.0
10. SIZE AND TYPE OF BIT	3 5/8" ID HS Auger
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
12. MANUFACTURER'S DESIGNATION OF DRILL	CME 45C
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN	DISTURBED 10 / UNDISTURBED
14. TOTAL NUMBER CORE BOXES	
15. ELEVATION GROUND WATER	
16. DATE HOLE	STARTED 02/24/2003 / COMPLETED 02/24/2003
17. ELEVATION TOP OF HOLE	+95.4
18. TOTAL CORE RECOVERY FOR BORING	%
19. SIGNATURE OF INSPECTOR	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth weathering, etc., if significant) g
+94.9	0.5		(SM), roots	75	S1 0.0 2.0	3-6-7-8 N=13
+93.9	1.5		Clay, firm, moist, gray (CL)			
+92.9	2.5		Sandy clay, firm, moist, gray-brown (CH)	92	S2 2.0 4.0	5-6-6-7 N=12
			Clay, firm-stiff, moist, gray (CL-CH)	92	S3 4.0 6.0	3-6-11-11 N=17
				92	S4 6.0 8.0	6-11-16-20 N=27
+87.9	7.5		Clay, firm, dry, grey-orange (CL)	83	S5 8.0 10.0	6-8-11-12 N=19
+86.4	9.0		Silty fine sand, trace of clay, soft texture, dry, gray (SP-SM)	75	S6 10.0 12.0	2-4-8-9 N=12
+82.9	12.5		Fine to medium sand, medium dense, dry to moist, gray-orange. 15'-15.2' color change to red. (SP)	83	S7 12.0 14.0	6-9-9-10 N=18
+80.2	15.2			83	S8 14.0 16.0	10-11-13-10 N=24
+79.4	16.0		Medium sand, orange-tan (SP)			
			Same as above with layers of medium to coarse sand, trace of gravel, gray and orange. Moist to wet @ 24.5'-25'. (SP)	83	S9 18.0 20.0	10-11-16-16 N=27
+70.4	25.0			83	S10 23.0 25.0	5-5-5-6 N=10
						BOH @ 25' Caved in @ 20' after augers removed WOC not measured

Hole No. 194DH-3

DRILLING LOG

DIVISION	NAD
INSTALLATION	CENAO-TS-EG
SHEET	1 OF 1 SHEETS
1. PROJECT	Fire and Emergency Center
2. LOCATION (Coordinates or Station)	4th St. and Adams Ave., Fort Lee, VA
3. DRILLING AGENCY	Fishburne Drilling
4. HOLE NO. (As shown on drawing title and file number)	194DH-3
5. NAME OF DRILLER	Kevin Dodson
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED --- DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	
8. DEPTH DRILLED INTO ROCK	
9. TOTAL DEPTH OF HOLE	25.0
10. SIZE AND TYPE OF BIT	3 5/8" ID HS Auger
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
12. MANUFACTURER'S DESIGNATION OF DRILL	CME 45C
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN	DISTURBED 10 / UNDISTURBED
14. TOTAL NUMBER CORE BOXES	
15. ELEVATION GROUND WATER	70.0
16. DATE HOLE	STARTED 02/24/2003 / COMPLETED 02/24/2003
17. ELEVATION TOP OF HOLE	+93.0
18. TOTAL CORE RECOVERY FOR BORING	%
19. SIGNATURE OF INSPECTOR	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth weathering, etc., if significant) g
+92.4	0.6		Silty sand and roots (SM)	75	S1 0.0 2.0	2-2-5-5- N=7 Samlpe tested (1'-1.5') for moisture, grain size, and Atterburg limits: See lab test results.
+91.0	2.0		Sandy clay, medium dense, dry, brown-gray (CH)			
			Clay, firm to stiff, dry, gray (with orange mottling from 5.2'to 7') (CL)	83	S2 2.0 4.0	5-10-14-22 N=24 PP=3.5TSF
				92	S3 4.0 6.0	6-12-16-21 N=28
				100	S4 6.0 8.0	3-5-8-9 N=13
+84.0	9.0			100	S5 8.0 10.0	4-6-9-9 N=15
			Clayey very fine sand, dry, orange-gray. Orange lens @10.8'-11'. Gray @ 11'-13.5'. (SC-CL)	92	S6 10.0 12.0	4-5-9-10 N=14
+79.5	13.5			92	S7 12.0 14.0	5-5-10-12 N=15
+78.5	14.5		Fine sand, dry, gray (SP)			
			Fine to medium sand, dry, gray. Gray-orange @15.5'. Layered medium sand and medium to coarse sand with fine gravel, moist, gray and gray-orange @ 17'-23' (SP)	83	S8 14.0 16.0	6-8-10-11 N=18
				75	S9 18.0 20.0	9-12-9-7 N=21
+70.0	23.0					
+68.0	25.0		Fine to medium sand, trace of fine gravel, wet, gray (SP)	67	S10 23.0 25.0	4-7-7-10 N=14
						BOH @ 25' Cave-in @ 21' after auger removed WOC not measured

Hole No. 194DH-4

DRILLING LOG	DIVISION NAD	INSTALLATION CENAO-TS-EG	SHEET 1 OF 2 SHEETS

1. PROJECT	Fire and Emergency Center
2. LOCATION (Coordinates or Station)	4th St. and Adams Ave., Fort Lee, VA
3. DRILLING AGENCY	Fishburne Drilling
4. HOLE NO. (As shown on drawing title and file number)	194DH-4
5. NAME OF DRILLER	Sonny Seguist
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED --- DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	
8. DEPTH DRILLED INTO ROCK	
9. TOTAL DEPTH OF HOLE	40.0
10. SIZE AND TYPE OF BIT	2 1/2" ID HS Auger
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
12. MANUFACTURER'S DESIGNATION OF DRILL	CME 550X
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN	DISTURBED 13 / UNDISTURBED
14. TOTAL NUMBER CORE BOXES	
15. ELEVATION GROUND WATER	71.0
16. DATE HOLE	STARTED 02/25/2003 / COMPLETED 02/25/2003
17. ELEVATION TOP OF HOLE	+91.0
18. TOTAL CORE RECOVERY FOR BORING	%
19. SIGNATURE OF INSPECTOR	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth weathering, etc., if significant) g
+90.5	0.5		Topsoil and roots (SM)	50	S1 0.0 2.0	2-5-4-4 N=9
+89.0	2.0		Clayey sand, moist, brown (SC)			
+87.6	3.4		Clay, firm, dry, orange-brown (CL)	92	S2 2.0 4.0	4-7-8-12 N=15 PP=4.5TSF @ 3.4'
+83.5	7.5		Clay, stiff, dry, gray (CL-CH)	88	S3 4.0 6.0	4-10-14-10 N=24 Sample tested for moisture, grain size and Atterburg limits: See lab test results.
				75	S4 6.0 8.0	4-10-16-20 N=26
+82.5	8.5		Clayey sand, medium dense, dry brown (SC)			
+80.0	11.0		Fine sand, little clay (@ 9.5'-11'), dry, gray-white (SP)	83	S5 8.0 10.0	3-9-9-9 N=18
				83	S6 10.0 12.0	8-7-14-15 N=21
+77.0	14.0		Fine to medium sand, dry, reddish brown. Color change to orange-yellow @12.5' (SP)	83	S7 12.0 14.0	4-10-14-17 N=24
+75.5	15.5		Clayey sand, dry, gray (SC)	75	S8 14.0 16.0	2-3-21-23 N=24
+67.5	23.5		Medium to coarse sand with fine gravel, dry to moist, orange. Moist, gray-tan @ 18'-19'. Orange-brown @ 19'. Wet @ 19.5'. Saturated @ 23' (SP)	75	S9 18.0 20.0	4-9-9-14 N=18
+63.0	28.0		Coarse sand and fine gravel, saturated, orange brown (SP-GP)		S10 23.0 25.0	1-2-9-8 N=11
			Medium sand, wet to saturated, white/gray/tan-brown (SP)		S11 28.0 30.0	4-4-5-5 N=9 Auger hung up when pulling sample.

DRILLING LOG (Cont Sheet)

ELEVATION TOP OF HOLE 91.0

Hole No. 194DH-4

PROJECT: Fire and Emergency Center

INSTALLATION: CENAO-TS-EG

SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth weathering, etc., if significant) g
+59.5	31.5		Medium sand, wet to saturated, white/gray/tan-brown (SP) *(continued)*			
+54.5	36.5		Clay and very fine to fine sand, very soft, wet, gray-white (CL)		S12 33.0 35.0	Sand running in auger @ 30'-32' / washed out WOH/18"-1 N=0 Sample tested for moisture, grain size and Atterburg limits: See lab test results.
+51.0	40.0		Fine sand, little silt, very loose, wet, gray-white (SP-SM)		S13 38.0 40.0	1-1-2-4 N=3
						BOH @ 40.0' WOC on completion not measured due to wash water Cave-in @ 23' after pulling auger

Hole No. 194DH-5

DRILLING LOG

DIVISION	NAD
INSTALLATION	CENAO-TS-EG
SHEET	1 OF 1 SHEETS
1. PROJECT	Fire and Emergency Center
2. LOCATION (Coordinates or Station)	4th St. and Adams Ave., Fort Lee, VA
3. DRILLING AGENCY	Fishburne Drilling
4. HOLE NO. (As shown on drawing title and file number)	194DH-5
5. NAME OF DRILLER	Sonny Seguist
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED --- DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	
8. DEPTH DRILLED INTO ROCK	
9. TOTAL DEPTH OF HOLE	25.0
10. SIZE AND TYPE OF BIT	2 1/2" ID HS Auger
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
12. MANUFACTURER'S DESIGNATION OF DRILL	CME 550X
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN	DISTURBED 10 / UNDISTURBED
14. TOTAL NUMBER CORE BOXES	
15. ELEVATION GROUND WATER	76.5
16. DATE HOLE	STARTED 02/25/2003 / COMPLETED 02/25/2003
17. ELEVATION TOP OF HOLE	+88.5
18. TOTAL CORE RECOVERY FOR BORING	%
19. SIGNATURE OF INSPECTOR	

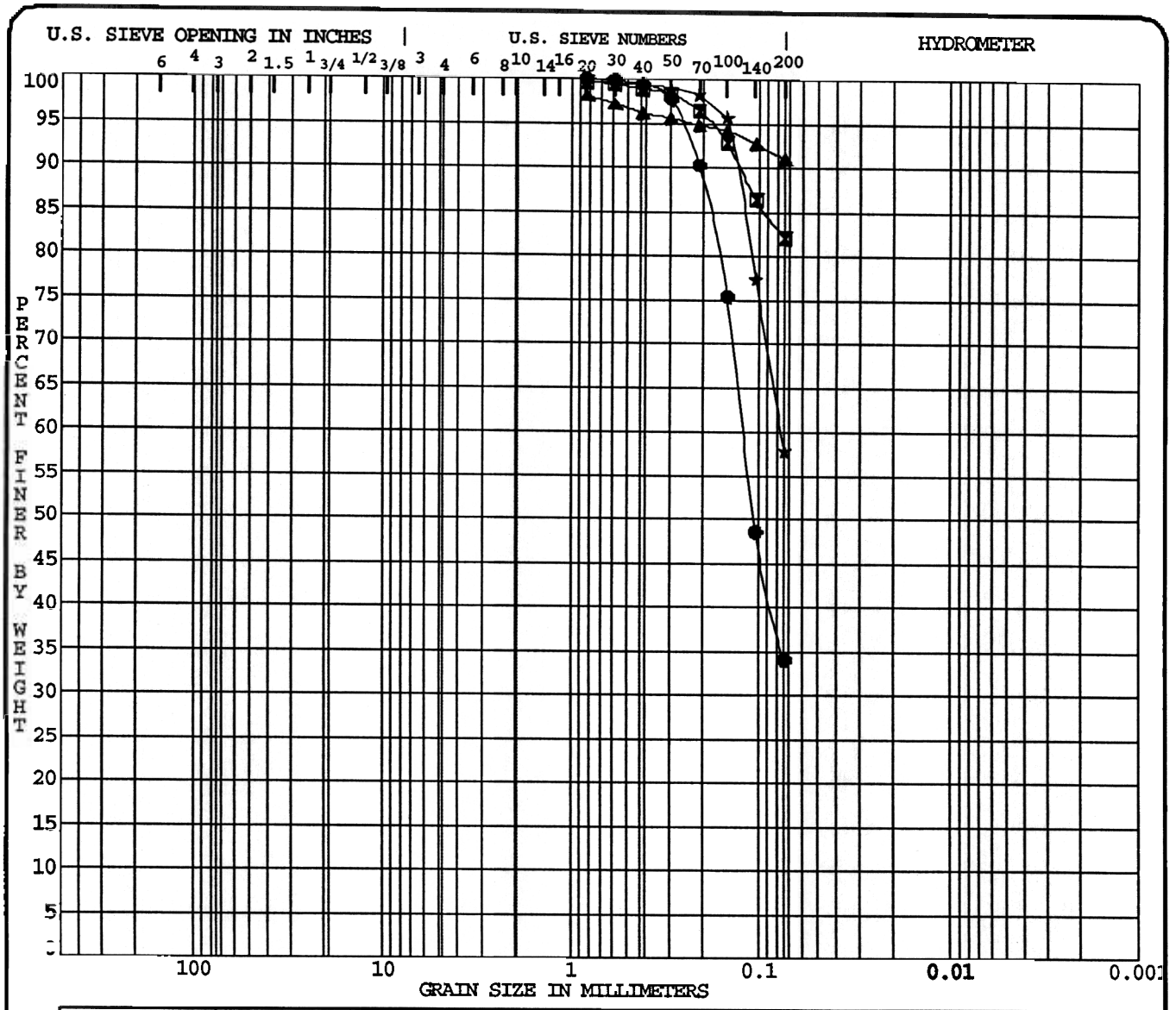
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth weathering, etc., if significant) g
+87.7	0.8		Topsoil (silty sand and roots)		S1 0.0 2.0	2-3-2-3 N=5
+86.0	2.5		Silty sand, moist to wet, brown (SM)			2-2-3-5 N=5
+85.0	3.5		Clayey silt, dry to moist, red-gray (ML-CL)			
+84.0	4.5		Silt, little clay, dry, gray with orange mottling (ML)		S3 4.0 6.0	2-5-8-11 N=13
+83.0	5.5		Clay, dry, gray (CL)		S4 6.0 8.0	3-4-10-12 N=14
+78.0	10.5		Fine sand with silt, dry to moist, gray-white. Orange-tan lens @ 7'-7.2'. Yellow-orange lens @ 9'-9.3' (SP-SM)		S5 8.0 10.0	3-8-11-14 N=19
+76.5	12.0		Fine to medium sand, moist to wet, tan, brown, and orange layers (SW)		S6 10.0 12.0	3-9-10-13 N=19
+68.7	19.8		Medium to coarse sand, trace of gravel, wet to saturated, gray and orange layers (SP)		S7 12.0 14.0	10-13-15-22 N=28
					S8 14.0 16.0	4-10-10-10 N=20 Gravel encountered @ 17.5'
					S9 18.0 20.0	2-5-7-6 N=12
+66.5	22.0		Medium sand, trace of clay, wet, gray-tan (SP)			
+63.5	25.0		Fine sand, saturated, gray-tan		S10 23.0 25.0	1-2-2-2 N=4
						BOH @ 25' WOC @ 19.5' Cave-in @ 17.8'

Hole No. 194DH-6

DRILLING LOG

DIVISION	NAD
INSTALLATION	CENAO-TS-EG
SHEET	1 OF 1 SHEETS
1. PROJECT	Fire and Emergency Center
2. LOCATION (Coordinates or Station)	4th St. and Adams Ave., Fort Lee, VA
3. DRILLING AGENCY	Fishburne Drilling
4. HOLE NO. (As shown on drawing title and file number)	194DH-6
5. NAME OF DRILLER	Sonny Seguist
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED --- DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	
8. DEPTH DRILLED INTO ROCK	
9. TOTAL DEPTH OF HOLE	25.0
10. SIZE AND TYPE OF BIT	2 1/2" ID HS Auger
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
12. MANUFACTURER'S DESIGNATION OF DRILL	CME 550X
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN	DISTURBED 10 / UNDISTURBED
14. TOTAL NUMBER CORE BOXES	
15. ELEVATION GROUND WATER	71.2
16. DATE HOLE	STARTED 02/25/2003 / COMPLETED 02/25/2003
17. ELEVATION TOP OF HOLE	+89.7
18. TOTAL CORE RECOVERY FOR BORING	%
19. SIGNATURE OF INSPECTOR	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth weathering, etc., if significant) g
+89.7	0.0		Sandy silt and roots, moist, brown (TOPSOIL)	83	S1 0.0 2.0	3-7-8-14 N=15
+88.7	1.0					
+87.7	2.0		Sandy silt, dry, gray (ML)			
			Clay, stiff, dry, gray with orange mottling (CH)	83	S2 2.0 4.0	3-6-10-10 N=16
				100	S3 4.0 6.0	5-12-17-22 N=29 PP=4.0 TSF
+83.2	6.5					
			Silt, little clay, stiff, dry, gray (MH)	100	S4 6.0 8.0	5-7-12-16 N=19
+81.7	8.0					
			Fine sand, trace of silt, moist, gray, orange, and tan layers (SP)	83	S5 8.0 10.0	4-6-7-5 N=13
+79.2	10.5					
			Fine to medium sand, moist, orange-gray (SP)	83	S6 10.0 12.0	3-5-5-5 N=10
				75	S7 12.0 14.0	2-4-3-4 N=7
+75.2	14.5					
+74.2	15.5		Fine to medium sand with gravel, moist, reddish brown (SP)	75	S8 14.0 16.0	2-3-5-3 N=8
			Medium sand, moist, gray- orange. Wet @ 18.5' (SP)			
+70.7	19.0				S9 18.0 20.0	1-2-9-9 N=11
+70.2	19.5		Coarse sand and gravel, saturated, reddish orange (SP-GP)			
			Coarse to medium sand, saturated, gray-orange (SP)			
					S10 23.0 25.0	3-5-6-5 N=11
+64.7	25.0					
						BOH @ 25' WOC @ 19.0' Cave-in @ 19'



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample ID	(depth)	Classification	MC%	LL	PL	PI	Cc	Cu
●	194DH-1	(39.0)	CLAYEY SAND SC		30	17	13		
⊠	194DH-3	(1.0)	FAT CLAY with SAND CH		85	20	65		
▲	194DH-4	(5.0)	LEAN CLAY CL		41	17	24		
★	194DH-4	(34.0)	SANDY LEAN CLAY CL		30	17	12		

	Sample ID	(depth)	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	194DH-1	(39.0)	0.84	0.12			0.0			
⊠	194DH-3	(1.0)	0.84				0.0			
▲	194DH-4	(5.0)	0.84				0.0			
★	194DH-4	(34.0)	0.84	0.08			0.0			

PROJECT Fire and Emergency Center - 4th St. and Adams Ave., Fort Lee, VA

JOB NO. 194

DATE

GRADATION CURVES

Corps of Engineers, Norfolk District

ATTACHMENT 5
FORT LEE INSTALLATION DESIGN GUIDE

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1.1 Fort Lee Correspondence

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Installation Design Guide

Executive Summary

MAKE NO LITTLE PLANS; they have no magic to stir men's blood and probably themselves will not be realized. Make big plans; aim high in hope and work, remembering that a noble, logical diagram once recorded will never die, but long after we are gone will be a living thing, asserting itself with ever growing insistency. Remember that our sons and grandsons are going to do things that would stagger us. Let your watchword be order and your beacon beauty. Daniel Burnham 1907

Fort Lee, Virginia

DEPARTMENT OF THE ARMY
UNITED STATES ARMY COMBINED ARMS SUPPORT COMMAND
AND FORT LEE
3901 A AVENUE SUITE 200
FORT LEE, VIRGINIA 23801-1809

REPLY TO
ATTENTION OF

Office of the Commanding General

19 October 1998

MEMORANDUM FOR: Military and Civilian Personnel of Fort Lee

SUBJECT: Fort Lee Installation Design Guide (and IDG Executive Summary)

l. Fort Lee is upgrading design standards in keeping with the Installations of Excellence concepts. I have reviewed, and endorse, the goals and objectives outlined in the Fort Lee Installation Design Guide and Executive Summary.

2. Fort Lee will apply the standards of the Installation Design Guide to design, construct, maintain, and repair the installation. These standards will help ensure that the images and themes which instill pride in soldiers, civilians, and family members are preserved and strengthened in our facility planning.

3. I believe that Fort Lee has maintained a tradition of aesthetics and cohesion in planning which is obviously the product of professional teamwork. I would particularly ask commanders to consult the chapter with "Do's and Don't's" when making decisions that may affect post visual aesthetics. Your understanding of and compliance with these standards will enable us to continue that tradition into the future, and ensure that Fort Lee is a source of pride for all who have the opportunity to train, live, or work here.

4. Command and staff adherence to the principles and standards set forth in this guide is essential to achieving a postwide environment that reflects individual as well as collective pride at Fort Lee.

Sincerely,

Daniel G. Brown
Major General, U.S. Army
Commanding

The Fort Lee Installation Design Guide – '**IDG**'
and the IDG **Exec**utive **Summ**ary
are computer accessible at Fort Lee as follows:
Network Neighborhood, Vs2, DPW, shares, FtleeIDG

Installation Design Guide

Executive Summary

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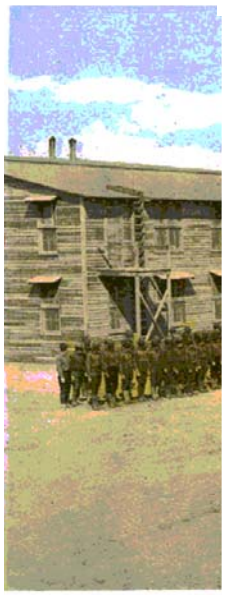
2.1 The Installation Design Guide



Fort Lee, as a TRADOC installation, is charged with the responsibility of developing the logistics concepts for the future and training the Army of tomorrow. In this capacity, it serves as the home of the Combined Arms Support Command and Quartermaster Corps. In these roles Fort Lee provides the environment within which soldiers-in-training develop long lasting impressions and attitudes toward themselves and the Army. Therefore, this environment must be one which fosters pride, commitment, and professionalism, while encouraging each individual to set high standards of personal performance. To achieve these goals, the design of the physical environment itself must demonstrate the value of excellence.

The Installation Design Guide (IDG) is a tool for achieving excellence in installation design. It is a manual which establishes specific design criteria and outlines a program to maintain and enhance Fort Lee's visual assets while correcting visual liabilities. The overall goal of these efforts to improve the quality of design is intended to develop an installation environment that will inspire pride, promote morale, and increase productivity.
(See FL. 2-1)

The Installation Design Guide has been developed through a careful process, beginning with a thorough analysis of the various visual zones which make up the environment of the post. Out of this analysis has emerged an understanding of the overall image of Fort Lee and the establishment of a theme for developing specific goals, priorities, and actual design guidelines for the installation. These guidelines address specific physical design issues relating to particular areas as well as general issues concerning prototypical conditions throughout the installation. In general, the scope of the IDG encompasses all significant aspects of Fort Lee's exterior visual environment which can be influenced by construction or maintenance.

The IDG's design criteria are to be implemented by the Directorate of Public Works (DPW). The DPW staff will apply the IDG directly in their own work and will include relevant sections of the design criteria with their instructions to Architectural/Engineering design firms who will be contracted to design future facilities at Ft. Lee. (See FL. 2-2)

Panoramic view of the main cantonment area, circa 1917.

FL. 2-2 ***The 1st Logistical Command Memorial / Parade Field area is one of Ft. Lee's most important ceremonial spaces.***

FL. 2-1

View of barracks and grounds, circa 1917. (Source: Quartermaster Museum photographic collection.)

(Source: Quartermaster Museum photographic collection.)

2.2 Visual Analysis

The visual character of Fort Lee is a result of several phases of development over a period of eight decades, each phase being a response to programmatic needs and the inherent opportunities of the site. With each major build-up, previous development was almost entirely replaced with new facilities. As a result, Fort Lee has few historical structures and continues to be a forward looking installation where future development will play a major role in determining the visual environment.

The street grid pattern that forms Fort Lee's characteristic crescent-shaped cantonment area was established in the first major build-up for WWI in 1917 and continues to serve as the framework for development today. (See FL. 2-3) A Avenue forms a crescent-shaped spine, linking clusters of facilities from the Blockhouse to the CASCOM building.

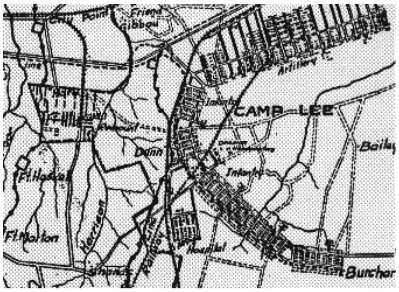
Grids of temporary wooden buildings dominated the physical design of Fort Lee after the massive build-ups for WWI, WWII, and the Korean War. Although few of these original buildings remain today, their linear grid pattern is still apparent in remnant street locations. (See FL. 2-4)

Route 36 provides the public face of Fort Lee as a highway corridor flanked by tall loblolly pines passing through the installation. These pines buffer the views into the post and create an institutional environment along the highway, in contrast to the nearby strip commercial development. The two primary gates at Lee Avenue and Sixth Street establish the beginning and end of this corridor and lead to the A Avenue spine.

Lee Avenue intersects A Avenue, bisecting the spine, forming an open space corridor with the athletic fields, and terminating at the Fort Lee Officers' Club.

Along the length of the A Avenue spine is the training campus, integrating living and training facilities. This campus-like environment is composed of modern barracks, buildings, and open training grounds. Nearby training buildings include industrial scale shops, food service buildings, and administrative buildings. The present appearance of this area will be dramatically altered by extensive future development plans over the next decade; as is already exemplified by a newly developed Community Services Area at the northeastern end of the crescent and the newly developed 'Soldier One Stop' near the southwestern end of the crescent. (See FL. 2-5 and FL. 2-6)

The crescent wraps around the forested stream valley of Bailey Creek. This woodlands area provides a natural setting for training activities, forms a forested edge along many areas of the post, and buffers the family housing areas. These housing areas have the appearance of suburban neighborhoods. The streetscape and front lawns form the public spaces, and the edge of the forest forms an important visual amenity. The golf course nearby provides a park-like setting for the A Avenue gate. (See FL. 2-7)



FL. 2-3
The crescent - shaped cantonment is clearly established by 1917. (source: Archaelogical and Historical Survey of Fort Lee, 1985.)

FL. 2-4
Typical frame structures of the WWI building campaign, circa 1917. (Source: Quartermaster Museum photographic collection.)

FL. 2-5
The newly developed PX, with its expansive parking lots, is a hub of activity, much like a commercial shopping center.

FL. 2-6
The newly developed Soldier One Stop serves as the In-processing Center for the post.

Industrial Edge: Storage/open space, warehouse and training
Forest Drive: Highway 36 scenic drive through canopy of trees
Storage buildings are viewed from highway under tree canopy
Major gateway: Main entrance lined with pines
Entrance Node: Gateway, Mifflin Hall, Parade Ground, symbolic open space
Lee Avenue: Central spine terminating at Officers' Club
South Crescent
Park Edge: Historical Petersburg Battlefield, soft green edge
Mahone Avenue Gate: Minor entrance
Node: ALMC Center
Training/Living: Confused circulation and lack of orientation
Node: CASCOM
Sixth Street entrance to become a major entry
Community Area: PX/Commissary
Blockhouse: Landmark, massive structure with poor surrounding environment
Stream Valley: Bailey Creek
Northern Training/Living Area
Woodland Drive: Saratoga Drive defined by forest edge
Community Area: Post Office and surrounding community facilities
Residential: Living areas and community facilities
Woodland Edge: Pleasant forest setting
A Avenue Gate: Minor entrance
Parkland: Open space of golf course
Training buildings and empty lots in woodland settings lack identity

FL. 2-7

2.3 Image Definition

The visual image of Fort Lee has evolved through cycles of war-time buildup and the transition to permanent facility development since the early 1950's. The continuous street grids, forming the crescent-shaped Living/Training Campus are punctuated by the open lawns of the parade grounds both at Mifflin Hall and within the barracks areas. (See FL. 2-9) The forest edge provides a visual amenity throughout, defining the Bailey Creek stream valley and the edges of the historic Petersburg battlefield. Open meadows, where WWII era wooden structures once stood in rigid formation, now bloom with tall native grasses and provide space for recreation or potential mobilization. In essence, Fort Lee is a training campus surrounded by the pine forests and rolling hills of the Virginia peninsula. (See FL. 2-8)

Fort Lee as a whole is a composite of individual visual zones, each having a particular character. Identifying these visual zones allows design criteria to respond appropriately to the particular characteristics of each area within Fort Lee. In some areas a specific type of activity or land use is the factor which distinguishes one zone from another. More often, however, a visual zone encompasses an area much larger than one single land use reservation and is defined by landscape elements, hills and stream valleys, patterns of roadways, and the clustering of buildings. (See FL. 2-10)

In order to achieve a sense of visual orderliness, facilities within each visual zone must be coordinated by design criteria appropriate for that particular area. Therefore, the design criteria of the IDG are organized according to these zones.
(See FL. 2-11) These visual zones are:

Gateways, *including the Route 36 corridor as well as all entry areas.*

Living-Training Campus, *extending the length of the crescent.*

Industrial Areas, *in the Shop Road/Railroad Avenue area.*

Community Services Areas, *including athletic facilities and Officers' Club areas as well as the Post Exchange and Commissary areas.*

Tenant Facilities Campus, *including the ALMC area, Petroleum School, and other facilities in the Thirty-Eighth Street area.*

Family Housing, including family housing areas A, B, and C.

Open Space and Field Training Areas; *including the Bailey Creek Valley Golf Course as well as key training areas north of Route 36.*

Campus Environment

Crescent Cantonment

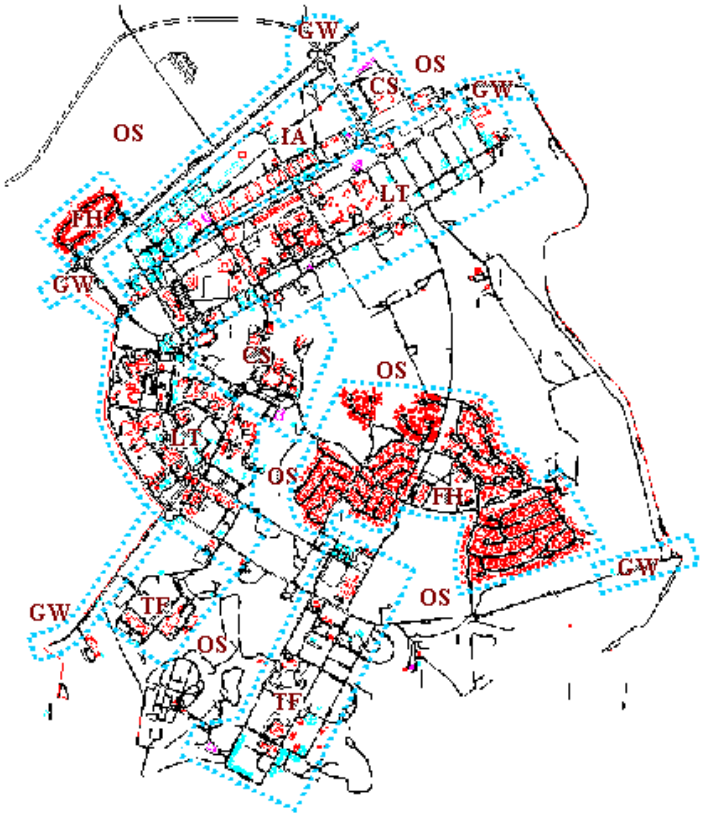
Woodland Setting

FL. 2-8
Daily "PT" brings platoons of runners onto B Avenue.

FL. 2-9 ***The formal parade ground at Mifflin Hall.***

FL. 2-10 ***The Leader's Club provides a visual terminus for the tree-lined Lee Avenue.***

GW	Gateway
LT	Living-Training
IA	Industrial Area
CS	Community Services Areas
TF	Tenant Facilities
FH	Family Housing
OS	Open Space and Field Training



FL. 2-11

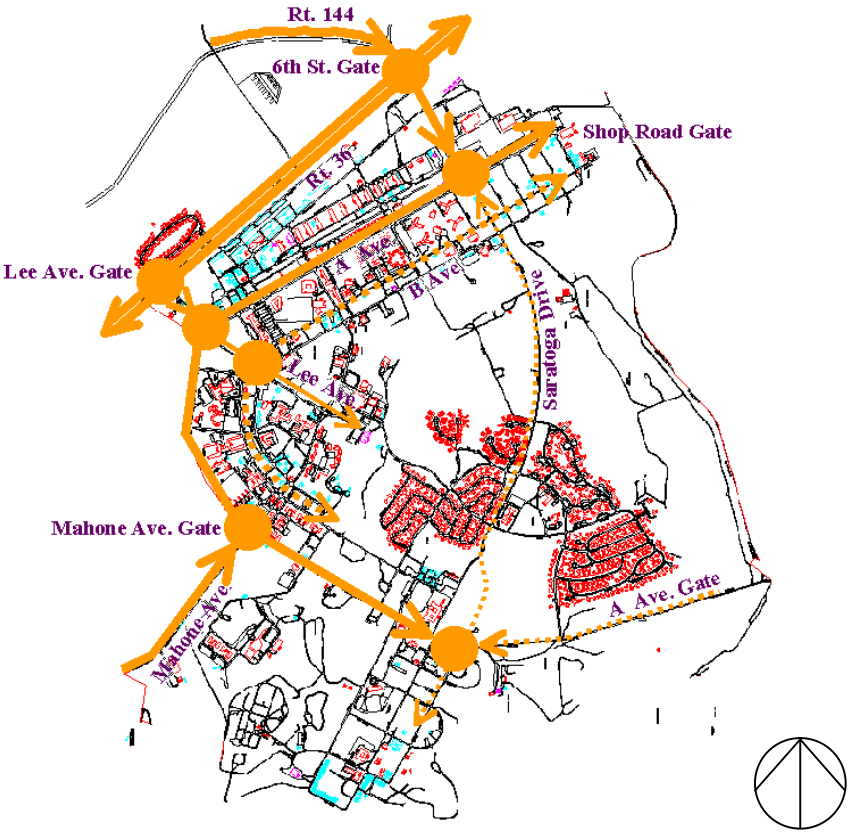
2.4 Movement and Circulation Systems

The main circulation routes within Fort Lee form the primary organizing element of the post and to a large extent are a major determinant of the visual quality of the installation. A Avenue forms a continuous spine, linking together the various parts of the installation. Along this spine, key intersections and entry gateways form traffic nodes which orient movement to the surrounding facilities. These nodes include the intersections at Sixth Street, Lee Avenue, Mahone Avenue, and Saratoga Avenue. Saratoga Avenue links the two ends of the crescent through the Bailey Creek forested stream valley and serves as a VIP route from the helipad at Third Street to the CASCOM building. (See FL. 2-13)

Pedestrian movements are extremely important at Fort Lee, including platoons, small groups, and individuals. Troops assemble outside barracks and march across A Avenue to training areas and classroom buildings, or run in formation for group physical exercise, mixing with vehicular traffic along B Avenue. (See FL. 2-12) Smaller groups and individual soldiers regularly walk from the barracks areas to the athletic/community facilities or Post Exchange.

FL. 2-12

Platoons of runners mix with vehicular traffic along B Avenue.



FL. 2-13

2.5 Assets and Liabilities

FL. 2-14
The removal of older frame structures provides opportunities for future development sites.

A clear understanding of the strengths and weaknesses of the existing visual environment at Ft. Lee is essential to target future efforts to improve the quality of the installation's design. The following chart identifies the most significant visual assets and liabilities for each visual zone. The assets represent positive features which should be preserved and enhanced because they contribute to an image of quality, while the liabilities represent negative aspects which detract and should be corrected.
(See FL. 2-14, FL. 2-15, FL. 2-16, FL. 2-17)

Visual Zones	Assets	Liabilities
Gateways		
	Corridor-of-pines, institutional image along Rt. 36.	Warehouse buildings and storage yards are visible through the trees from Rt. 36.
	Open space and forests flanking Mahone Ave. entry road.	The areas at the intersection of Mahone and A Avenues need to be reforested, now that removal of WW II buildings has been accomplished.
	Main entry from Rt. 36 and Temple Avenue onto 6th Street	Existing roads have mismatched lane configuration
		6th Street gate does not meet current criteria for force protection
Living-Training		
	Future Development plans are an opportunity for significant improvements.	Lack of overall area development concept plan can lead to appearance of uncoordinated development.
	Strong spatial organization along a linear spine.	Lack of circulation hierarchy allows redundant roadways to disrupt the cohesive campus area.
Community Services Areas		
	Concentration of related facilities in centralized locations.	Lack of clear organization, confusing circulation patterns at P.O. area.
	High quality architectural and landscape treatment at Commissary.	Poor visual image of service/delivery areas and mechanical equipment at P.O. area and Shoppette.

Visual Zones	Assets	Liabilities
Industrial Area		
	Mature loblolly pine edge along Rt. 36 and at Lee Ave. gateway.	Lack of adequate visual screening along Rt. 36 edge and at 6th St. gateway.
	Strong spatial organization and proximity to barracks area.	
Tenant Facilities		
	Parklike setting for ALMC.	Circuitous access routes leading to ALMC Center.
		Insufficient parking areas to accommodate demand at ALMC.
	Mature canopy trees create unique setting in 38th St. area.	Remnant street patterns of 38th St. area cause arbitrary divisions of future development sites.
Neighborhood Family Housing		
	High quality appearance of the buildings.	Poor image of Shoppette at Lee Ave. and Rt. 36.
		Poor quality street/parking relationship in some areas.
	Rolling hills and forested areas provide rich natural setting for housing areas.	Lack of screening of mechanical equipment, and personal storage in some areas.
Open Space and Field Training		
	Natural setting of Bailey Creek Valley provides rich natural setting for training exercise.	Lack of adequate storm water management program causes erosion of swales and stream valleys.

FL. 2-15
Forested areas throughout Fort Lee provide a rich natural setting.

FL. 2-16
The ALMC Center projects the image of a research and administrative campus.

FL. 2-17 ***The Quartermaster Museum represents a visual asset.***

2.6 Goals and Objectives

The visual image of Ft. Lee is the product of a multitude of decisions affecting the built environment made over a long period of time by many individuals at various levels of responsibility. This continuous decision-making process must be directed by an overall long-range strategy aimed at developing a coordinated image of quality and excellence. This strategy must consider not only the activities and physical features that exist on the installation today, but also future programs that will be developed. The Design Guide will be directed by the following goals and objectives, which represent an overall strategy for installation design at Fort Lee and are prioritized in the following manner. (See FL. 2-20)

FL. 2-18

Barracks of the northern crescent area are important elements of the Living-Training Area environment.

2.6.1. *Develop a living-training "campus" environment that is cohesive, efficient, and attractive.*

The barracks and training areas along A, B, and C Avenues constitute the core of Fort Lee where living and training activities take place in an integrated cluster of facilities. The spatial relationships of barracks buildings to surrounding open training fields, parade grounds, courtyards, support facilities, access roads, parking lots, and athletic fields must be carefully coordinated to best accommodate important functional relationships and to enhance the visual image.

To achieve this goal a general Development Concept Plan should be produced for the crescent area, so that each individual improvement project, such as the redevelopment of the various barracks, is conceived as part of an overall unified scheme. (See FL. 2-18)

2.6.2.1. *Develop a discrete pedestrian/troop movement network and open space system, based on the crescent "spine" organization that now exists.*

B Avenue should be converted to a troop movement and pedestrian circulation spine linking together all living-training activities along the crescent area. This spine should be appropriately paved and landscaped to provide a linear focal space for pedestrian movement, as well as for group activities such as troop mustering, parading, and everyday physical training exercises. This linear spine should be the focus of the living-training campus area, and buildings should be oriented to emphasize this focus. Vehicular access to buildings lying between A and C Avenues should be organized so that traffic across the B Avenue spine is minimized. When minor cross traffic is required, the pedestrian should have right of-way and the spine treatment should be carried across the road. Parking areas should be kept close to A and C Avenues, which will become the major vehicular circulation elements.

The character of this pedestrian spine should also be extended along routes linking other significant activity centers on the post, such as the Community Services Areas. Points where these well traveled routes cross roadways should be well marked.
(See FL. 2-19)

FL. 2-19

A trip to the Post Exchange area. A network of pedestrian pathways links the Living-Training Area with the Community Services Areas.

2.6.2.2. *Establish A Avenue as the primary vehicular circulation spine to create a strong linear unifying element.*

The roadway should appear as a consistent element linking together the various areas of the post from First Street through the Sixth Street, Lee, and Mahone Avenues gateway intersections to the CASCOM building at Saratoga Drive. (See FL. 2-21) The hierarchy of

1 Develop a living-training "campus" environment that is cohesive, efficient, and attractive.

2a Develop a discrete pedestrian troop movement network and open space system, based on the crescent "spine" organization.

2b Establish A Avenue as the primary vehicular circulation spine to create a strong linear unifying element.

3 Improve visual quality of Community Services Areas.

4 Develop a strong identity and high quality visual image for the In-processing area.

5 Develop an attractive "gateway" environment at all primary and secondary entrance areas.

6 Improve the visual quality of the tenant areas, establishing a strong focus for each cluster of related facilities.

7 Enhance quality of residential areas through improvements to the streetscape, yard areas and building exteriors.

8 Protect and improve woodland environment.

9 Enhance the image of field training areas.

FL. 2-20

primary, secondary, and tertiary road types should be reinforced through the uniform treatment of landscaping, roadway cross section and building setbacks and orientation. Gateway intersections should appear as important nodes with generous building setbacks and large-scale monuments where appropriate, as well as clear and efficient directional signage. Redundant parallel streets should be minimized and eliminated where possible to allow larger contiguous spaces for development and simplified traffic patterns.

FL. 2-21

The CASCOM building with its generous building setback and landscape treatment marks the intersection of A Avenue and Saratoga Drive.

2.6.3. *Improve the visual quality of the Community Services Areas.*

Vehicular access to and circulation through parking areas should be better organized. Adequate planting buffers should separate parking areas from the main roads, and appropriate landscaping should be added within the parking areas. Pedestrian zones should be established and linked with pedestrian routes leading to barracks and housing areas. Orientation of building entrances and service areas should be coordinated to eliminate conflicts and to correct unsightly conditions.

2.6.4. *Develop a strong identity and high quality visual image for the Bldg. 1109 / 1st Street area.*

Major renovation of Bldg. 1109, affectionately known as the "blockhouse", provides an opportunity to address a serious visual liability. (See FL. 2-22) The renovated blockhouse, on 1st St., will form the anchor for a cluster of related facilities which should formally establish a northeastern terminus of the A/B/C Avenues corridor. A unified image should be developed for this area through coordinated design and siting of buildings, roadways, and parking areas, establishing a focal open space surrounded by functionally related buildings. Vehicular circulation should be organized to link the area with the 6th St. gateway via A Ave. The end of A Ave. should be designed as a significant terminus and linked with C Ave. along a realigned street which allows for a generous setback at the expanded blockhouse.

FL. 2-22

The "blockhouse" on 1st Street forms the anchor of the northeastern terminus for the A/B/C Avenues corridor.

2.6.5. *Develop attractive "gateway" environments at all primary and secondary entrance areas.*

Reinforce the existing positive image along the Rt. 36 highway corridor and along the Lee Ave. entrance. Visual screening should be improved by allowing under-story growth to develop beneath the tall loblolly pines which form a buffer strip between the highway and the industrial area. Visual clutter at the highway intersections should be minimized and appropriate signage and monuments should be carefully located.

Develop a high quality gateway environment at the new grade separated 6th St. / Rt. 144 entrance area. The loblolly pine highway buffer strip should be extended along both sides of 6th St. and around the elevated ramps of the new Rt. 144 intersection to establish a tree-lined boulevard image similar to that of Lee Ave., and to screen views to the adjacent industrial area.

The visual quality of secondary entrances at Mahone Ave., A Ave., and Shop Rd. should be improved by coordinated signage and appropriate landscaping. (See FL. 2-23)

FL. 2-23

A Avenue forms a vehicular spine extending through the length of the "crescent" cantonment area.

2.6.6. *Improve the visual quality of the tenant areas, establishing a strong focus for each cluster of related facilities.*

An overall area development concept plan should be produced for ALMC center as well as for the Petroleum School and other tenant facilities that will be developed in the 38th Street area. The abundance of mature canopy trees in this area is a unique asset and should be preserved. The current program of removing aged frame structures should be continued. Unnecessary or redundant streets should be removed to create greater flexibility for siting new facilities and to consolidate and simplify traffic patterns. The access road to the ALMC Academy building should be realigned to lead directly to the entrance, and parking areas should be organized and landscaped throughout.

2.6.7. *Enhance quality of residential areas through improvements to the streetscape, yard areas, and building exteriors.*

The removal of overhead utilities and construction of new housing is an opportunity to significantly improve the visual image of the residential streets, as exemplified by the Phase I redevelopment of Jackson Circle. (See FL. 2-24 and FL. 2-25)

Phase I at Jackson Circle and at Harrison Villa have been completed. Proposed Phase II development at Jackson Circle would result in more housing units, as will the proposed and funded Phase II development soon to begin at Harrison Villa. Additional units would also result from Phase III development currently proposed for Harrison Villa.

FL. 2-24

Jackson Circle housing area.

FL. 2-25 ***Attached housing units in Jackson Circle.***

2.6.8. *Protect and improve woodland environment.*

Enhance the quality of woodland areas as natural settings for troop training and as visual amenities for adjacent facilities and residential neighborhoods. Allow the natural understory growth to develop at the forest edge along a consistent mow line. Restrict clear cut tree harvesting to areas out of view from roadways or from active areas of the post. Maintain pathways through the woodlands, converting derelict paved roadways to gravel paths suitable for troop movements. Finally, minimize adverse effects of soil erosion in the Bailey Creek Valley through adequate storm water management. (See FL. 2-26, FL. 2-27, and FL. 2-28)

2.6.9. *Enhance the image of field training areas.*

Design of field training facilities should be coordinated to develop a distinctive and identifiable image. Outdoor instruction areas should be located and designed with careful consideration of sun orientation, wind and other microclimatic conditions to support the training activity. Finally, routes used for troop movements should be suitably paved and graded for foot traffic. (See FL. 2-29, FL. 2-30, and FL. 2-31)

FL. 2-26

FL. 2-27

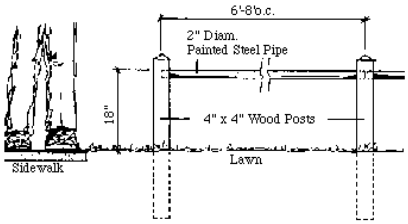
FL. 2-28

Adjacent Petersburg National Battlefield Park represents an exemplary treatment of woodland environment.

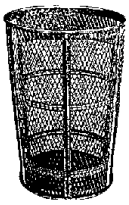
FL. 2-29 ***Field Training Facilities should be planned with careful consideration for environmental factors.***

FL. 2-30

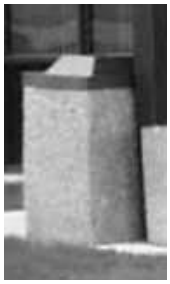
FL. 2-31



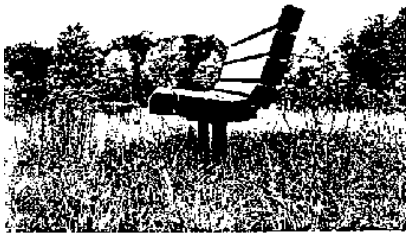
FL. 2-32



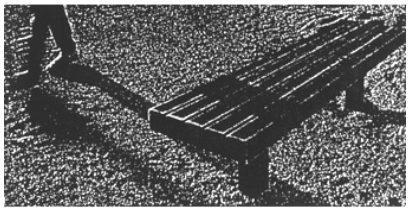
FL. 2-33



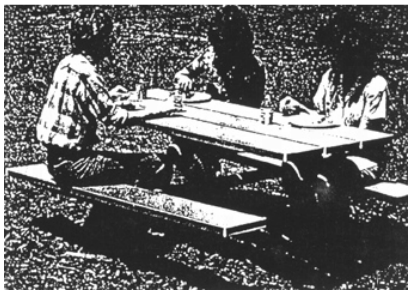
FL. 2-34



FL. 2-35



FL. 2-36



FL. 2-37

The visual image of Fort Lee not only depends upon, but also profits greatly from, the observance of established design criteria. The following basic guidelines, extracted from the Installation Design Guide (IDG), are provided for your referencing convenience, and adherence as applicable to your specific situation:

Landscaping: No landscaping timbers
No paint around bases of trees
No tires around bases of trees
No gravel around bases of trees
No retaining walls around bases of trees
4" - 6" of mulch and/or flowers around bases of trees

Site Furnishings:

Lawn Barrier Railings: 18" high, 2" diameter
Create using Dark Terra Cotta steel pipe rail with 4"x4" wood posts spaced 6'- 8'apart (See FL. 2-32)

Trash Receptacles:

General Use: Metal Receptacle
heavy gauge hot dipped galvanized steel with tapered utilitarian design and black painted finish (See FL. 2-33)
- *United Metal Receptacle Corp.* Model No. SBR-52
32 Inch Ht., 24 Inch Dia. (further reference - IDG)

High Visibility Use in Living/ Training, Community Service and Tenant Facilities Areas: Square Receptacle
reinforced (concrete) exposed aggregate with linear low density high impact resistant polyethylene liner and lid with receptacle hole n it. (See FL. 2-34)
- *The BEST Litter Receptacles, Inc.*
(various models/sizes) (further reference - IDG)

Benches:

General Use: Contour Bench
wood seat and back in natural wood color with black metal supports (See FL. 2-35)
- *Landscape Forms/LFI* Model No. Timberline 3.13
(Redwood or Red Oak) 313PE2572 POE: Support
(square tubular embedded) (further reference - IDG)

Use in Living/Training, Industrial, and Tenant Facilities Areas: Backless Wood Bench with natural color
simple wood slat seat and embedded black metal pedestal (See FL. 2-36)
- *Landscape Forms/LFI* Model No. Forum 39 PE 1972
Redwood, PDE Support (square tubular embedded)
(further reference - IDG)

Picnic Tables: Natural color pressure-treated wood top and seats, galvanized pipe supports with black finish, single pedestal with two seats per table
(See FL. 2-37)
- *Gametime* Model No. 795, 6ft Single Post Picnic Table
(further reference - IDG)

(See FL. 2-42 Landscaping/Site Furnishing Matrix)

Site Furnishings:

Storage Shed:

General Use: Storage / Hazardous Materials Storage
Easi-Set Precast Building
8'8" high, 10'x12' or 12'x20' area
(See FL. 2-38)
(See also, page 28)

- *Smith-Midland Corporation*
P.O. Box 300
Midland, Virginia 22728
(703) 439-3266

FL. 2-38
Storage Shed

Smoking/Picnic Shelters:

General Use: Gazebo
Treated wood with roof shingles color coordinated to the WWII building
(See FL. 2-39)
(See also, page 27)

- *Leonard Utility Buildings*
9524 Jeff. Davis Highway
Richmond, Virginia 23237
(804) 271-8112

FL. 2-39
Smoking/Picnic Shelter

High Visibility Use
in Living/Training,
Industrial, and
Tenant Facilities Areas: Detached
Designed and constructed of materials to coordinate with the permanent building
(See FL. 2-40)
(See also, page 27)

FL. 2-40
Smoking/Picnic Shelter

High Visibility Use
in Living/Training,
Industrial, and
Tenant Facilities Areas: Attached
Designed and constructed of materials to coordinate with the permanent building
(See FL. 2-41)
(See also, page 27)

FL. 2-41
Smoking/Picnic Shelter

(See FL. 2-42 Landscaping/Site Furnishing Matrix)

Item	Visual Zone							Application
	GW	LT	CS	IA	TF	FH	OS	
Sidewalk Railing		●						As required
Trash Receptacles								
A. Metal Receptacle, Utilitarian Design		●	●	●	●	●	●	A. General use - near seating areas
B. Metal Receptacle, Formal Design		●	●		●			B. Areas of high visibility
Benches								
A. Wood Curvilinear Form with Metal Supports	●	●	●		●	●	●	A. General use throughout, especially in areas of public use
B. Backless Wood Bench, Metal Supports		●		●	●			B. Other less visible areas, especially in training areas
Picnic Table						●	●	Recreational areas
Storage Shed		●	●	●	●	●	●	As required
Smoking/Picnic Shelter								
A. Gazebo		●	●	●	●		●	A. General use - near WWII buildings
B. Detached		●	●	●	●			B. Areas of high visibility - near permanent facilities
C. Attached		●	●	●	●			C. Areas of high visibility - as part of permanent facilities

FL. 2-42 ***Landscaping/Site Furnishing Matrix***

Displays:

- Interior: No messages to be placed on doors
  All messages to be placed on bulletin boards
- Exterior: No American flags
  Signs in accordance with the IDG only (See FL. 2-43 Sign Matrix, FL. 2 - 44 A1 - FL. 2 - 46 C2, and FL. 2-47 - FL. 2-51) (further reference - IDG)
  No paint color changes to be made on stairs and railings
  No paint on curbs

Paint Colors:

- Interior: Color Schemes are predetermined by DPW on a building by building, floor by floor, section by section basis.....Do Not Change
- Exterior: Base Color: Eggshell Cream (standard Dryvit color)
  Trim Color: Chocolate Malt (standard Dryvit color)
  Accent Color: Zone Dependent (per zone, as listed):

Housing.....	No accent color
Campus.....	Smokey Blue
Industrial Area.....	Desert Taupe
Community Center....	Rustic Red
Training, Resources, and Development...	Salem Gray
Recreational Area..…	Brite White
Headquarters.....	Golden Yellow
Tenant Activity Area...	Adobe Accent

(See FL. 2-52)

Identification signs are those that state the name of the building or facility at that location.

Directional signs point the way to a destination with an arrow.

Directory signs are those that list a series of destinations within a building or in an area of the post, and may serve as secondary information to an identification sign.

Informational signs convey other general messages such as schedules, policies or regulations.

Mandatory signs carry imperative regulatory messages such as warnings and restrictions; and, must have prior approval from DPW Traffic Review Board. ***Regulatory signs*** **are to be accomplished by DPW only.** ***Overhead Passage signs*** **are to be accomplished by DPW only**

Motivational signs are those that carry inspirational slogans to support training and morale; and, except for 'Army Values' signs, display is limited to 30 days.

Type of Message Required ● Permitted ○ Message Permitted on Secondary Sign Board Only.	Identification Signs	Directional Signs	Directory Signs	Informational Signs	Mandatory/Prohibitory Signs	Motivational Signs
Type of Sign (DC 6.2):						
A1	●					
A2	●					
A3	●					
A4	●					
B1	●	○	○			
B2	●	○	○	●	●	●
B3		●	●			
B4		●	●			
B5	●					
B6	●			●	●	
B7						●
B8					●	●
B9	●				●	
B10		●		●	●	
C1	●					
C2	●					

FL. 2-43 ***Sign Matrix***

To reduce visual clutter, use a sign as small, brief, clear, and concise as possible to adequately do the job.

Signs are to made of .080 guage metal and 3M 3279 Brown Reflective Scotchlite with white reflective Scotchlite lettering and 4” x4” treated wood frames.

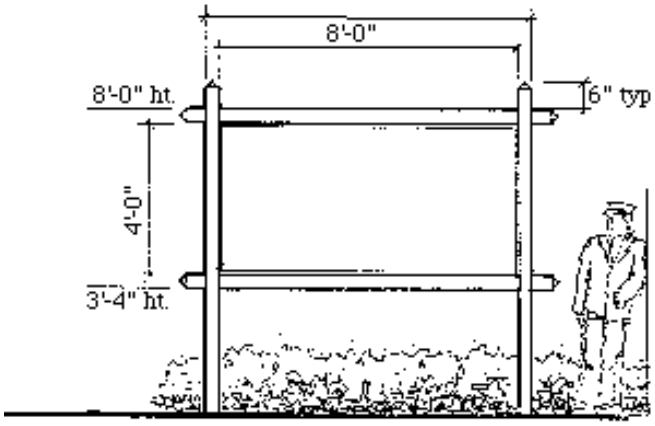
Two typefaces are to be used on the Post signs:
helvetica medium and helvetica regular.

If backside of sign carries no message, it should be 3M 3279 Brown Reflective Scotchlite.

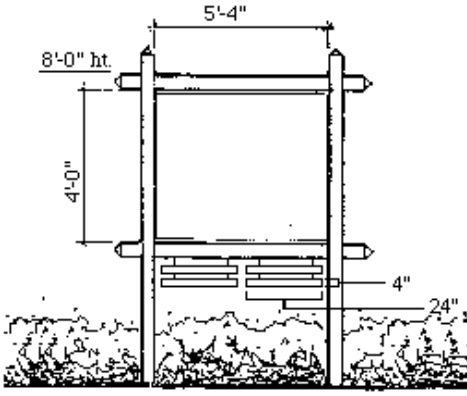
Mounting heights are to be consistent.

See the *Installation Design Guide* (IDG) for further reference.

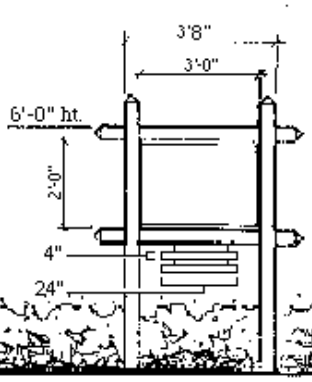
Refer also to TM5-807-10 Signage for additional guidance.



FL. 2-44
A1



FL. 2-44
A2



FL. 2-44
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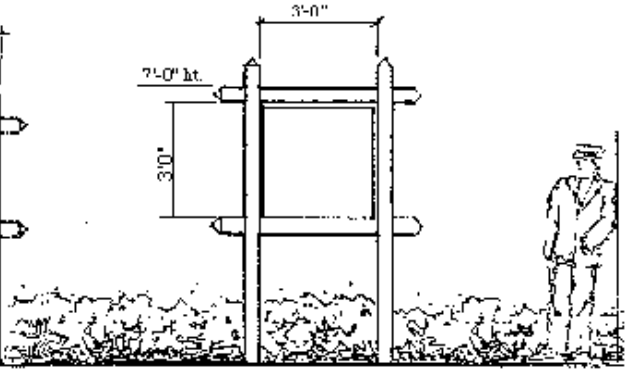
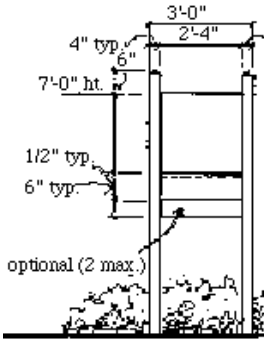
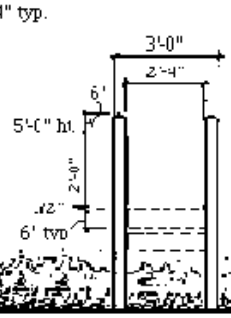


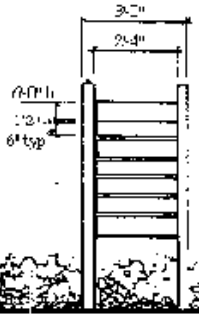
FL. 2-44
A4



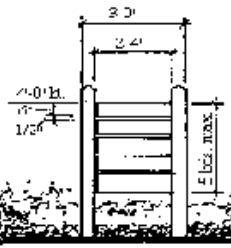
FL. 2-45
B1



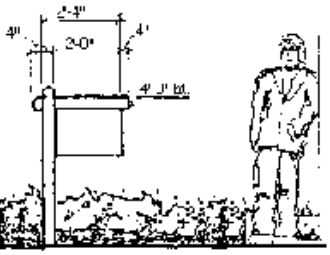
FL. 2-45
B2



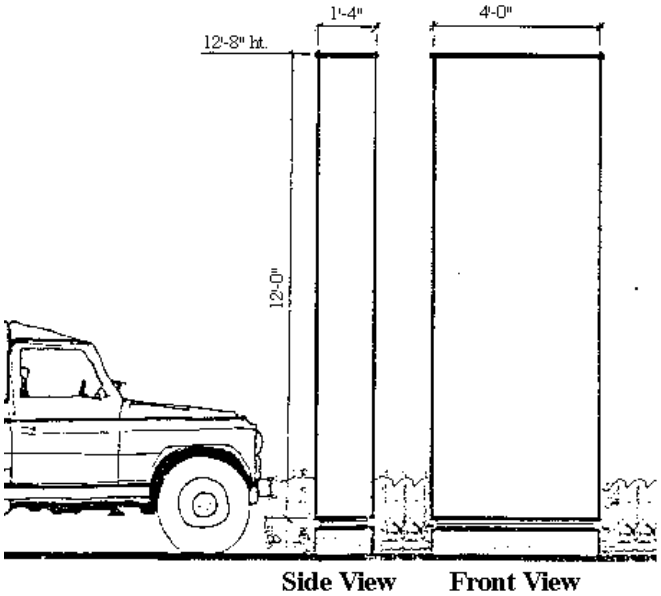
FL. 2-45
B3



FL. 2-45
B4



FL. 2-45
B5



FL. 2-46
C1

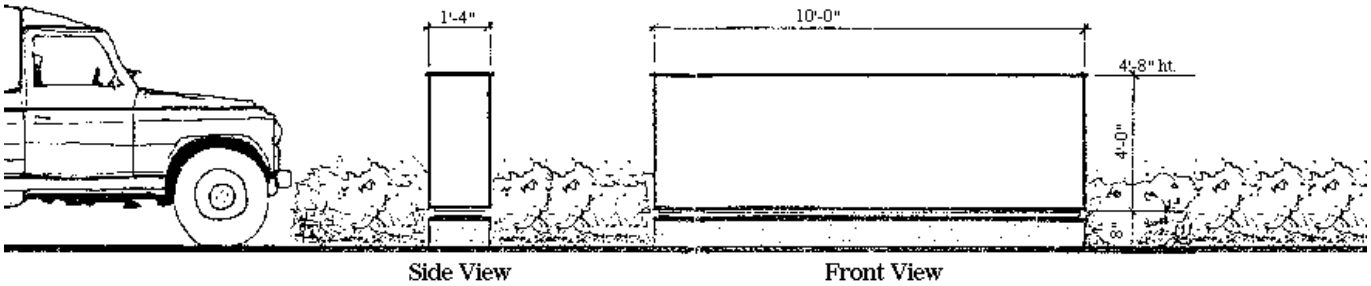
Type A and Type B signs are the post-wide standard. The size and proportion is to be determined by the command level associated with the function identified.

Command Level	Sign Type	Dimensions (w x h)
Maj. Directorate	A2	4'8"x4'0"
Brigade	A2	4'8"x4'0"
Battalion	A2	4'8"x4'0"
Division	A3	3'0"x2'0"
Branch	A3	3'0"x2'0"
Section	A4	3'0"x3'0"
Company	A4	3'0"x3'0"
Subordinate Division	B1	2'4"x2'4"

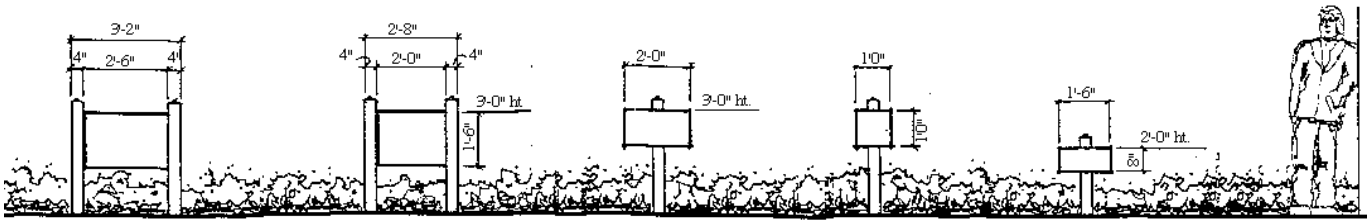
Type C (monumental / pylon signs) are to be used sparingly, not within 500 ft. of each other, for major identification signs which must command attention.

Type C1 should be limited to post identification.

Type C2 may be used to identify important buildings or complexes.



FL. 2-46
C2



FL. 2-45
B6

FL. 2-45
B7

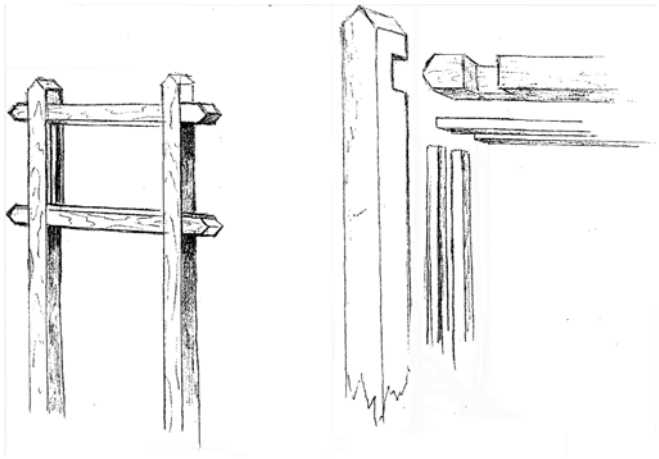
FL. 2-45
B8

FL. 2-45
B9

FL. 2-45
B10

FL. 2-47

An example of a 4x4 post sign.



FL. 2-48

Frame construction: 4"x 4" treated wood cross joined as illustrated, ¾" treated wood strips.

FL. 2-49

Brick sign at Jackson Circle.

FL. 2-50

Brick sign at the NCO Academy.

FL. 2-51

Bronze anodized metal sign at CASCOM.

Open Space
Forested Area
Exterior Paint Colors:
Base Color
Trim Color
Zone
Accent Color
Housing
Campus
Industrial Area
Community Center
Training R & D Area
Recreational Area
Headquarters
Tenant Activity Area

FL. 2-52

*D*o's and Don't's:

Do:

Landscaping in accordance with the **IDG** and **Executive Summary** only:

Don't:

- use landscaping timbers
- paint around bases of trees
- place gravel around bases of trees
- place retaining walls around bases of trees
- use tires as landscaping anywhere

Do:

- place 4" - 6" of mulch and/or flowers around bases of trees

Do:

Site Furnishings in accordance with the **IDG** and **Executive Summary** only:

Don't:

- erect temporary shelters without coordinating with DPW

Do:

- use Lawn Barrier Railings
- use Trash Receptacles
- use Benches and Picnic Tables
- use Smoking/Picnic Shelters
- use Privacy Fence screen

In accordance with the **IDG** and **Executive Summary** only

Do:

Displays in accordance with the **IDG** and **Executive Summary** only:

Don't:

- display personalized logos on buildings or elsewhere unless designed as part of the building sign
- display American flags
- paint stairs and railings
- paint curbs
- place temporary, flashing-light signs anywhere
- place messages on doors

Do

- place messages on bulletin boards
- display Guide Arms flag
- display signs in accordance with the **IDG** and **Executive Summary** only

Do:

Paint in accordance with the **IDG** and **Executive Summary** only:

Don't:

- change interior color schemes of barracks, etc.

Do:

- paint using colors as specified

*D*o's and Don't's:

Do:

Construct building appurtenances in accordance with the **IDG** and **Executive Summary** only:

Don't:

- construct any canopy, screen, gazebo, fence, mechanical screen, etc. without first coordinating the design colors, location, and construction with DPW
- change locks without calling the DPW locksmith to install the proper compatible Best locking system

Do:

- construct mechanical screens with Easi-Set Precast Building or to match the building to which they are adjacent, i.e. brick for brick.
- construct smoking shelters per Fort Lee guidance of:
  - WWII Buildings: gazebo with shingles to match building
  - Permanent Facilities: attached - at non-major entrances, canopies designed of materials to match the building; design integration and material selection are critical
  - Permanent Facilities: detached – shelters to be designed and constructed of materials and colors that match the permanent building, i.e. minimum standard is bronze, anodized aluminum structure with bronze standing seam metal roof, and optional tempered glass infill panels
- screen dumpsters and exterior equipment with landscaping or permanent screen wall constructed of materials to match the building
- use for brick - Lawrenceville 111-A
- use for mortar - gray or buff (Blue Circle 24-A) depending upon area and adjacencies
- use for roofs -
  - WWII Buildings: medium brown fiberglass shingles
  - Permanent Facilities: sloping - bronze, standing seam metal (galvanized steel)
    flat - modified bitumen
- use for signage -
  - WWII Buildings: 4x4 post type of signage (See pages 21-24)
  - Permanent Facilities: brick or bronze anodized metal per designs (See pages 21-24)
- use for plantings - see the IDG's Plant Matrix pages 160-166 for a full listing of recommended trees and shrubs

*D*o's and Don't's:

Do:

Maintain and erect structures within Family Housing Areas in accordance with the **Fort Lee Housing Policy:**

Don't:

- construct storage sheds or privacy screens without first coordinating with DPW for structural stability, code compliance, design & material selection, and placement/ location
- paint wood privacy fences
- attach lawn structures or other outside ornamentation to vinyl siding
- install satellite T.V. dishes on Family Housing units, as they are currently prohibited

Do:

- submit a written request to the Housing Division Office (Bldg. T-1101) requesting permission to erect a storage shed, fence, canopy, privacy screen, or other exterior structure
- adhere to Army Family Housing (AFH) fencing policy which prohibits front yard fencing and establishes rear/side yard fencing to be black chain link (either coated or painted)
- submit a written request to the Housing Division Office (Bldg. T-1101) requesting permission to erect HAM/short wave radio antennas
- vary landscaping designs per individual units
- submit designs for privacy screens/fencing to the Housing Division Office (Bldg. T-1101), especially if they deviate from the Standard 6' high, wood plank fence finished with clear sealer
- utilize suggested plantings contained in the current Housing Resident pamphlet or U-Do It Center

*D*o's and Don't's:

Do:

In general:

Don't:

- construct signage or contract for same without first sending a request to DPW via work request (Form 4283) for approval
- build, construct, renovate, or add-on any structure on-post without first coordinating the design and construction with the Fort Lee DPW @ Bldg. 6205; work orders go to Mr. Ron Allen – 734-4562, and planning, signage, standards issues refer to Mr. John Royster, Master Planner –734-3368

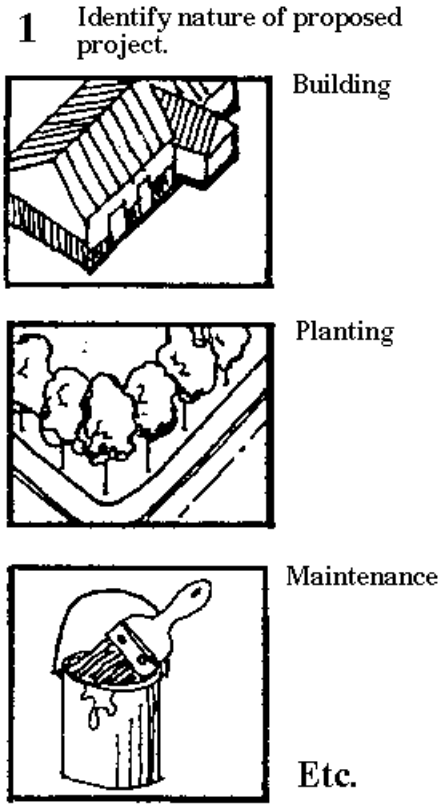
Do:

- access the full Installation Design Guide (IDG) on the Fort Lee Network shared files by PC, or come by the Fort Lee Master Planning Office @ Bldg 6205, Shop Rd. to view the complete hard copy of installation standards
- all self help/U-Do-It requests must be approved by DPW for code compliance, structural integrity, aesthetics, and building systems compatibility
- when in doubt, contact the Fort Lee Housing Office or Directorate of Public Works for guidance on standards and approvals

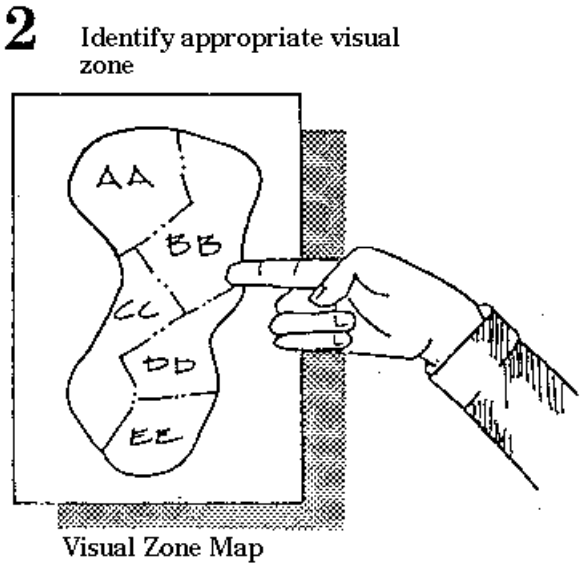
3.0 Preface

i

3.1. How to Use This Document



FL. 3-1



FL. 3-2

3.1.1. Intended Use of the IDG

The Fort Lee Installation Design Guide (IDG) is intended to be used by the DEH staff and/or personnel directly responsible for any design and/or construction programmed at the installation. This document formulates directives to assist the designer in achieving as high a standard of design quality as possible. It is to be used as a component part of the Fort Lee Master Plan and is to be used in conjunction with other more detailed and specific Technical Manuals.

The Installation Design Guide (IDG) is a tool for achieving excellence in installation design. It is a manual which establishes specific design criteria and outlines a program to maintain and enhance Fort Lee's visual assets while correcting visual liabilities. Design guidelines address specific design issues. In general, the scope of the IDG encompasses all significant visual aspects of Fort Lee's exterior physical environment which can be influenced by construction or maintenance.

3.1.2. Implementing the IDG Design Criteria

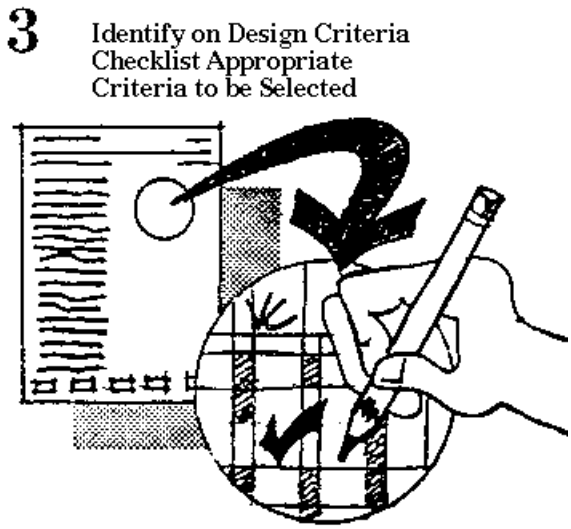
Development of major new facilities, along with numerous smaller improvement projects, represents the opportunity to improve installation design at Fort Lee. These projects bring the resources necessary for physical improvements to Fort Lee, and each step in their planning and design is the very process through which the goal of installation excellence is realized.

This goal cannot be achieved simply on a project-by-project, or problem-by-problem basis without coordination in terms of an overall concept. The built environment of Fort Lee must be carefully nurtured through a masterplanning process which allows each design problem to be resolved as part of a unified conceptual design *theme*.

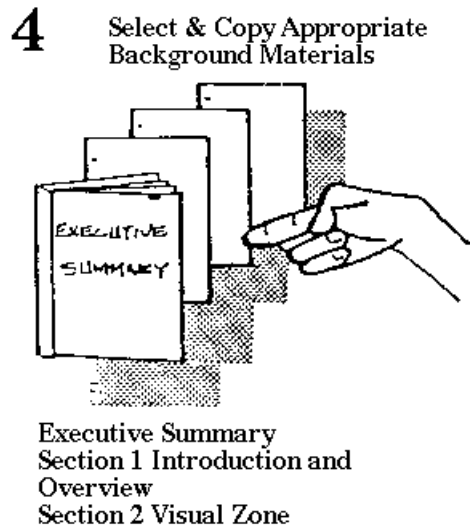
The purpose of the IDG is to provide this theme through *design criteria*. The skill and judgment of the staff member administering these guidelines is essential to the successful planning and design of future projects. The design criteria represent general principles which must be carefully

3.0 Preface

3.1 How to Use This Document



FL. 3-3



FL. 3-4

interpreted and incorporated by the staff member into the particular project in the context of that project's special constraints and opportunities.

The information contained here should be considered a working document requiring updating and revisions. New design criteria and directives should be included as they become operative. The success of this design overview effort will be dependent upon how rigorous the staff member is in the enforcement and proper application of these established guidelines.

3.1.3. How to Use this Document

In utilizing the information in this document, it is necessary to first define the nature of the proposed project. (See FL. 3-1) Secondly, the Visual Zone in which the proposed project is located should be identified. (See FL. 3-2) Finally, appropriate Design Criteria related to the proposed project should be selected and put together into a project design package.

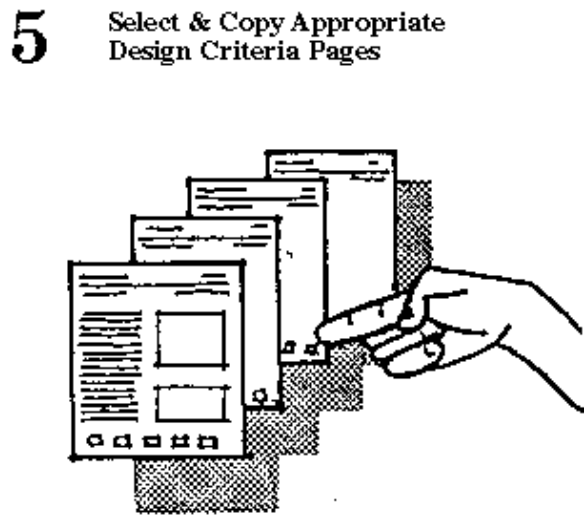
The information in this document is organized in the following manner. An Executive Summary has been prepared as a separate stand-alone document that provides a broad overview of the post's image and goals for achieving an improved visual environment. Section 1 *Introduction and Overview* provides further background on the post's historical context and functional activities. Section 2 *Visual Zones* describes and defines each of the seven visual zones and discusses broad design objectives/recommendations for each zone. Section 3 *Design Criteria* presents detailed design guidelines and criteria for new projects as well as the upgrading and retrofitting of existing development. Section 4 *Projects Documentation* identifies and prioritizes the specific improvement projects that when implemented will have a significant impact on the improvement of the visual environment.

Section 3 *Design Criteria* incorporates the bulk of the design guideline information. The Design Criteria are organized and presented in six broad design categories:

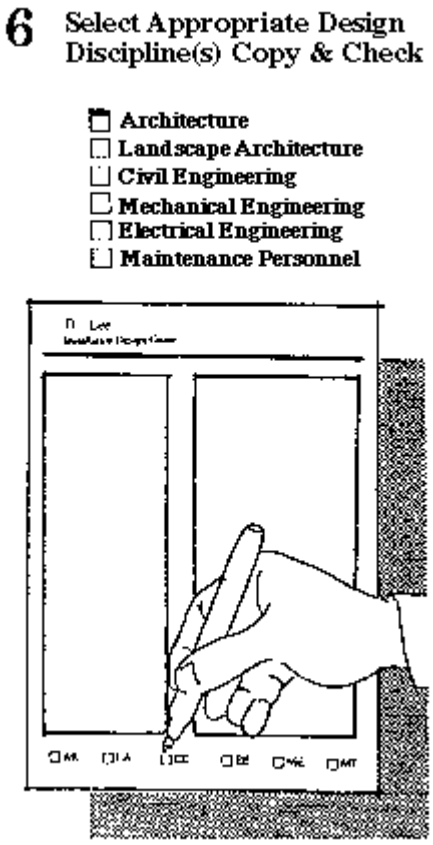
1. Site Planning
2. Architecture
3. Landscape

3.0 Preface

3.1 How to Use This Document



FL. 3-5



FL. 3-6

4. Site Furnishings
5. Lighting and Utilities
6. Signs

The detailed design information in each of these sections is presented in a format that is appropriate to a specific visual zone(s) and specific to a particular design discipline(s). The staff member has the responsibility of identifying the appropriate information to be included in each project design package.

3.1.4. Components of a Project Design Package

After identifying the nature and proper visual zone of the proposed project or maintenance work order, the staff member should proceed to select and copy the appropriate Project Design Package materials. These would include:

1. Background Materials

If the project is of a large scale and being designed by an outside Architect/ Engineering (A/E) firm unfamiliar with this Post, a copy of the Executive Summary, a copy of Section 1 *Introduction and Overview*, and a copy of the pertinent Section 2 *Visual Zone* sheets should be put together for the A/E's general information and reference. If the project is of a smaller scale or being designed by "in-house" staff already familiar with the post, this background material is, obviously, not required. (See FL. 3-5)

2. Design Criteria Checklist

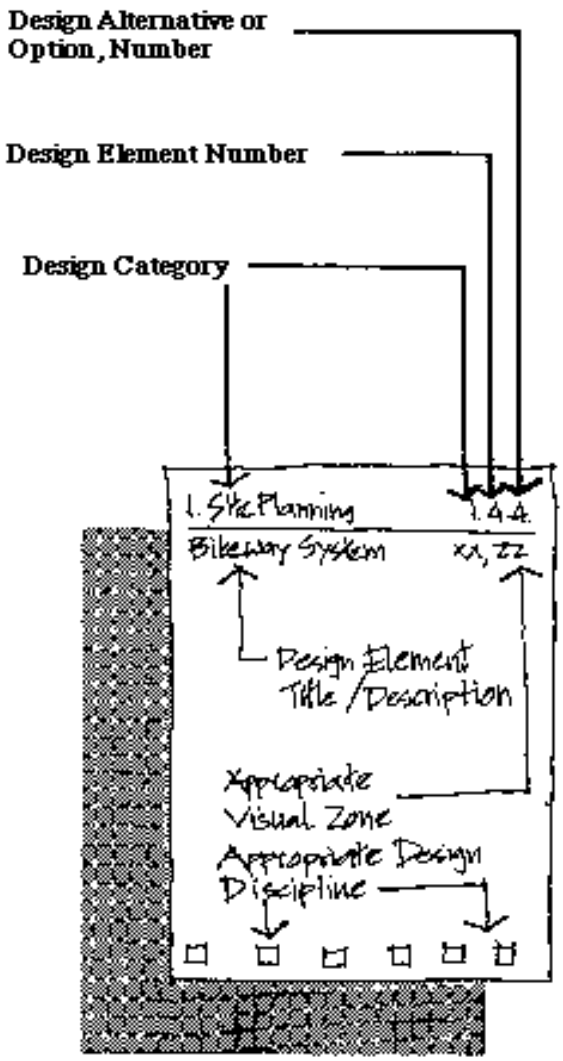
The Design Criteria Checklist (sheet V of the *Preface Section*) should then be copied and the appropriate boxes marked that are pertinent to the proposed project, within the appropriate visual zone, and related to the required design disciplines. On the Checklist two boxes are provided in each Visual Zone. If a Design Criteria Sheet is applicable to that Visual Zone, it will be shaded. The other box should be marked for reference in selecting the Design Criteria (DC) Sheets. (See FL. 3-6)

3. Design Criteria Sheets

The staff member should then turn to Section 3 *Design Criteria* and with the annotated checklist, pull out and copy the appropriate Design Criteria Sheets. Care should be taken to replace all sheets in their proper order and to

3.0 Preface

3.1 How to Use This Document



Typical Design Criteria Page

FL. 3-7

confirm that the Design Criteria are appropriate to the proposed project. Throughout this document, reference is made to Design Criteria Sheets as DC (ie. DC 3.2.6.)

3.1.5. Organization of Design Criteria Sheets

The adjacent illustration describes the organization of information on each page of the Design Criteria. (See FL. 3-7) At the top of the page is a general heading related to the Design Category of the sheet. A further description identifies in more detail the Design Element that the sheet refers to within the broader Design Category. Where alternative approaches or options exist, they are numbered and identified.. At the bottom of the page are six boxes that refer to different Design Disciplines. They are:

AR - Architecture
LA - Landscape Architecture
CE - Civil Engineering
ME - Mechanical Engineering
EE - Electrical Engineering
MT - Maintenance Personnel

The staff member should check the appropriate box for the appropriate design discipline. On any given project, it is likely that a single Design Criteria page could be useful to several different Design Disciplines. It is the responsibility of the staff member to assure that all necessary information in the Project Design Package is complete and appropriate for each of the disciplines.

Reference is made throughout this document to Visual Zones. They are described in detail in *Section 2* of this manual. For reference, the Visual Zone Designations are:

GW Gateway Zone
LT Living/Training Zone
CC Community Center Zone
SS Service & Storage Zone
TF Tenant Facilities Zone
FH Family Housing Zone
OS Open Space Zone

3.0 Preface

3.2 Design Criteria Checklist

Project:
Visual Zone:
Prepared By:

(Page 1 of 2)

1. Site Planning	GW	LT	CC	SS	TF	FH	OS
1.0 Post Environment (2 pages)	■	■	■	■	■	■	■
1.1 Design for Climatic Conditions (2 pages)	■	■	■	■	■	■	■
1.1.1 Existing Roadway Classification	■	■	■	■	■	■	■
1.1.2 Troop Movement & Bikeway System	■	■	■	■	■	■	■
1.2 Building Orientation/Siting	■	■	■	■	■	■	■
1.3 Building Setbacks	■	■	■	■	■	■	■
1.4.1 Roadway Section - Main Gate	■						
1.4.2 Roadway Section - Adams Ave.		■					■
1.4.3 Roadway Section - Saratoga Drive						■	■
1.4.4 Roadway Section - Living/Training		■	■				
1.4.5 Roadway Section - Secondary Roads				■	■		
1.4.6 Roadway Section - Tertiary Roads		■		■	■		
1.4.7 Residential Streets						■	
1.5.1 Troop Movement Spine		■					
1.5.2 Troop Movement Spine		■					
1.5.3 Troop Movement Spine		■					
1.5.4 Troop Movement Pathway		■	■	■			■
1.5.5 Troop Movement Pathway						■	■
1.5.6 Bike Path	■	■	■	■	■	■	■
1.5.7 Bikeway System - Details	■	■	■	■	■	■	■
1.6.0 Access to Buildings (2 pages)	■	■	■	■	■	■	■
1.6.1 Access to Buildings - Rear Parking	■	■	■	■	■	■	■
1.6.2 Access to Buildings - Side Parking	■	■	■	■	■	■	■
1.6.3 Access to Buildings - Front Parking	■	■	■	■	■	■	■
1.7.1 Off-street Parking - Standards	■	■	■	■	■	■	■
1.7.2 Off-street Parking/Small Lots	■	■	■	■	■	■	■

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3.2 Design Criteria Checklist

Project:
Visual Zone:
Prepared By:

(Page 2 of 2)

1. Site Planning Cont.----------	GW		LT		CC		SS		TF		FH		OS	
1.7.3 Off-street Parking----------	■		■		■		■		■		■		■	
1.7.4 Off-street Parking - Pedest. Pathway----------	■		■		■		■		■		■		■	
1.7.5 Off-street Parking - Planted Islands----------	■		■		■		■		■		■		■	
1.8 Formal Open Space----------			■						■					
1.9 Warehouse & Storage Yards----------							■							
1.10 Review Stands----------			■											
1.11 New Family Housing----------											■			
1.12 Drainage Lawn Areas (2 pages)----------	■		■		■		■		■		■		■	

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3.2 Design Criteria Checklist

Project:
Visual Zone:
Prepared By:

(Page 1 of 2)

2. Architecture	GW		LT		CC		SS		TF		FH		OS	
2.0 General Notes (3 pages)	■		■		■		■		■		■		■	
2.1.1 Massing Large Buildings	■		■		■		■		■		■		■	
2.1.2 Massing Single Story Bldgs.	■		■		■		■		■		■		■	
2.1.3 Massing of 2 & 3-Story Bldgs.	■		■		■		■		■		■		■	
2.1.4 Building Height	■		■		■		■		■		■		■	
2.1.5 Articulation Tall Buildings	■		■		■		■		■		■		■	
2.2.1 Design Character - Traditional Brick			■											
2.2.2 Design Character - Traditional Non-Brick									■					
2.2.3 Design Character - Officer's Club					■									
2.2.4 Design Character - Contemporary Brick	■		■		■				■					
2.2.5 Design Character - Contemporary Brick			■		■									
2.2.6 Gatehouse	■													
2.2.7 Contemporary Stucco & Brick			■		■		■							
2.2.8 Contemporary Stucco & Brick							■		■				■	
2.2.9 Contemporary Stucco & Brick							■		■				■	
2.2.10 Storage Buildings							■							
2.2.11 Reviewing Stands			■											
2.2.12 New Family Housing											■			
2.3.1 Replacement Windows			■											
2.3.2 Replacement Windows			■											
2.3.3 Placement of Windows	■		■		■				■					
2.3.4 Detailing Openings	■		■		■		■		■					
2.4.1 Building Entrance	■		■						■					
2.4.2 Ramps	■		■		■		■		■		■		■	
2.4.3 Barracks Entrances			■											
2.5.1 Securing Existing Openings	■		■		■		■		■		■		■	

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3.2 Design Criteria Checklist

Project:
Visual Zone:
Prepared By:

(Page 2 of 2)

2. Architecture Cont.	GW		LT		CC		SS		TF		FH		OS	
2.6.0 Colors & Materials: General Notes	■		■		■		■		■		■		■	
2.6.1 Colors & Materials: Brick Theme	■		■		■				■					
2.6.2 Colors & Materials: Stucco & Brick Theme			■				■		■				■	
2.6.3 Colors & Materials: Family Housing											■			

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3.2 Design Criteria Checklist

Project:
Visual Zone:
Prepared By:

(Page 1 of 2)

3. Landscape	GW		LT		CC		SS		TF		FH		OS	
3.0 Introduction	■		■		■		■		■		■		■	
3.1.1 Street Tree Planting	■		■		■		■		■		■		■	
3.2.1 Screening Parking: Planting & Berms	■		■		■		■		■		■		■	
3.2.2 Screening Parking: Low Walls			■		■				■		■			
3.2.3 Screening Secured Areas	■		■		■		■		■		■		■	
3.2.4 Sreening Secured Areas - Berm	■		■		■		■		■					
3.2.5 Screening Dumpsters-Masonry Walls			■		■				■					
3.2.6 Screening Dumpsters - Wood Fencing	■		■		■		■		■		■		■	
3.2.7 Screening Dumpsters - Planting	■		■		■		■		■		■		■	
3.2.8 Locating Dumpsters	■		■		■		■		■		■		■	
3.2.9 Screening Remote Toilets							■		■				■	
3.2.10 Screening Mechanical Equipment	■		■		■		■		■		■		■	
3.2.11 Screening Loading Docks			■		■		■		■					
3.2.12 Motor Pool Entrance	■		■				■		■				■	
3.3.1 Plazas & Courtyards			■		■				■					
3.3.2 Plazas & Courtyards			■		■				■					
3.3.3 Planting - Building Entrances			■		■		■		■					
3.3.4 Barracks Area			■											
3.3.5 Barracks Entrances			■											
3.4.1 Troop Barracks Grounds			■											
3.4.2 Troop Mustering/Parking Lots			■				■		■					
3.4.3 Troop Crossings	■		■		■		■		■		■		■	
3.4.4 Troop Movement Pathways	■		■		■		■		■					
3.4.5 Troop Movement Spine			■											
3.4.6 Parade Ground			■						■					
3.5.1 Landscape Improvement											■			

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3.0 Preface

3.2 Design Criteria Checklist

Project:
Visual Zone:
Prepared By:

(Page 2 of 2)

3. Landscape Cont.	GW		LT		CC		SS		TF		FH		OS	
3.5.2 Rear Yard/Patio Treatment											■			
3.5.3 Landscaping in Proximity to Buildings	■		■		■		■		■		■		■	
3.5.4 Management of Forest Edge	■		■		■		■		■		■		■	
3.6 Planting Matrix (8 pages)	■		■		■		■		■		■		■	
3.7 Paving Matrix (2 pages)	■		■		■		■		■		■		■	

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

3.2 Design Criteria Checklist

Project:
Visual Zone:
Prepared By:

4. Site Furnishings	GW		LT		CC		SS		TF		FH		OS	
4.1 Site Furnishings Matrix (3 pages)	■		■		■		■		■		■		■	
4.1.1 Benches (See Furnishings Matrix)	■		■		■		■		■		■		■	
4.1.2 Seating	■		■		■		■		■		■		■	
4.1.3 Bollards	■		■		■		■		■		■		■	
4.1.4 Bollards	■		■		■		■		■		■		■	
4.1.5 Trash Receptacles	■		■		■		■		■		■		■	
4.1.6 Fencing	■		■		■		■		■		■		■	
4.1.7 Fencing	■		■		■		■		■		■		■	
4.1.8 Phone Booths/Bus Shelter	■		■		■		■		■		■		■	
4.1.9 Flagpoles/Pennant Holder	■		■		■		■		■		■		■	
4.1.10 Drinking Fountains	■		■		■		■		■		■		■	
4.1.11 Bikerack	■		■		■		■		■		■		■	
4.2.1 Bench/Sidewalk Application	■		■		■		■		■					
4.2.2 Bus Shelters Application	■		■		■		■		■		■			
4.2.3 Relationships Building/Open Spaces			■		■				■					
4.2.4 Relationships Plaza/Courtyards			■		■				■					
4.2.5 Seating Plazas/Courtyards			■		■				■					
4.2.6 Recreation/Picnic Areas													■	
4.2.7 Lawn Barrier Rail			■											
4.2.8 Battalion Monuments			■											

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

3.2 Design Criteria Checklist

Project:
Visual Zone:
Prepared By:

5. Lighting & Utilities	GW	LT	CC	SS	TF	FH	OS
5.0 Introduction (3 pages)							
5.1 Light Matrix							
5.2 Light Fixtures							
5.3 Light Fixtures							
5.4 Light Fixtures							
5.5.0 Locating Overhead Lines							
5.5.1 Roadway Lighting							
5.5.2 Parking & Pedestrian Lighting							
5.6 Utilities Matrix							

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

3.2 Design Criteria Checklist

Project:
Visual Zone:
Prepared By:

6. Signs	GW	LT	CC	SS	TF	FH	OS
6.0 General Notes							
6.1 Signs Types and Dimensions (2 pages)							
6.2.1 Types and Dimensions: Type A							
6.2.2 Types and Dimensions: Type B & C							
6.3.1 Materials & Fabrications; Type A & C							
6.3.2 Materials & Fabrications; Type B							
6.3.3 Materials & Fabrications; Type B							
6.4 Typography							
6.5 Colors							
6.6.1 Sign Layout Type A							
6.6.2 Sign Layout Type B							
6.6.3 Sign Layout Type B							

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Section 1 Introduction

Section 1

Introduction

4.0 Introduction and Overview

FL. 4-1

Mifflin Hall is one of the first buildings seen by visitors to Fort Lee.

4.1.Existing Activities and Facilities

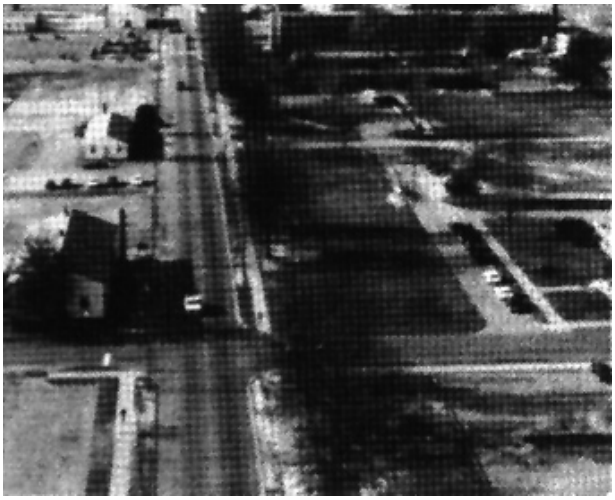
Fort Lee as a TRADOC installation is charged with the responsibility of training the Army of tomorrow and serves as the home of the Quartermaster Corps.

The most actively used area of the post is the crescent-shaped area, extending along Adams, Byrd and Carver Avenues from 1st Street through Lee Avenue to 34th Street. The dominant activity here is the Advanced Individual Training Programs for the Quartermaster Corps. For these soldier -trainees the Fort Lee experience centers around the barracks areas, where they live for six to eight weeks. Drills, mustering, and physical training exercises take place on the grounds surrounding the barracks, while shop and classroom training areas are located immediately across Adams Avenue along Mekong and Shop Roads. The nearby woodlands of the Bailey Creek Valley are used for some training exercises, while other field training is held in the range areas north of Route 36 or within the Tenant Campus in the 38th street area. The troops commute frequently between these areas both by foot and in transport vehicles.(See FL. 4-1)

While the southern crescent area is primarily dedicated to Quartermaster Corps training and relatively short-term residency, the northern crescent area includes the Kenner Army Hospital and barracks for permanent personnel. The wooded parkland of the Historic Petersburg Battlefield lies just across Adams Avenue from these barracks and provides areas for personal recreation and physical exercise (particularly for distance runners). Athletic fields are clustered in the open space flanked by barracks at 33rd Street or located in the meadows on the edge of the parkland across Adams Avenue.

Other facilities in this area include a cluster of small temporary service buildings to the west of Mahone Avenue. The motorpool area at 30th Street separates the two clusters of barracks along Adams and Byrd Avenues and is somewhat unrelated to these residential functions. Finally, a motel facility for visiting personnel is located east of Mahone Avenue on the edge of the wooded stream valley.

4.0 Introduction and Overview 2



FL. 4.2
Aerial View of Adams Avenue.

Through the center of the crescent area runs Lee Avenue creating a formal axis extending from the main gateway to the Officers Club. Formal lawns, parade grounds and athletic fields flank Lee Avenue and make this area the central ceremonial open space of the post.

The Post Exchange and a cluster of other related support facilities make up the Community Services Center. These are located within the general area of the crescent. This central location makes these community facilities easily accessible from the barracks within the crescent, as well as from nearby family housing neighborhoods. The center is active throughout the day, functioning much like a commercial shopping center. Both vehicular and pedestrian traffic is significant and parking demand is high.

Several tenant facilities are located in an area separated by the wooded stream valley. The Logistics Center is the most highly visible, located on Adams Avenue at Saratoga Drive. It is functionally related to conference facilities across Adams Avenue and to barracks on Carver Avenue. The Logistics Center building has the image of a corporate office/research facility on a suburban site. (See FL. 4-2)

Still other facilities are located in a large area composed of streets in a rigid grid pattern between 38th and 41st Streets south of Adams Avenue. The most significant of these is the Petroleum School with classroom buildings and field training equipment located at the southern end of the area. The street pattern and remaining temporary buildings are here as a result of past wartime development programs, which in some cases causes siting problems for current facilities. However, the area enjoys an abundance of tall mature pines. As the last of the older frame structures are removed, open development sites will be created for future planned facilities.

The family housing areas are organized much like suburban neighborhoods. All the activities of family life take place here, with children playing in the yards or riding bicycles along the sidewalks and streets. All but one of these neighborhood areas are set off from the rest of the main

4.0 Introduction and Overview

FL. 4-3
Troops at Camp Lee circa WWI.

cantonment by the Bailey Creek Valley, and surrounded by woodland. A hill top neighborhood center provides a community focus at Saratoga and Battle Drives with athletic fields, children's playground, chapel, meeting rooms and day care services. (See FL. 4-3)

4.2.Future Development Plans

Fort Lee was designated a permanent installation in 1950. Facilities designed and built for long term use have been gradually replacing "temporary " WWII era frame structures. Fort Lee tends to be a forward-looking installation where on-going and new development will have a greater impact on the visual image of the post than the existence of historic structures.

Most of the planned facilities at Fort Lee are related to the Quartermaster Corps training activities and are, therefore, sited along the southern crescent area from 1st to l9th Streets. Nearly all the area from 1st to 11th Streets will be redeveloped. An in-processing center will be developed at 1st Street and will involve a major renovation of the "blockhouse" building, as well as other new and renovated buildings nearby. A complex of new training buildings will be developed between 3rd and 5th Streets, including barracks, dining facilities, classroom buildings and support functions. Six barracks buildings, each to house about 360 persons, are planned for the area between 6th and 11th Streets. Dining halls are also to be sited in that area, and a major teaching facility is to be located directly across Adams Avenue. The area from 16th to l9th Streets is to be developed with four large training buildings. The first of these, for food service training, is now completed.

A new 6th street entrance is to be developed in coordination with a grade-separated intersection linking the new Route 144 (Temple Avenue) with Route 36. In the Service/Support area west of 6th Street, the motorpool is to be reorganized and consolidated, and a major medical supply warehouse is to be built near 11th Street.

4.0 Introduction and Overview

In the south crescent-shaped area, additional Unaccompanied Officers Quarters are to be developed at Mahone and Carver Avenues and recreational facilities are planned south of 34th street.

Expansion of the Logistics Center is planned to the southeast of the existing building, requiring the realignment of Saratoga Drive at the 41st Street intersection. Various other tenant facilities are planned throughout the 38th/41st Streets area at the Petroleum School. The Installation Plan also allows for expansion in the PX area. These plans indicate that a few key areas are likely to experience concentrated development. They are:

° North Crescent Area
° Sixth Street Gateway Area
° Tenant Campus Area

As a result of this new development, the visual environment of Fort Lee will be significantly changed. As the plans for these new facilities progress, all aspects of their design should be closely coordinated through the application of design criteria in the IDG.

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Section 2

Visual Zones

5.0 Visual Zones 1

5.1. Introduction GW LT CC SS TF FH OS

5.1.1. General Definition

Seven discernable visual zones have been identified for the organization of the Fort Lee environment. Often a specific type of activity or land use is what distinguishes one zone from another; however, a visual zone encompasses an area larger than one single land use reservation and is defined by the positions of buildings, roadways and landscape elements. (See FL. 5-1) As a result, the land-use subdivisions that occur within the Reservation Plan are not perceived as visual entities in reality. In these cases, to achieve a visual sense of orderliness, facility design must be coordinated for the entire visual zone. For this reason the design criteria of the IDG are presented according to their visual zone appropriateness. In the following Visual Zone Map, the seven Visual Zones that encompass Fort Lee are graphically defined. (See FL. 5-2)

On the following pages are described the character of each visual zone. In addition, general design goals, objectives and recommendations are outlined for each zone. These goal statements form the basis for the specific design guidelines which follow.

The Design Guidelines and Criteria that follow have been organized based upon broad design disciplines (i.e., 1. Site Planning, 2.Architecture, 3. Landscape, 4. Site Furnishings, 5. Lighting and Utilities, 6. Signage); their appropriateness is referenced for each Visual Zone.

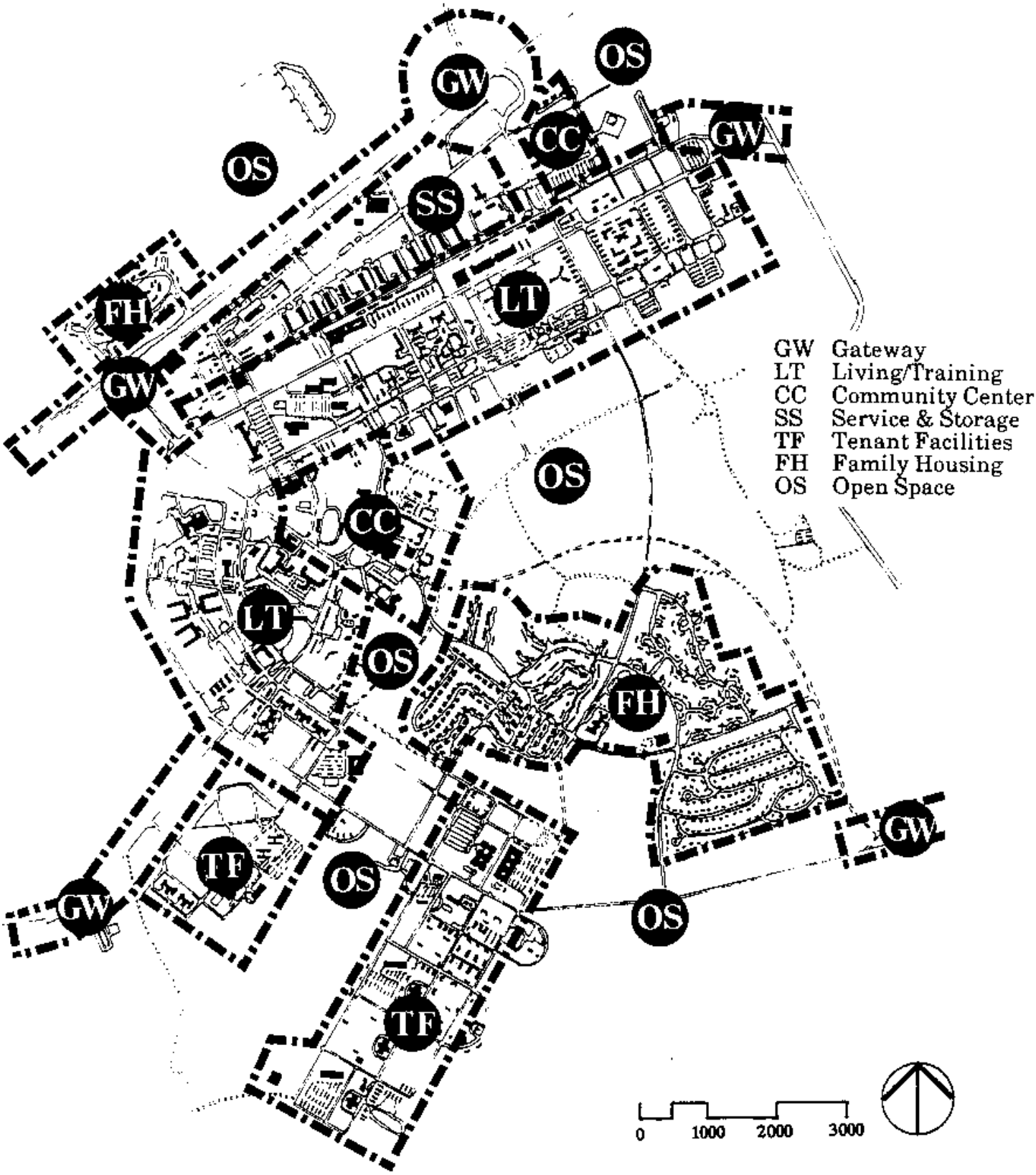
FL. 5-1

Troop movement is highly visible in the Living-Training Visual Zone.

5.0 Visual Zones 2

5.1 Introduction

GW LT CC SS TF FH OS



FL. 5-2 Visual Zone Map

5.0 Visual Zones 3

5.2 Gateway Zone GW

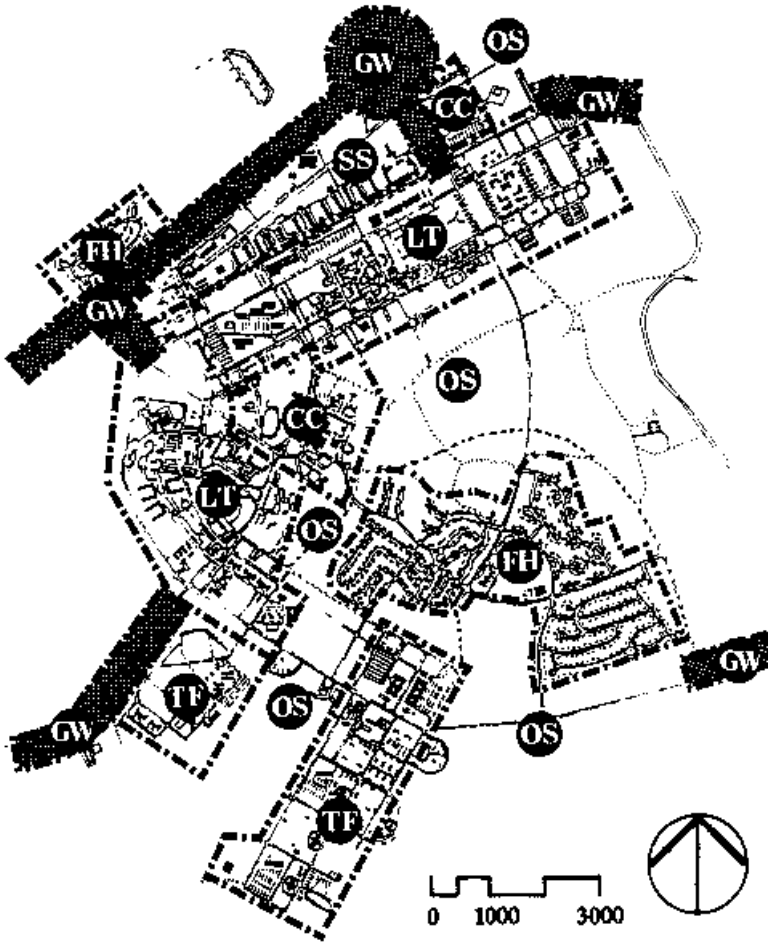
5.2.1. Zone Description

Fort Lee's two primary gateways at 6th Street and Lee Avenue make Route 36 the "front door" to the post. The forested edges along both sides of Lee Avenue are a major asset and give this section of Route 36 a distinctive institutional image, in contrast to the strip commercial development east and west of the post. However, the potential advantage of visual screening provided by the tall loblolly pines has been compromised because the natural understory growth has not been allowed to develop. As a result, service buildings and storage yards are visible from the highway and entrance roads. (See FL. 5-3)

The goal of the design criteria in this area is to enhance the natural forested edge as a visual buffer and develop a 6th Street gateway boulevard with forested buffer areas to either side. The new grade-separated intersection planned for 6th Street and Route 36 provides the opportunity for major improvements in that area. Adjacent service buildings, motor pools and storage yards should be sited to allow for a generous buffer zone of trees which will screen views and frame the entrance boulevard and elevated ramps. The entrance treatment should extend to Adams Avenue preserving the existing forested area at Shop Road.

The positive image of Fort Lee's secondary entrances at Mahone Avenue, Adams Avenue, and Shop Road gates is also largely due to the rich natural forest areas flanking the roadways. New improvements to the gate houses, median and lighting will contribute to this image. While preserving the forested edge, these entrances should be enhanced by coordinated directional signage, as well as landscaping and military monuments where appropriate.

GW Gateway
LT Living/Training
CC Community Center
SS Service & Storage
TF Tenant Facilities
FH Family Housing
OS Open Space



FL. 5-3

5.0 Visual Zones 4

5.2 Gateway Zone GW

5.2.2. Design Recommendations

1. Develop the new 6th Street gate with a street crossection similar to Lee Avenue, featuring a landscaped median, and stands of loblolly pines on both sides of the roadway. Maintain 200 ft. setbacks on both sides of roadway for both fences and buildings; 50 ft. setback for parking areas (other than fenced motor-pools). Provide adequate directional and identification signage in accordance with sign design criteria. Sentry station to be in accordance with design criteria.

2. Upgrade Shoppette building and parking area by providing additional planting between Route 36 and parking area. Reorganize service loading area and parking layout. Building improvements to include painting and window replacement.
   (See FL. 5-4)

3. Allow understory growth to develop within the stands of loblolly pines along the Route 36 edge. Add plantings of indigenous species to develop a natural edge of growth that will screen the view of the warehouses from the public highway.

4. Provide post identification signs of appropriate design at each primary and secondary gate. See Sign Design Criteria.

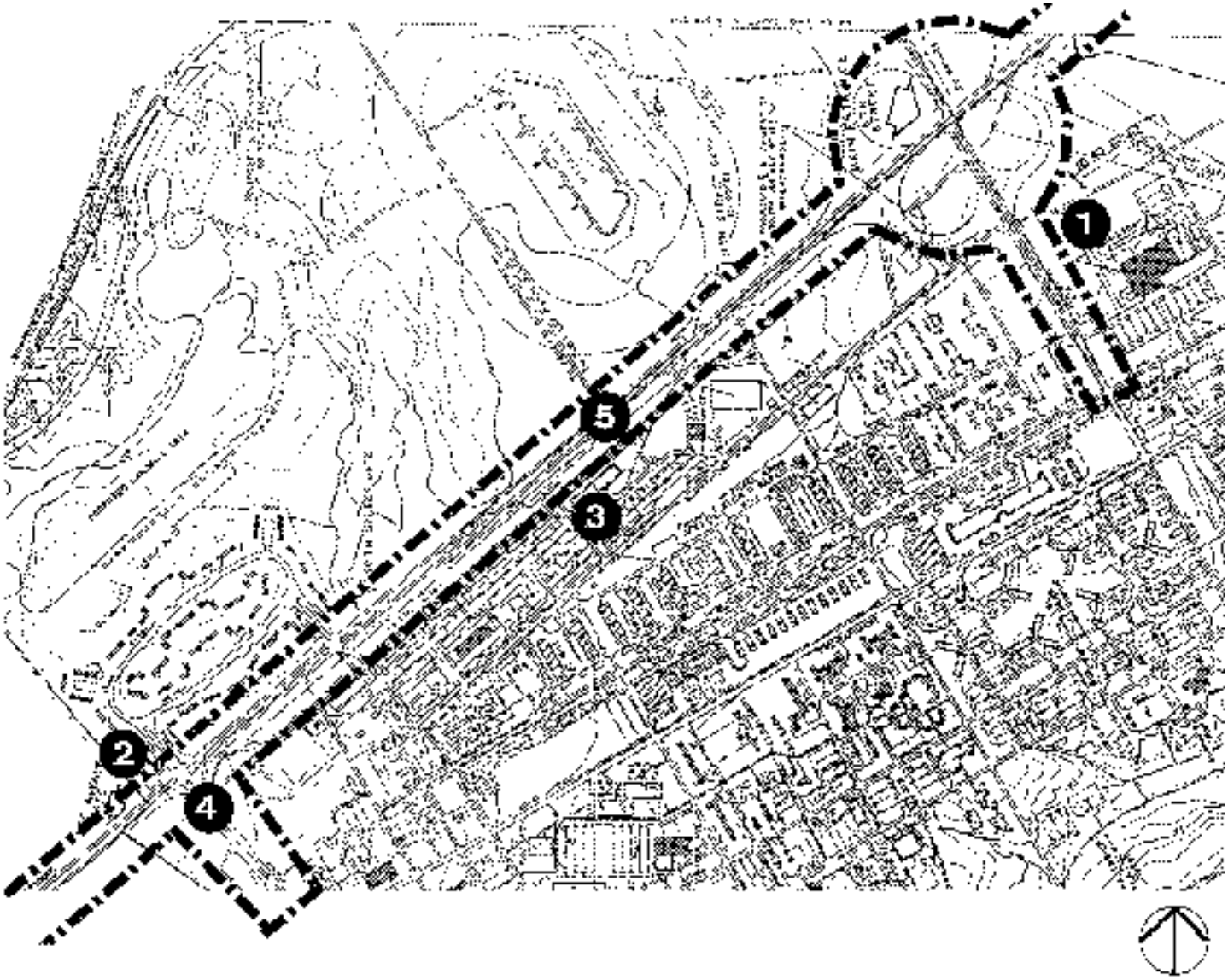
5. Provide special highway treatment at major troop crossing points along Route 36. as part of the overall troop pathway system. See DC 3.4.3.

5.0 Visual Zones

4a
(Supplemental)

5.2 Gateway Zone

GW



FL. 5-4

Gateway Zone Map (Route 36)

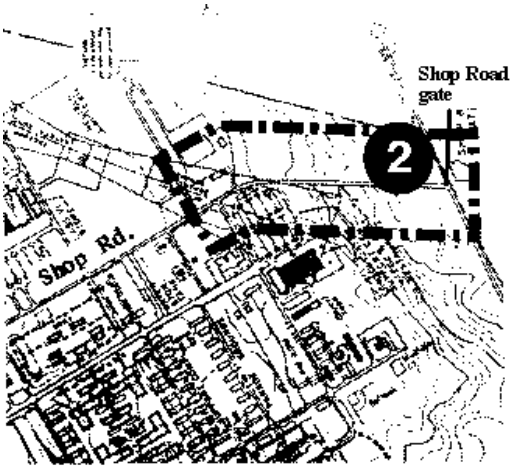
5.0 Visual Zones 5

5.2 Gateway Zone GW

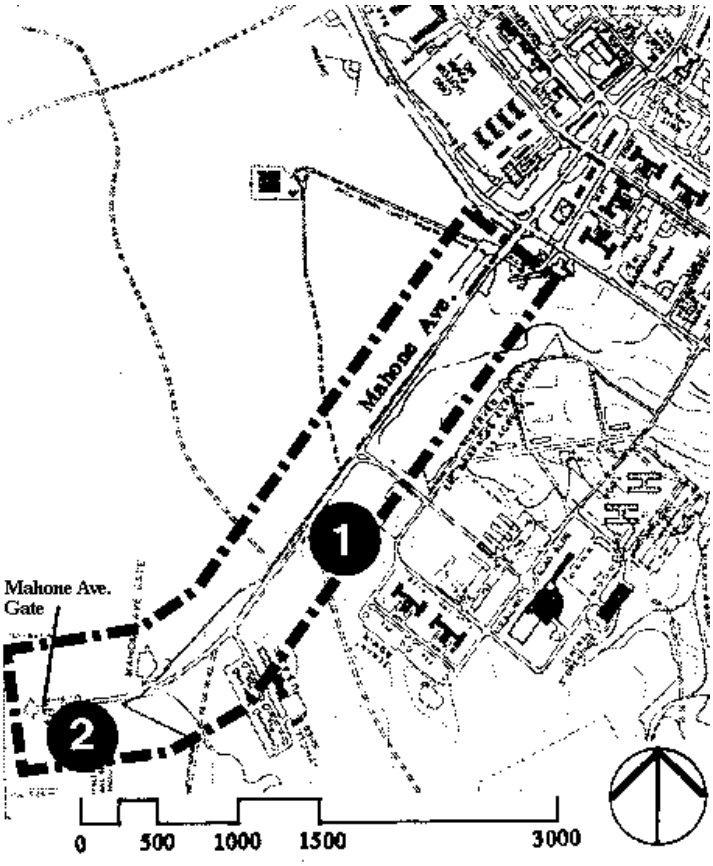
5.2.2.1. Gateway Zone Recommendations

1. Improve the appearance of Mahone Avenue from the gate to Adams Avenue by consistent curbing grading and landscaping along the roadway. Correct misalignments of curbs and embankments.
   (See FL. 5-6)

2. Provide post identification signs of appropriate design at each primary and secondary gate. See Sign Design Criteria.
   (See FL. 5-5 and FL. 5-6)



FL. 5-5
Gateway Zone Map (Shop Rd.)



FL. 5-6
Gateway Zone Map (Mahone Ave.)

5.0 Visual Zones 6

5.3 Living / Training Zone LT

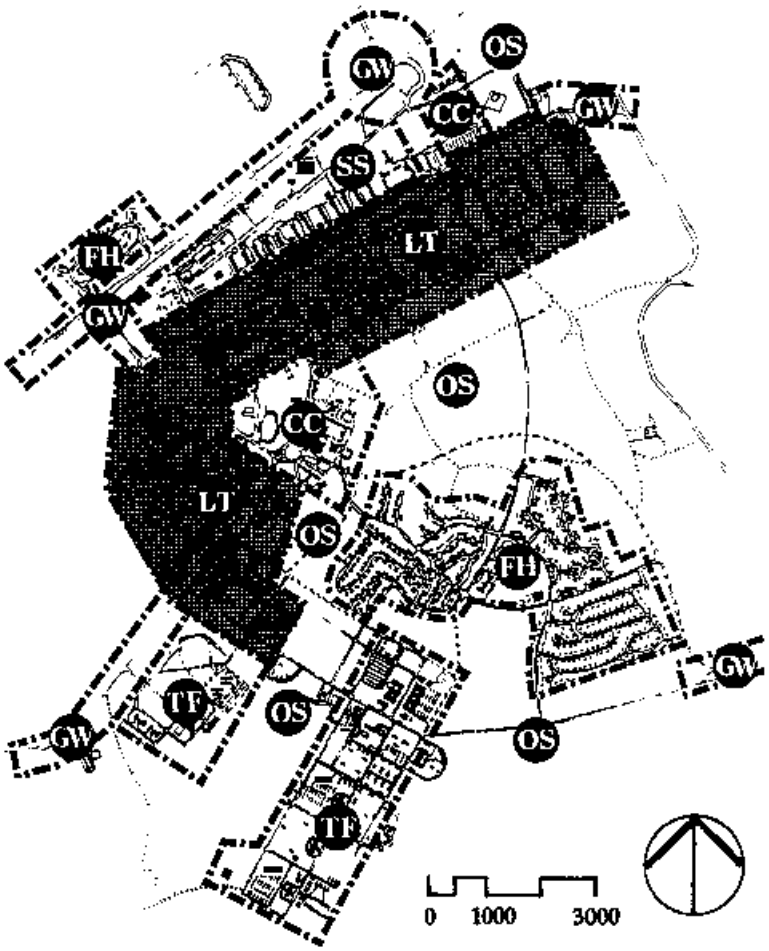
5.3.1. Zone Description

Most of the main cantonment crescent-shaped area is dedicated to barracks and training facilities related to the Quartermaster Corps Advanced Individual Training (AIT), the hospital, or permanent personnel. These training functions are the most significant activities of the post, and indeed the most highly visible. If any single visual zone represents the essential image of Fort Lee it is this campus-like environment of the living/training areas.(See FL. 5-7)

The strong spatial organization of the area is one of its assets. Adams Avenue forms a clear vehicular spine, providing a linear orientation. However, remnant street patterns relating to grids of temporary buildings which no longer exist cause problems in site planning for future development. Byrd and Carver Avenues are somewhat redundant as through streets and unnecessarily channel vehicular traffic through local areas.

With the removal of the temporary buildings, this area provides some of the best sites for future development. It presently has a rather barren image, with sparse and inconsistent planting along the roadways and among the buildings. The most important asset for this area is the large amount of future development planned within it. These developments will provide the opportunity to significantly improve the area's image.

GW Gateway
LT Living/Training
CC Community Center
SS Service & Storage
TF Tenant Facilities
FH Family Housing
OS Open Space



FL. 5-7

5.0 Visual Zones 7

5.3 Living / Training Zone LT

5.3.1. Zone Description (Con't)

The visual character which is anticipated in the future must be clearly understood now, and carefully coordinated through a site development concept plan which encompasses the entire visual zone.

To reduce roadway redundancy, and to reinforce the image of the area as a troop training campus, Byrd Avenue should be converted to a troop movement and pedestrian circulation spine. As such it would link together all living/training activities within the crescent area. This spine should be appropriately paved and landscaped to provide a linear focal space for pedestrian movement, as well as for group activities such as troop mustering, parading, and everyday physical training exercises. This linear spine should be the focus of the living/ training campus area, and buildings should be oriented to emphasize this focus. Vehicular access to buildings lying between Adams and Carver Avenues should be organized so that traffic across the Bryd Avenue spine is minimized. When minor cross traffic is required, the pedestrian should have the right-of-way and the spine treatment should be carried across the road. Parking areas should be kept close to Adams and Carver Avenues. These roads will become the major vehicular circulation routes.

5.0 Visual Zones 8

5.3 Living / Training Zone LT

5.3.2. Design Recommendations

1. Convert Byrd Avenue to a central troop movement spine. This is to be the military version of a pedestrian mall suitable for marching companies of soldiers in formation through the center of the barracks area. Redirect vehicular traffic onto Adams and Carver Avenues. Allow only local service traffic into barracks vicinity to minimize conflicts between through traffic and troop movements. (See FL. 5-8)

2. Upgrade Adams Avenue as the major arterial street extending the length of the crescent-shaped main cantonment. Adams should be a boulevard-like road, linking together all the major functions of the post. Each major facility should be identified with directional signage along Adams A-venue. Other streets are to be utilized for more local traffic. Troop crossings are to be provided at major crossing points as part of the troop movement network. (See FL. 5-8)

3. Remove unnecessary roads wherever current development plans do not require them for access. Consolidate traffic flow on the remaining upgraded streets. Discourage through traffic on roadways other than Adams, Saratoga, Lee, 6th and Mahone. Remove unnecessary cross streets to allow for larger contiguous sites for future development. (See FL. 5-8)

4. Upgrade barracks grounds with landscaping, paving and site furnishings to better support the intense troop activities there. (See FL. 5-8)

5. Develop a comprehensive troop movement pathway system, linking troop barracks with major training activity areas, such as the warehouses, range area, petroleum school and field training areas. Byrd Avenue should be the focus of this network. (See FL. 5-8)

6. New barracks should be designed according to the architectural design criteria (see Section 2, Architecture). Develop an overall detailed site master plan to coordinate the siting of all new buildings within this complex. (See FL. 5-8)

7. Remove deep open drainage ditches. Provide site drainage through either shallow swales or inlets and underground pipes. These improvements are to be part of a post-wide storm-water management plan. (See FL. 5-8)

8. Where strong orthagonal street pattern exists, orient new structures square with street grid. See DC 1.2. (See FL. 5-8)

9. Maintain the natural edge of the forest. Minimize removal of trees where new development is planned along south side of Carver Avenue. SeeDC3.5.4. (See FL. 5-8)

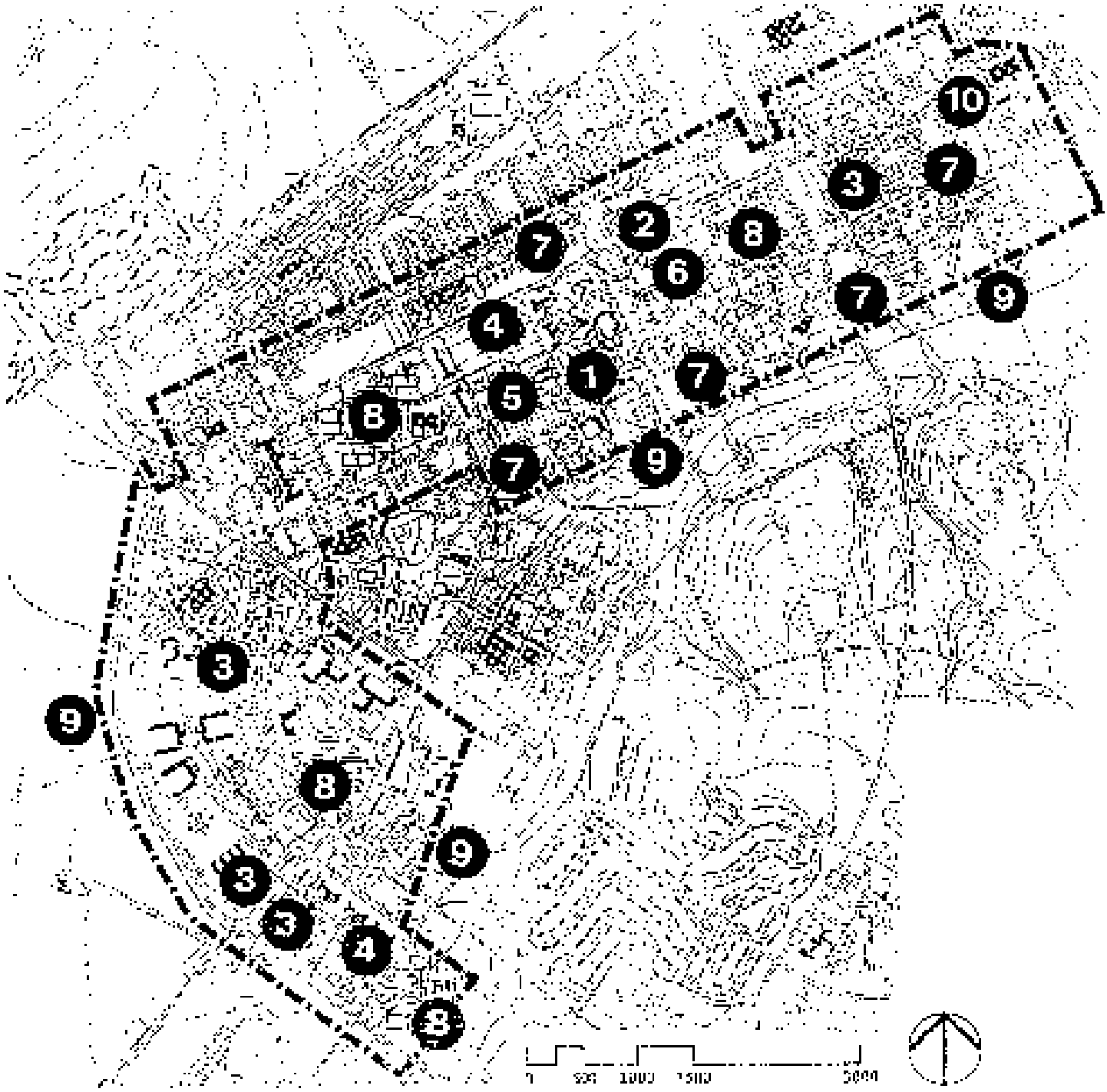
10. Parade ground planned for lst-2nd Street area is to be framed with a double row of canopy trees. See DC 3.4.5. (See FL. 5-8)

5.0 Visual Zones

8a
(Supplemental)

5.3 Living / Training Zone

LT



FL. 5-8
Living / Training Zone Map

5.0 Visual Zones 9

5.4 Community Center Zone CC

5.4.1. Zone Description

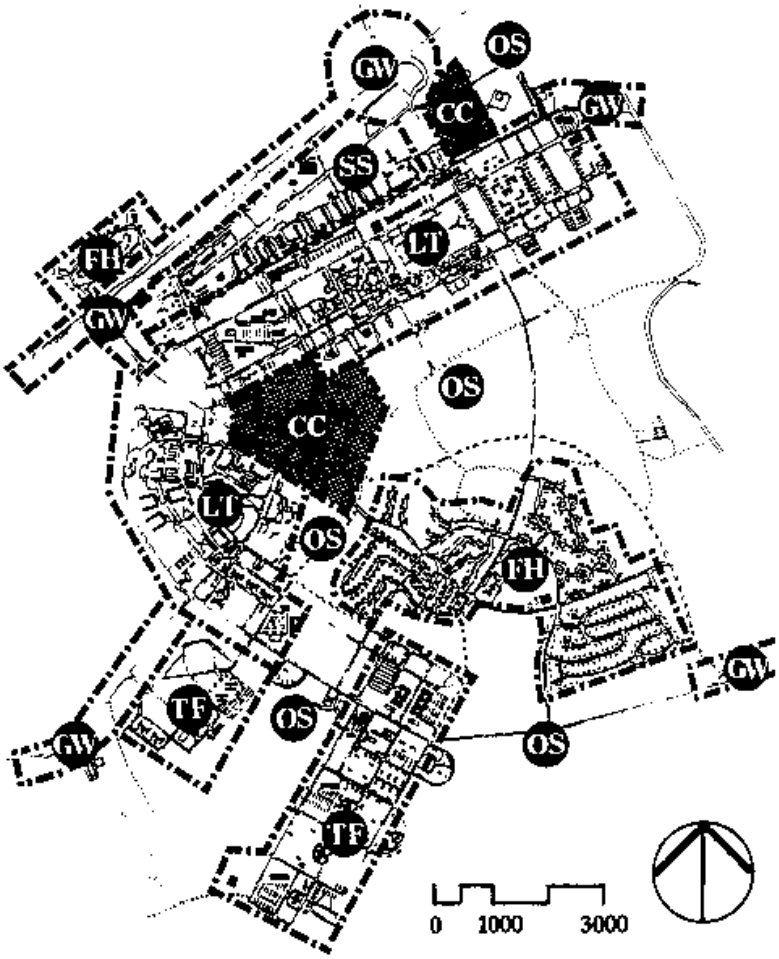
Almost all of Fort Lee's community service and recreation facilities are clustered in one central location, giving this area a strong identity as the hub of off-duty activity. The stadium area is an important visual asset as a green open space and forms a part of the park-like environment along Lee Avenue. The Officers' Club with its formal lawn presents an appropriate stately image at the terminus of the Lee Avenue axis roadway. (See FL. 5-9)

The visual clutter of the parking and circulation areas surrounding the Post Exchange is one of this area's greatest liabilities. Mechanical equipment and loading areas are often located within view of the main roadway and detract significantly from the image of the facility.

Goals for this area include improvement of access and parking areas at the PX and the screening or relocation of unsightly service and mechanical elements. Planting should be added along Mahone Avenue, at the theater and PX, and throughout the parking areas. Pedestrian pathways should be improved and carefully located to conveniently link the community facilities with other areas.

The new Commissary, remote from the PX area and located near the 6th Street gate, is an excellent example of high quality site planning, landscape and architectural treatment.

GW Gateway
LT Living/Training
CC Community Center
SS Service & Storage
TF Tenant Facilities
FH Family Housing
OS Open Space



FL. 5-9

5.4 Community Center Zone (PX Area) CC

5.4.2. Design Recommendations (PX Area)

1. Upgrade the Post Exchange parking lot. Improve circulation and access roads and provide landscaped islands to define parking bays. Reduce aisle width to 60 ft. to improve efficiency. Increase width of planting strip along Mahone Avenue edge to 15 ft. (min.). (See FL. 5-10)

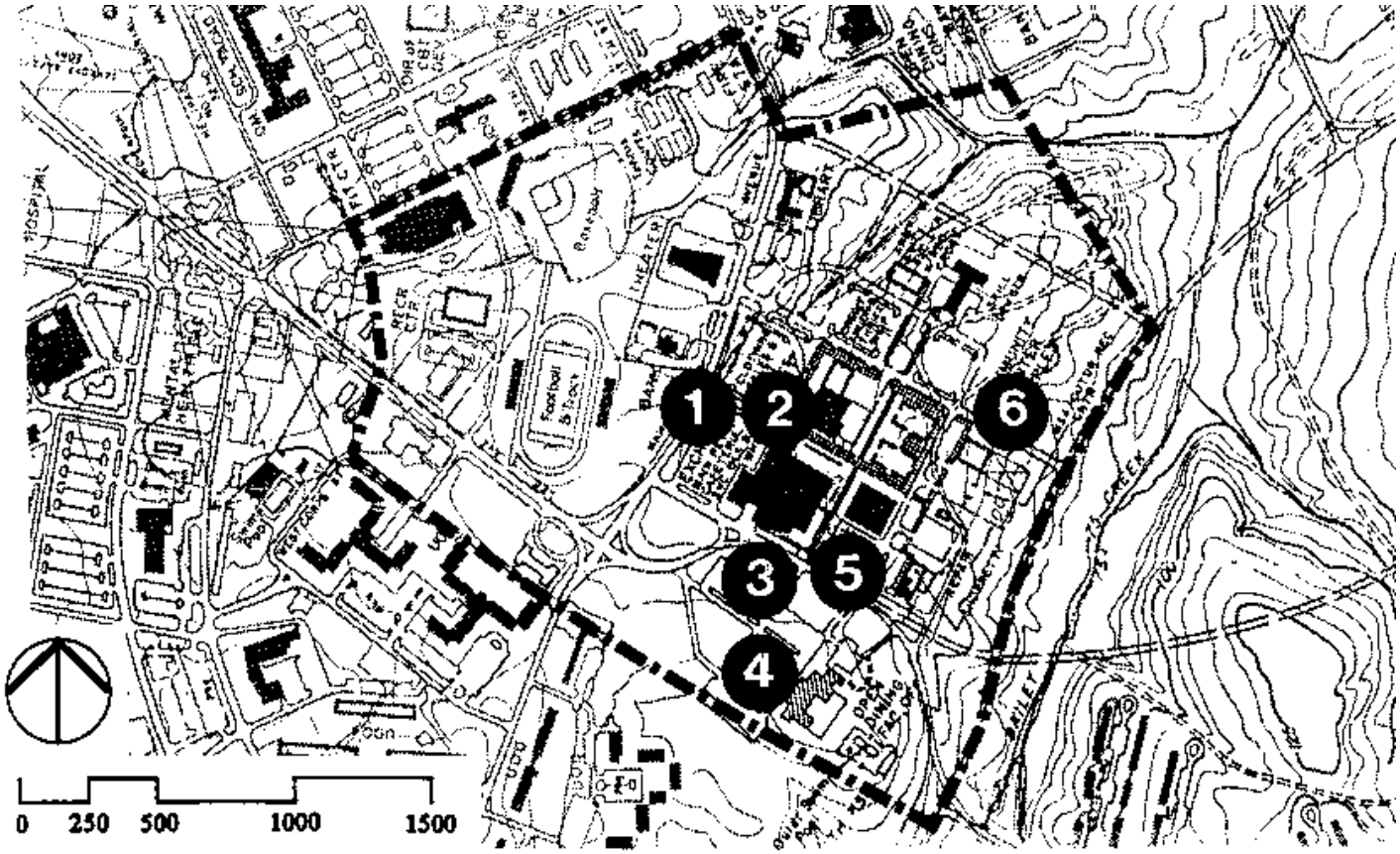
2. Improve pedestrian space in front of Post Exchange building. See Project #6. (See FL. 5-10)

3. Realign Battle Drive away from PX building to increase the setback distance and provide landscape screening of mechanical equipment and truck loading area. (See FL. 5-10)

4. Upgrade image of Officers Club building by providing new entry porticos. See project #9. (See FL. 5-10)

5. Develop a detailed master development plan to coordinate building siting, parking access and pedestrian spaces in the Post Exchange complex. (See FL. 5-10)

6. Develop a clear scheme for overall circulation throughout the PX complex. Remove vehicular traffic from the space between building numbers 9025 and 9028. As future buildings are sited, develop a ring road, extending along the north and east edges of the parking fields from the Shoppette to the Library. (See FL. 5-10)



FL. 5-10 Community Center Zone Map (PX Area)

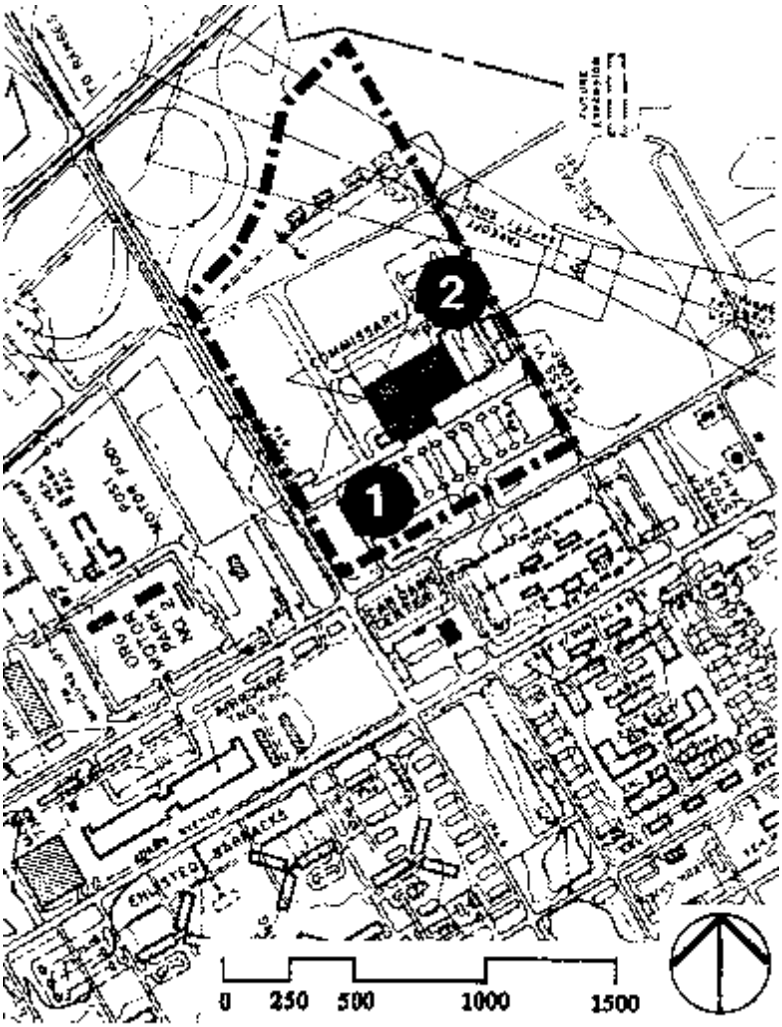
5.4 Community Center Zone (Commissary Area) CC

5.4.3. Design Recommendations (Commissary Area)

1. Enhance the high level of landscape and site improvements presently in place at the Commissary.
   (See FL. 5-11)

2. Screen with dense plant material the loading dock areas and helicopter landing area.
   (See FL. 5-11)

3. New construction should respect the materials and design character of the existing Commissary Building.



FL. 5-11
Community Center Zone Map (Commissary Area)

5.0 Visual Zones 12

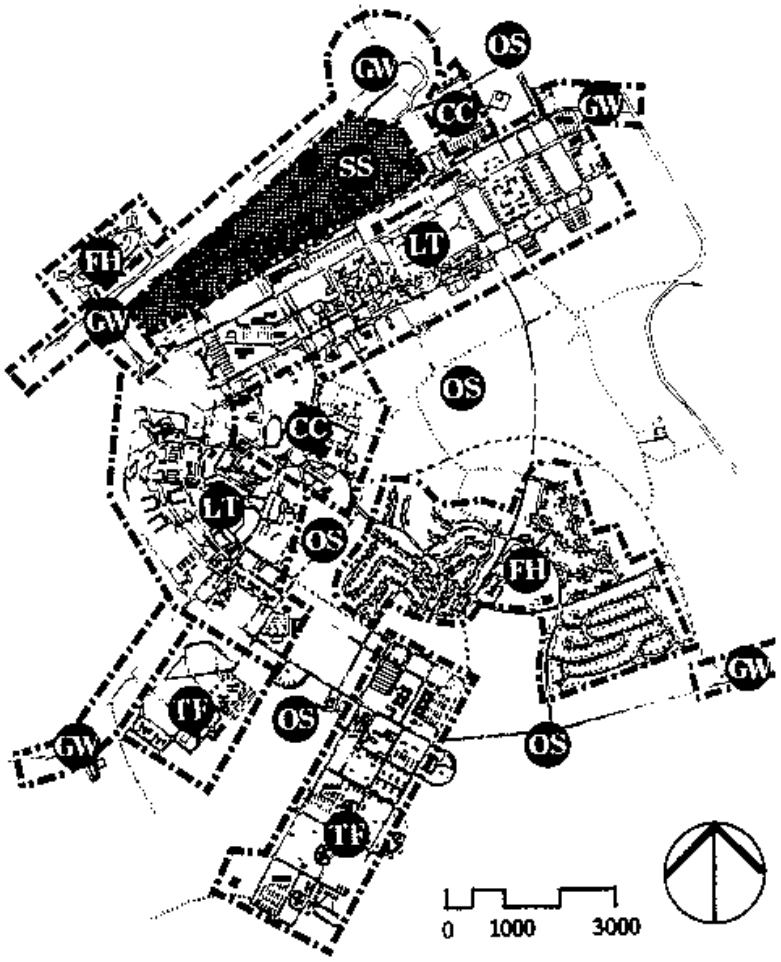
5.5 Service / Storage Zone SS

5.5.1. Zone Description

The training buildings and warehouses along Shop Road and Railroad Avenue present an orderly image with their regimented siting and form an appropriate image for the industrial area of the post. The storage yards, by their nature, are somewhat unsightly and presently lack visual screening. This is especially important where they can be seen from Route 36 or the 6th Street Gateway. Many open parking areas are undefined expanses of gravel and parking along the shoulder of Shop Road creates a cluttered image. (See FL. 5-12)

Goals for this area include improving visual screening at storage yards, as well as improvements to the parking areas. The siting of relocated and new facilities along the 6th Street edge should be carefully coordinated with the design for the new intersection and widened 6th Street gateway. Ample space should be provided for a forested buffer to visually screen the service and support area from the new entrance and elevated intersection roadway.

GW Gateway
LT Living/Training
CC Community Center
SS Service & Storage
TF Tenant Facilities
FH Family Housing
OS Open Space



FL. 5-12

5.0 Visual Zones 13

5.5 Service / Storage Zone SS

5.5.2. Design Recommendations

1. Design new warehouse structures in a consistent style and scale with a consistent palate of materials. Use brick on sides visible from Route 36. Align all the new structures square with street grid (R.R. Avenue) along a consistent setback line of 200 ft. (min.) from centerline of Route 36. See DC 1.3.
   See FL. 5-13)

2. Allow understory growth to develop among the stands of loblolly pines along the Route 36 edge to better screen the view from the public highway. Locate unslightly storage out of view, on other side of buildings or behind landscaped berms.
   (See FL. 5-13)

3. Preserve existing trees flanking Route 36, Lee Avenue and 6th Street. The *corridor- of-pines* effect that currently exists along Lee Avenue is extremely desirable and should be matched at the 6th Street gate. Maintain existing trees to a distance of 100 ft. from the edge of the roadway. Where breaks interrupt the continuity of these stands, plant loblolly pines mixed with other indigenous large scale species as infill to complete the frame.
   (See FL. 5-13)

4. Improve the image of Shop Road area by upgrading access roads, parking and storage areas along the north side of that road. Parking areas should be defined and restricted to specific areas to allow for landscaping, troop mustering areas, and organized access drive. See Project #7.
   (See FL. 5-13)

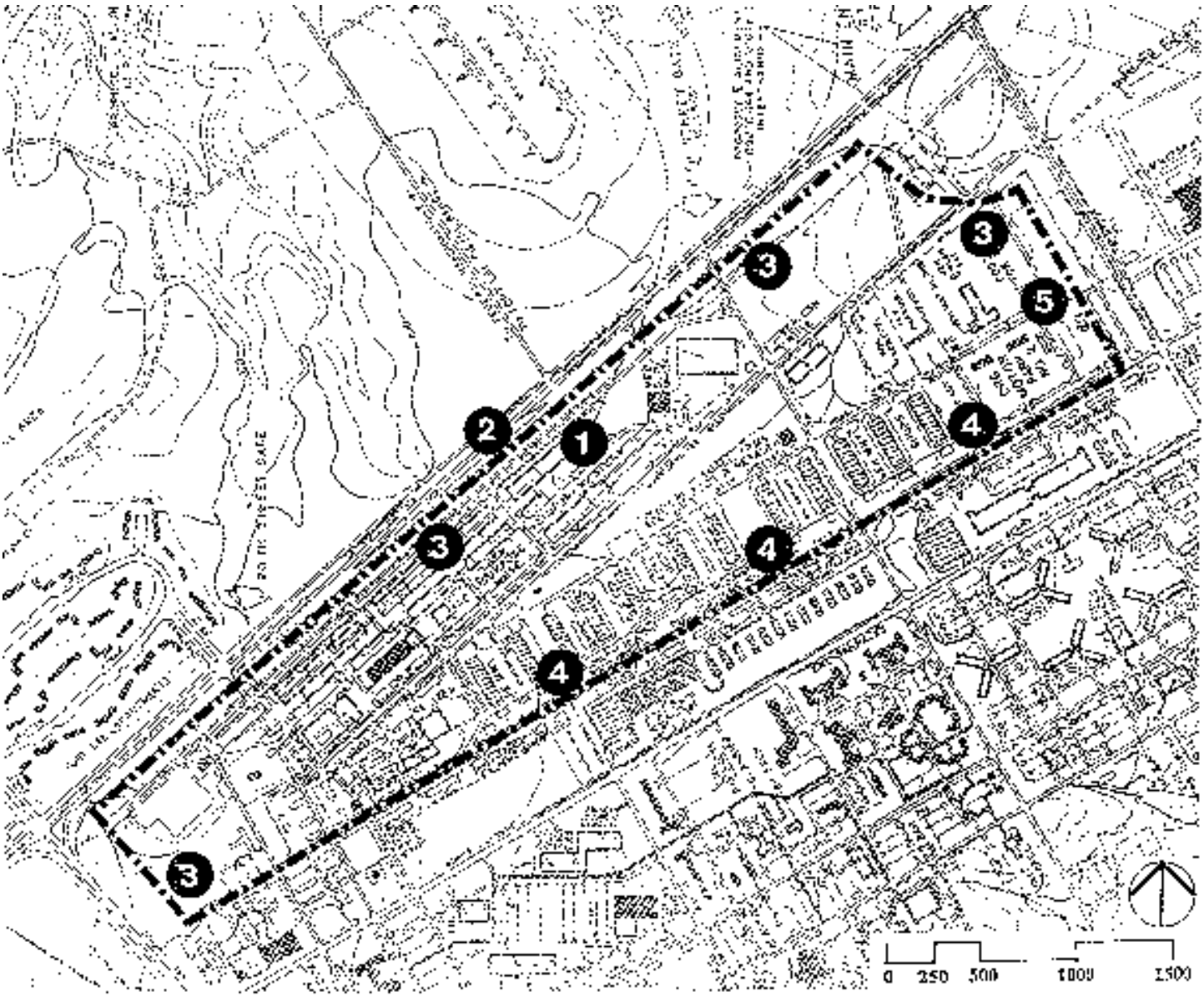
5. Maintain setback for security fencing at motor pool area a min. of 200 ft. from centerline of 6th Street (median) is recommended. See DC 3.2.3.
   (See FL. 5-13)

5.0 Visual Zones

13a
(Supplemental)

5.5 Service / Storage Zone

SS



FL. 5-13
Service and Storage Zone Map

5.0 Visual Zones 14

5.6 Tenant Facilities Zone TF

5.6.1. Zone Description

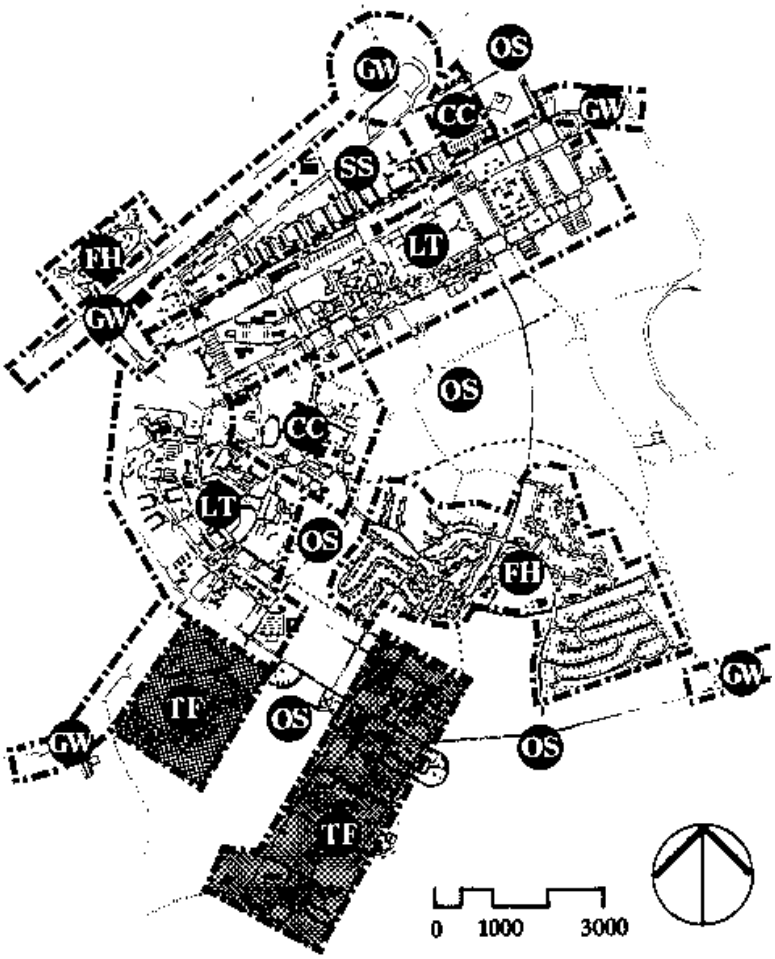
A spacious area separated from the rest of the main cantonment area provides an ideal setting for various tenant activities. The grid of streets from 38th to 41st Streets is an area which was originally developed during WWII and today enjoys a mature growth of tall pine trees. However, the particular location of many roadways does not relate well to current and planned uses, and should be adapted to better suit these new facilities. (See FL. 5-14)

The ALMC Center shares some of these same assets and liabilities. New buildings are generally well built and suitably sited, while remnant street patterns and temporary frame structures detract from the image.

Goals for these areas include the realignment or elimination of unnecessary roadways and coordinated planning to develop a coherent overall scheme. The 38th/41st Street area is a key area for future development. An overall Site Development Concept Plan should be developed to insure a unified image. Each tenant activity should be oriented with an identifiable focus around which buildings, parking areas and training facilities are clustered. Access to these facilities should be clearly organized, rather than diffused throughout a redundant grid of roadways. The mature trees should be preserved wherever possible.

Access to the ALMC Center building should be realigned to correct the circuitous route that now exists. Parking in this area should be improved to eliminate the visual clutter caused by overflow parking along streets and in unpaved areas. As temporary buildings are replaced with new facilities, siting of new buildings should be directed by an overall Site Development Concept Plan to insure a strong focus and unified image for the area.

GW Gateway
LT Living/Training
CC Community Center
SS Service & Storage
TF Tenant Facilities
FH Family Housing
OS Open Space



FL. 5-14

5.6 Tenant Facilities Zone TF

5.6.2. Design Recommendations

1. Produce a detailed site development master plan for all areas of major future development. These areas should include the Logistics Center, the ALMC Center, and the Petroleum School vicinity. The detailed site master plan is to coordinate the exact location of all buildings, parking, access drives, entrance orientations, loading docks, pedestrian areas, troop pathways landscaping, etc. (See FL. 5-15)

2. Organize the parking, circulation and access roadways around the Logistics Center. 38th Street and Byrd Avenue may be unnecessary through streets which can be incorporated into a ring-road configuration defining the parking area. (See FL. 5-15)

3. Organize the 38th-41st Street tenant area, focusing on 40th Street as a central spine and primary access roadway. A major troop movement pathway should be located alongside the street leading through the Tenant Facilities area to the Petroleum School. Each tenant complex should be "addressed" along 40th Street with clear directional signage for orientation. Unnecessary cross streets are to be abandoned or removed and not impose arbitrary constraints on future development sites. (See FL. 5-15)

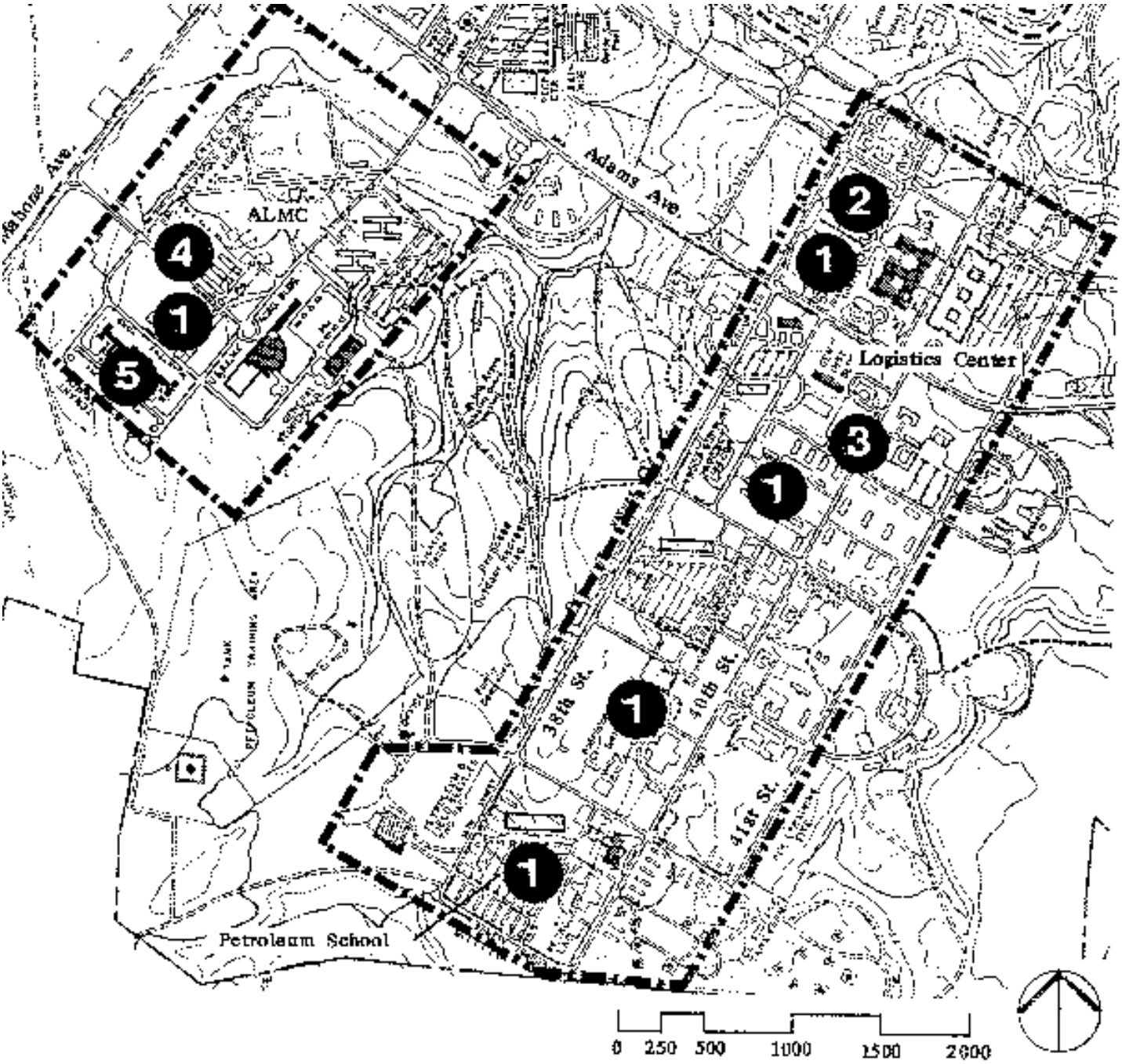
4. Organize the ALMC area, coordinating locations of access drives, parking, new development, landscaped areas and pedestrian spaces. Unnecessary remnant roadways are to be removed as obsolete buildings are demolished. A new entry drive from Mahone Avenue should be aligned with the entrance to the ALMC building. Consolidated parking areas should flank both sides of that entry drive, providing a central parking field for the surrounding facilities. See DC 1.7.1 through 1.8. (See FL. 5-15)

5. Improve pedestrian access to buildings #12400 and 12401 from rear parking areas. Screen mechanical equipment and separate pedestrian access from loading areas. (See FL. 5-15)

5.0 Visual Zones

5.6 Tenant Facilities Zone

TF



FL. 5-15

Tenant Facilities Zone Map

5.0 Visual Zones 16

5.7 Family Housing Zone FH

5.7.1. Zone Description

Fort Lee's woodlands, rolling hills, and stream valleys create a rich natural setting for family housing areas and provide buffer areas insulating these areas from surrounding post activities. The edge of the forest is a valuable amenity when housing is placed along it. The general quality of the housing units themselves is good, and the recent addition of wooden fences represents a good approach to screening outdoor storage, patios and mechanical equipment. However, often the air conditioning compressors are unscreened by landscaping or fencing and, therefore, detract from the image of the house entries. (See FL. 5-16)

In a few locations on-street parking creates visual clutter and an appearance of expansive paving without relief from landscaping. These areas, particularly at Yorktown Drive, should be reorganized to separate the parking from the roadway and provide landscaping to screen the parking and create visual divisions within the larger area. Coordinated fencing of appropriate scale should be used to screen air conditioning equipment, mechanical access doorways, and provide screening for patio areas.

Plans to relocate overhead utilities underground will significantly reduce visual clutter and provide an opportunity to develop an improved domestic scale lighting system.

GW Gateway
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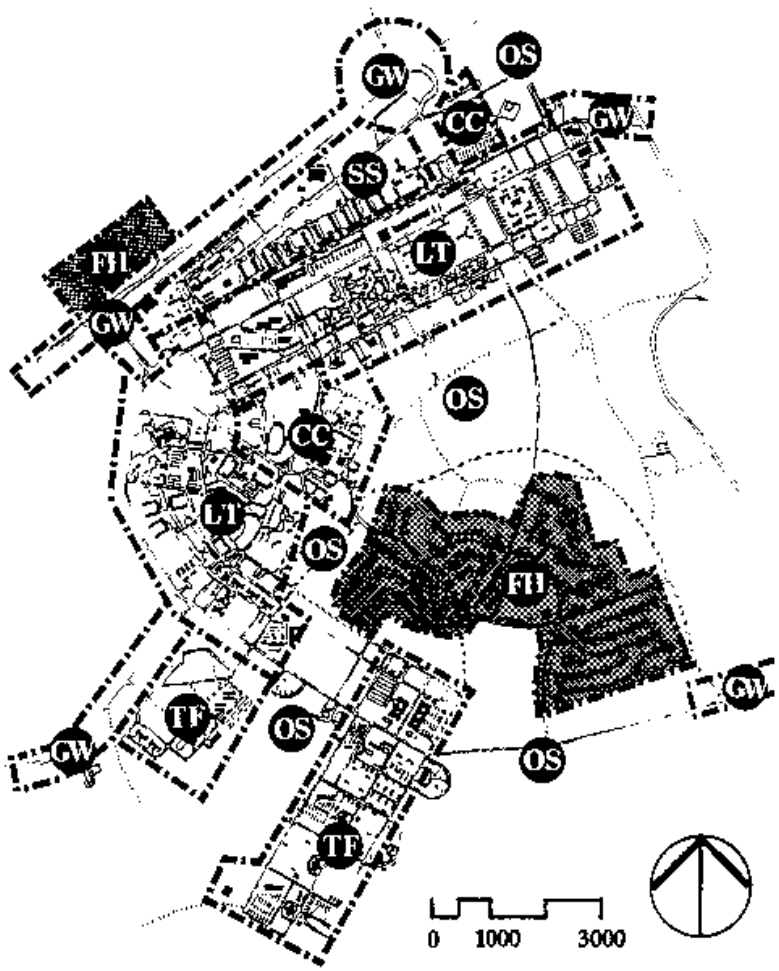


FL. 5-16

5.0 Visual Zones 17

5.7 Family Housing Zone FH

5.7.2. Design Recommendations (Family Housing Zone)

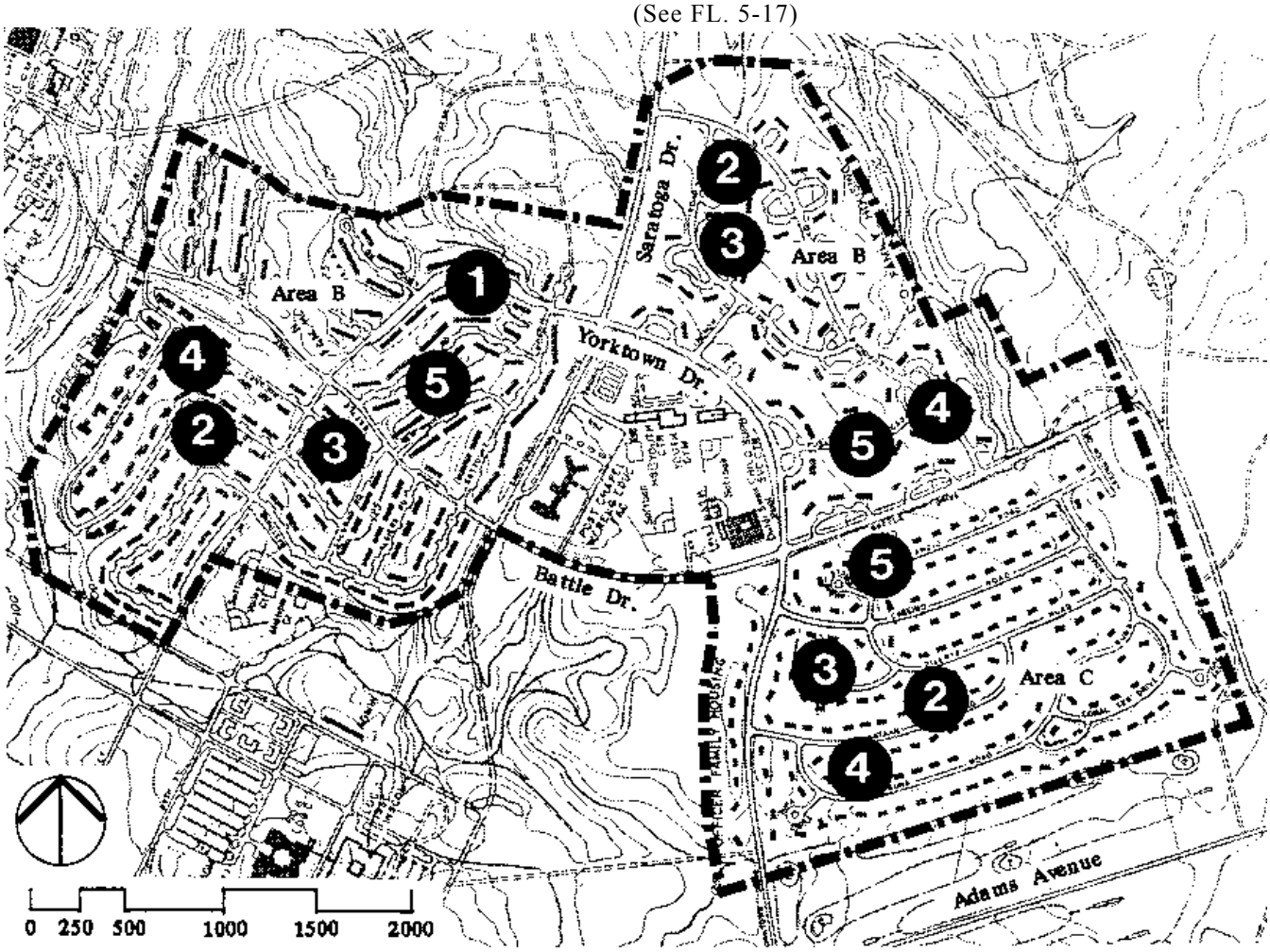
1. Upgrade Yorktown Drive from Saratoga to Battle Drive. Define parking areas, reduce street width, add curbs and landscaping, relocate overhead utility lines.
   See Project #4.
   (See FL. 5-17)

2. Relocate overhead utilities underground throughout family housing areas. Lines may be located in rear yard areas.
   See DC 1.4.7.
   (See FL. 5-17)

3. Replace highway type low pres-sure sodium street lights with residential scale standards throughout housing neighborhoods. See DC 5.1.
   (See FL. 5-17)

4. Provide plantings or low wooden fence to screen view of air compressor units located at front of individual units.
   See DC 4.1.

5. Improve individual identity to rear patio areas by provision of fencing and other landscape improvements. See DC 3.5.2.
   (See FL. 5-17)



FL. 5-17 Family Housing Zone Map

5.0 Visual Zones 18

5.7 Family Housing Zone (North of Rte. 36) FH

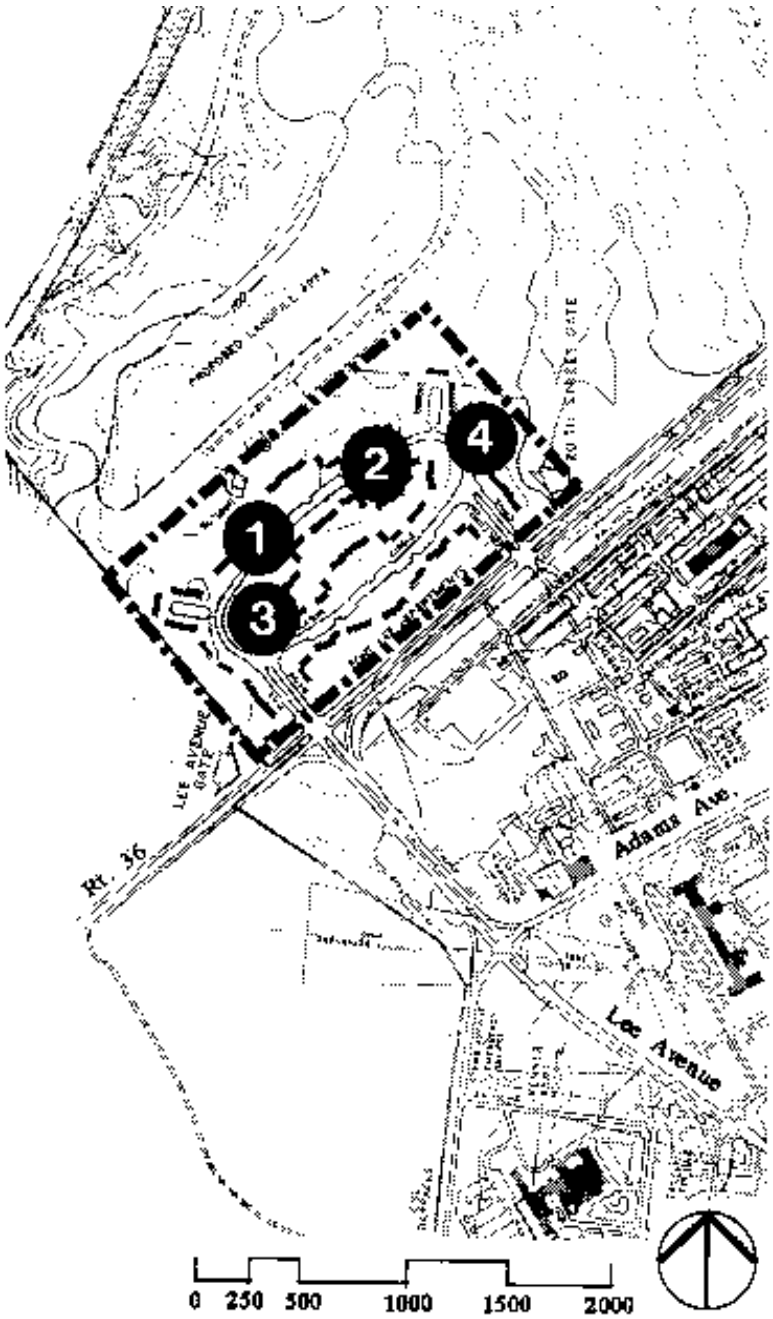
5.7.3. Design Recommendations - Family Housing Zone (North of Rt. 36)

1. Relocate overhead utilities underground throughout family nousing areas. Lines may be located in rear yard areas. See DC 1.4.7. (See FL. 5-18)

2. Replace highway type low pressure sodium street lights with residential scale standards throughout housing neighborhoods. See DC 5.1. (See FL. 5-18)

3. Provide plantings or low wooden fence to screen view of air compressor units. DC 4.1. (See FL. 5-18)

4. Improve individual identity to rear patio areas by provision of fencing and other landscape improvements. See DC 3.5.2. (See FL. 5-18)



FL. 5-18

Family Housing Zone Map (North of Rt. 36)

5.0 Visual Zones 19

5.8 Open Space Zone OS

5.8.1. Zone Description

Woodland areas surround and run throughout Fort Lee creating a natural setting for field training and separating various areas of the post. The woodlands are one of Fort Lee's most valuable visual assets and should be managed to protect and enhance their natural forest image. Occasionally areas of woodland must be harvested. These cleared areas should be restricted to locations out of view from the main roadways and other active areas of the post. The edge of the forest should appear to be natural with a diversity of species and understory growth. (See FL. 5-19)

Pathways used for troop movements should be paved and well drained. A system of storm water management should be developed to minimize soil erosion caused by run-off from other developed areas of the post. Finally, areas for outdoor group instruction should be carefully located and designed to best support that activity, with consideration given to wind protection, sun orientation and other microclimatic conditions.

GW Gateway
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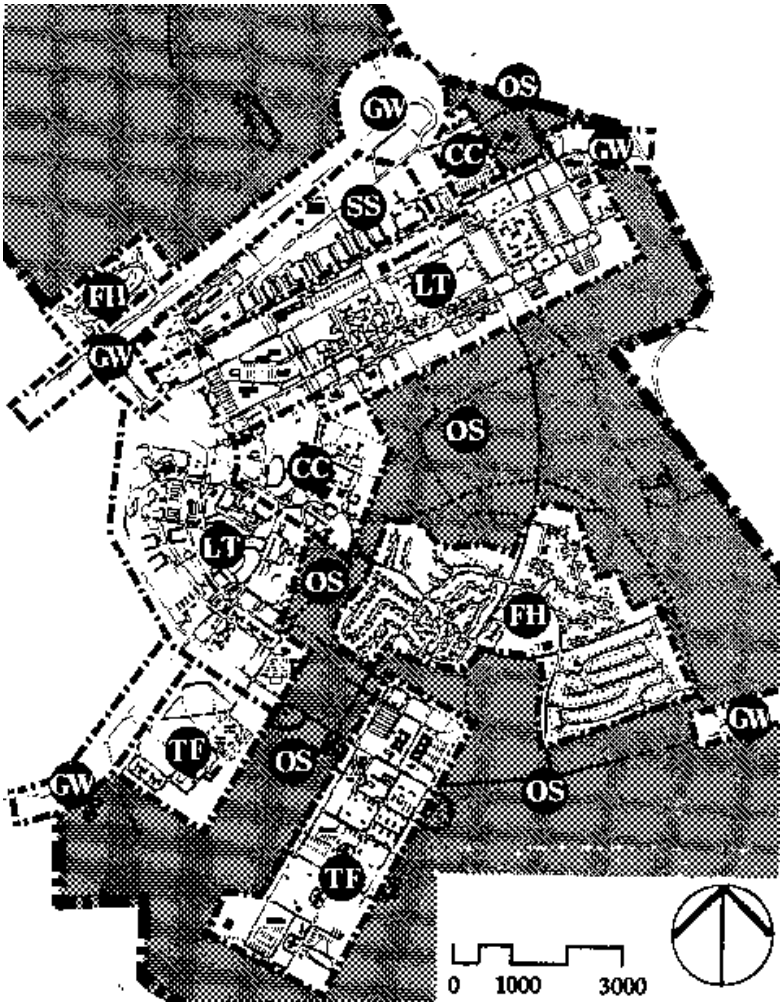
FH Family Housing
OS Open Space



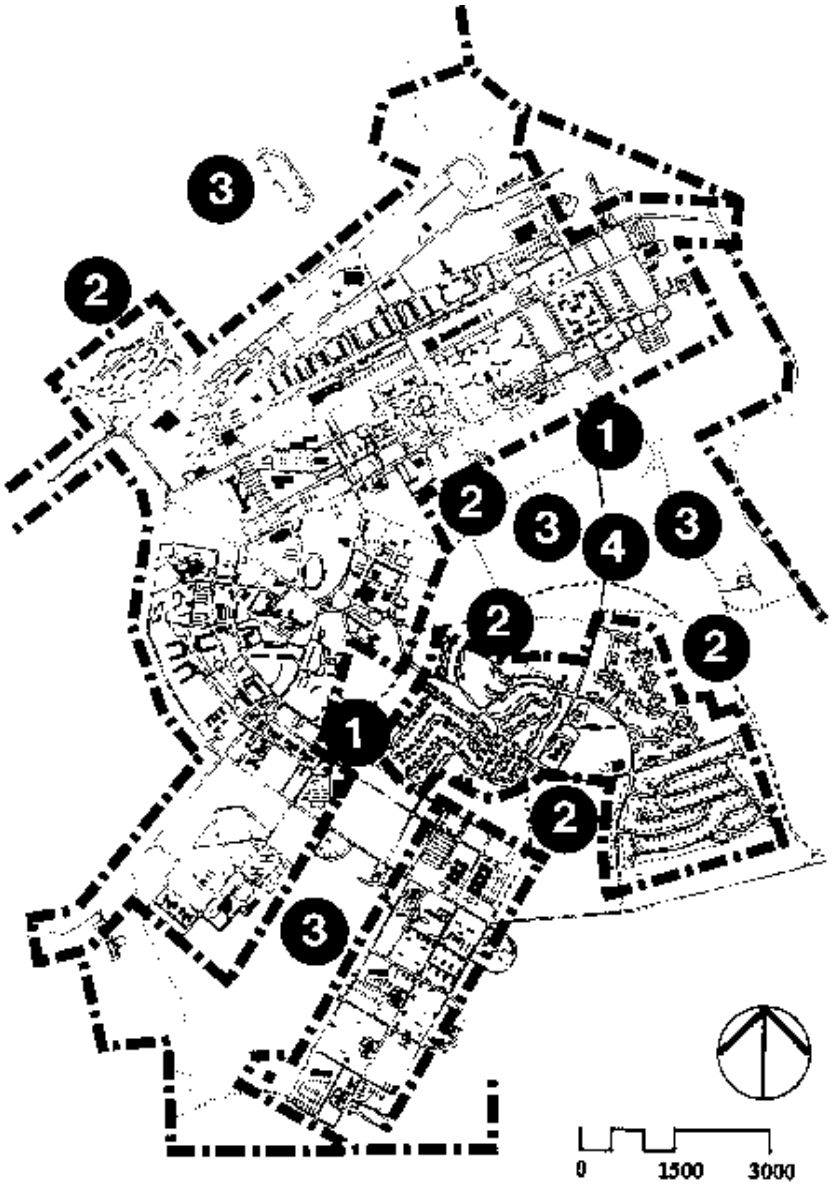
FL. 5-19

5.0 Visual Zones 20

5.8 Open Space Zone OS

5.8.2. Design Recommendations

1. Prevent unsightly effects of erosion. Repair washed out areas at culverts. Replace deep open trenches with wider, shallower, more gently sloping swales. (See FL. 5-20)
2. Maintain the natural forest edge allowing for understory growth and a transition area between the mowed areas and full height canopy trees of the forest. See DC 3.5.4. (See FL. 5-20)
3. Maintain roadways through the forest as troop movement pathways leading to major training areas. (See FL. 5-20)
4. Develop a troop movement pathway flanking Saratoga Drive. See DC 1.5.1. (See FL. 5-20)



FL. 5-20

Open Space Zone Map

Section 3

Design Criteria

6.0 Design Criteria Section 1 Site Planning

Design Criteria Section

1 Site Planning

6.1 Site Planning 1.0

6.1.1. Post Environment

GW LT CC SS TF FH OS
(Page 1 of 2)

6.1.1.1. Topography

Fort Lee is characterized by a gently rolling terrain with intermittent level areas. The installation is located on the inner part of the Atlantic Coastal Plain on the Virginia peninsula near the Appomattox and James Rivers. It is in a metropolitan area that has had a history of agricultural and military activities. Topographic elevations range from 50 to 160 feet above sea level; higher elevations occur in the western and southern areas of the post and lower elevations along Bailey and Cabin Creek and along Route 630. Developed areas are generally level, surrounded by hilly undeveloped forested areas. The wooded range area across Highway 36 is flat as well.

Soil erosion is generally not a problem in undeveloped areas, however it is recommended that preventive measures be taken for any proposed development during and after construction. Installation areas with slopes 5% or greater should not be developed if possible but reserved for training purposes; this would apply to hilly areas in the middle of and northeast of the main cantonment.

6.1.1.2. Soils

Since most of the area within the post has had an extensive agricultural history, most of the soils are acidic and leached. Soils along stream flood beds (Bailey and Cabin Creeks) are primarily of an alluvium composition. Three soils associations within the post are: Emporia-Slagle-Bonneau (clay loam), Degue-Pooler-Wahee (silts and clays), and Fluvaquents (sandy loams, poorly draining). At a depth of 250-300 feet is the Petersburg Granite layer which dates back to the Paleozoic Age which is topped with alternating layers of clays, sand, gravel, and marl.

Most of the Fort Lee soils appear to be dense with occasional pockets of soft clays. This indicates that the type of structural foundations to be used will vary and will be determined after soil borings are analyzed.

The water table ranges from 10 to 15 feet below ground surface at most sandy and clay soil areas; if excavation requirements are of a greater depth, the water table will require lowering. Impervious clay layers may have higher water tables which will require drainage also. Due to the high water table, all surfaced pollutants should be kept to a minimum.

6.1.1.3. Vegetation

Existing forested areas form a permanent buffer along the reservation boundaries and create a well-defined edge along the main cantonment. The section of the post north of Route 36 is primarily wooded, except for the Fort Lee apartments and cleared training areas.

Approximately one-half of the installation, south of Route 36, consists of woodlands of mixed pine and hardwood species. Near the Lee Avenue gateway, the predominant species are Loblolly Pine and oak varieties, with mixed hardwood stands of oak, hickory and maple throughout. Additional small hardwood stands are found near Blackwater Swamp along streams and poor drainage areas.

Under the Woodlands Management Plan, Loblolly Pine and other marketable lumber is

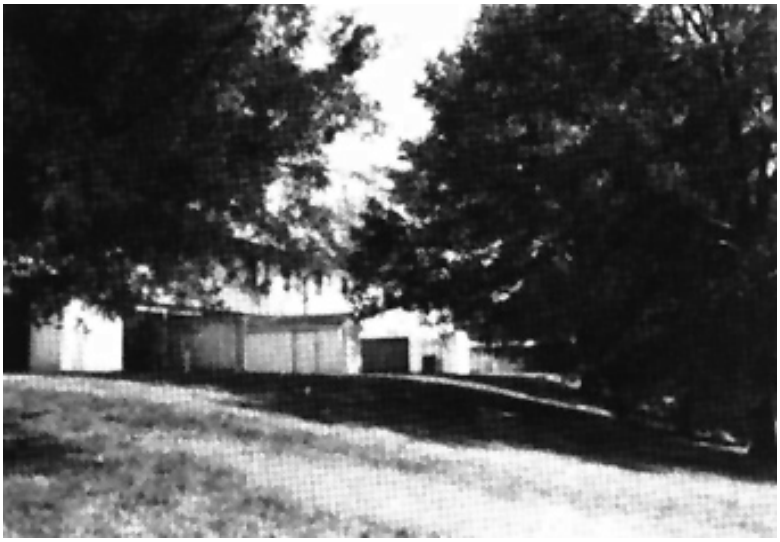
6.1 Site Planning 1.0

6.1.1. Post Environment

GW LT CC SS TF FH OS

harvested using the clear-cut method. Most of the woodlands have good surface drainage and adequate ground water reserves to maintain a good tree cover.

Predominant shade trees in developed areas throughout the post include Willow Oak, White Ash, and Southern Magnolia. Extending development into swamp areas should be avoided and indigenous plantings should be used if possible. Native grasses and understory plantings should be used at the existing forest edge in a transition zone between native woodlands and plantings used in developed areas. (See FL. 6-1)



FL. 6-1

Willow Oaks are widely used on grounds and along streets.

6.1 Site Planning 1.1

6.1.2. Design for Climatic Conditions

GW LT CC SS TF FH OS

(Page 1 of 2)

Provide protection from rain at building entrances. Provide positive drainage to minimize freezing rain along pedestrian walkways and roadways.

Provide adequate storm drainage to protect excessive soil erosion during periods of heavy rains. Provide curbs and catch basins in areas of severe erosion. Open ditches should be buried, using piping and culverts to minimize soil erosion in these areas as well. (See FL. 6-2)

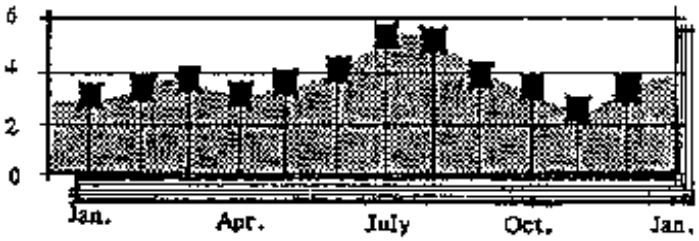
6.1.2.1. Temperature Range

Promote natural ventilation through operable windows or economy cycles for HVAC systems in spring and fall. See TM 5-785 for engineering heating/cooling requirements. (See FL. 6-3)

6.1.2.2. Solar: Latitude 37°14'

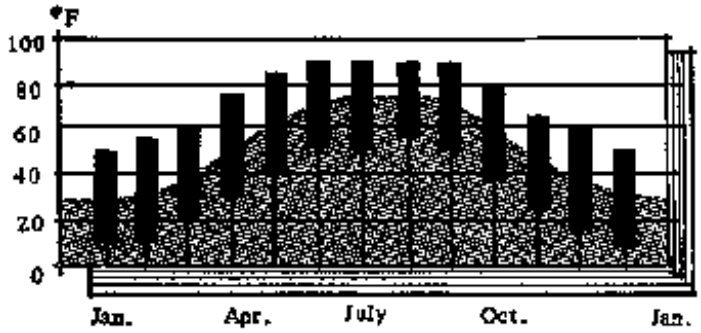
Heat gain through walls and glazed openings should be minimized in summer, but where possible promoted in winter. Take advantage of seasonal changes in altitude of the sun to achieve this in the design of window openings.

Provide shading from hot summer sun by planting large deciduous trees on the south and west sides of buildings and pedestrian areas. Use the solar angle data to predict extent of shading. (See FL. 6-5)



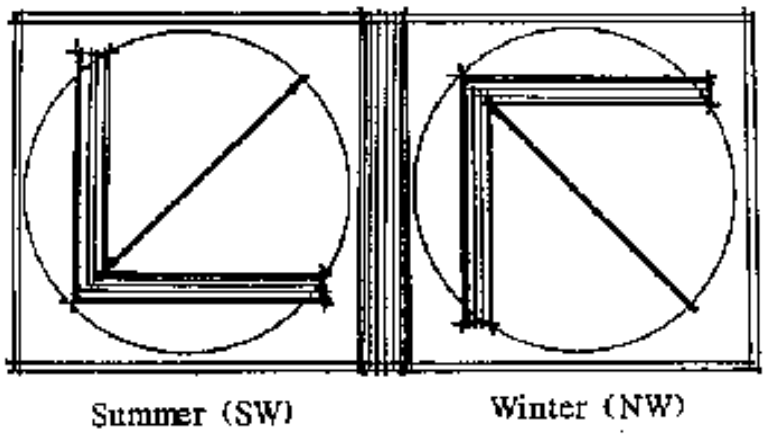
FL. 6-2

Precipitation (inches/month, mean.)



Temperature Range **Degrees F.**
(Source: TM-5-785 / p. 3-255)

FL. 6-3



Prevailing Winds

FL. 6-4

6.1 Site Planning 1.1

6.1.2. Design for Climatic Conditions

GW LT CC SS TF FH OS
(Page 2 of 2)

6.1.2.3. Temperature

The climate of Fort Lee is a modified continental one with warm, humid summers, and mild winters. The coldest temperatures occur in January, ranging from 20°F to 40°F, and seldom reaching zero or below. Summer temperatures seldom reach 100° or above. Spring and autumn weather is generally mild and pleasant.

6.1.2.4. Precipitation

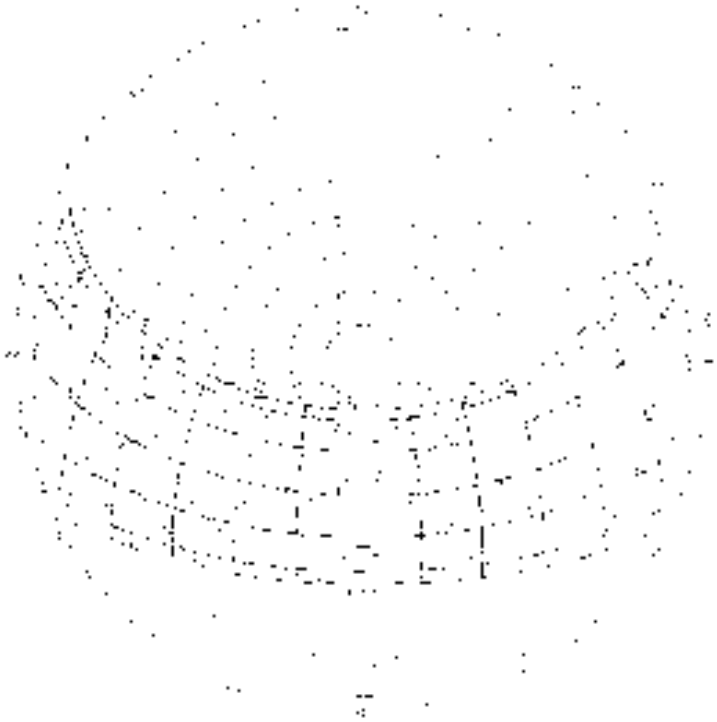
Rainfall is usually uniformly distributed throughout the year with monthly variability. Occasional dry periods occur in autumn lasting several weeks. Flooding is a possibility during summer and early autumn from hurricanes and tropical storms bringing record rainfalls. Tornadoes are infrequent but have been sighted in the area.

6.1.2.5. Wind

Wind direction is variable; in winter and early spring the prevailing winds are from the south and southwest, occasionally from the northeast. Summer prevailing winds are from the south-southwest as well. (See FL. 6-4)

6.1.2.6. Microclimate

Variations in micro-climate occur in temperature, wind velocity, light, and humidity. Forested areas differ in all these factors from developed areas with resulting increased run-off and higher velocity winds in open developed areas. Where winter wind is strong under micro-climatic conditions, provide wind breaks where possible with tall evergreen plantings.



Solar Path for 37 degree N Latitude

FL. 6-5

6.1.3. Existing Roadway Classification System

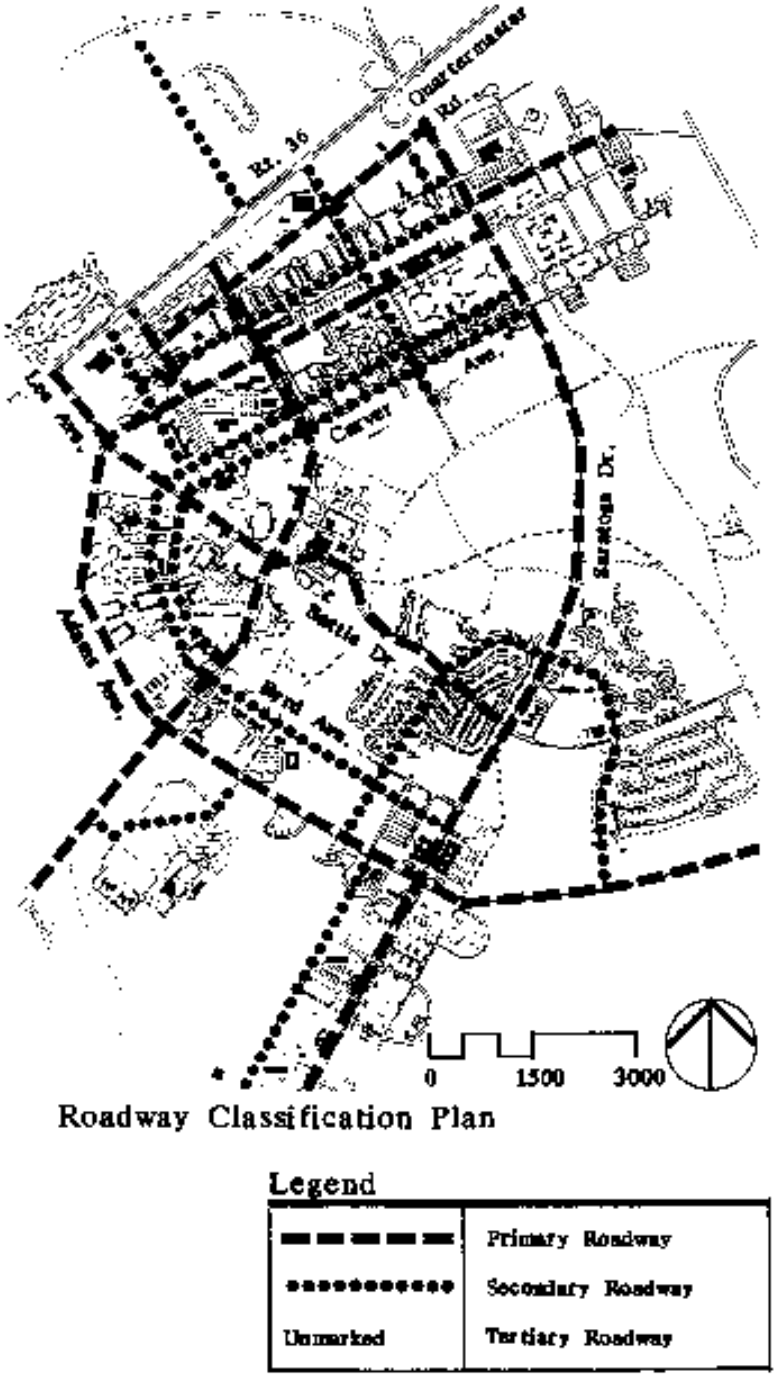
GW LT CC SS TF FH OS

General Notes

Fort Lee's network of roadways establishes a strong spatial organization, and to a large extent, determines how one sees the installation. The most important road is Adams Avenue, which links together the entire main cantonment area, forming the vehicular spine of the crescent and extending from 1st Street to the Adams Avenue gate. Lee Avenue and 6th Street are important as primary gateways to the post. Saratoga Drive is important as an extension of the 6th Street gateway and link between the two ends of the Adams Avenue crescent.

The present lack of a clear hierarchy in roadway design is a major liability for Fort Lee's street system. The scale of certain streets does not reflect the road's relative importance. Redundant and parallel through routes such as Shop Road, Byrd and Carver Avenues, allow traffic to “filter” through areas rather than flow along a central corridor. While this pattern may disperse traffic volumes, it weakens the sense of orderliness and arbitrarily causes higher traffic flows along local access streets.

The image of Adams Avenue as the primary vehicular spine should be reinforced through roadway improvements, lighting, signage and uniform planting. The roadway should appear as a consistent element linking together the various areas of the post. The hierarchy of primary, secondary and tertiary road types should be reinforced through the uniform treatment of landscaping, roadway cross-section, building setbacks, lighting, and orientation. Gateway intersections should appear as important nodes with generous building setbacks and large scale monuments, where appropriate. Redundant parallel streets should be minimized and eliminated where possible to allow larger contiguous spaces for development and simplified traffic patterns. (See FL. 6-6)



Roadway Classification Plan

FL. 6-6

6.1.4. Troop Movement and Bikeway Systems

GW LT CC SS TF FH OS

General Notes

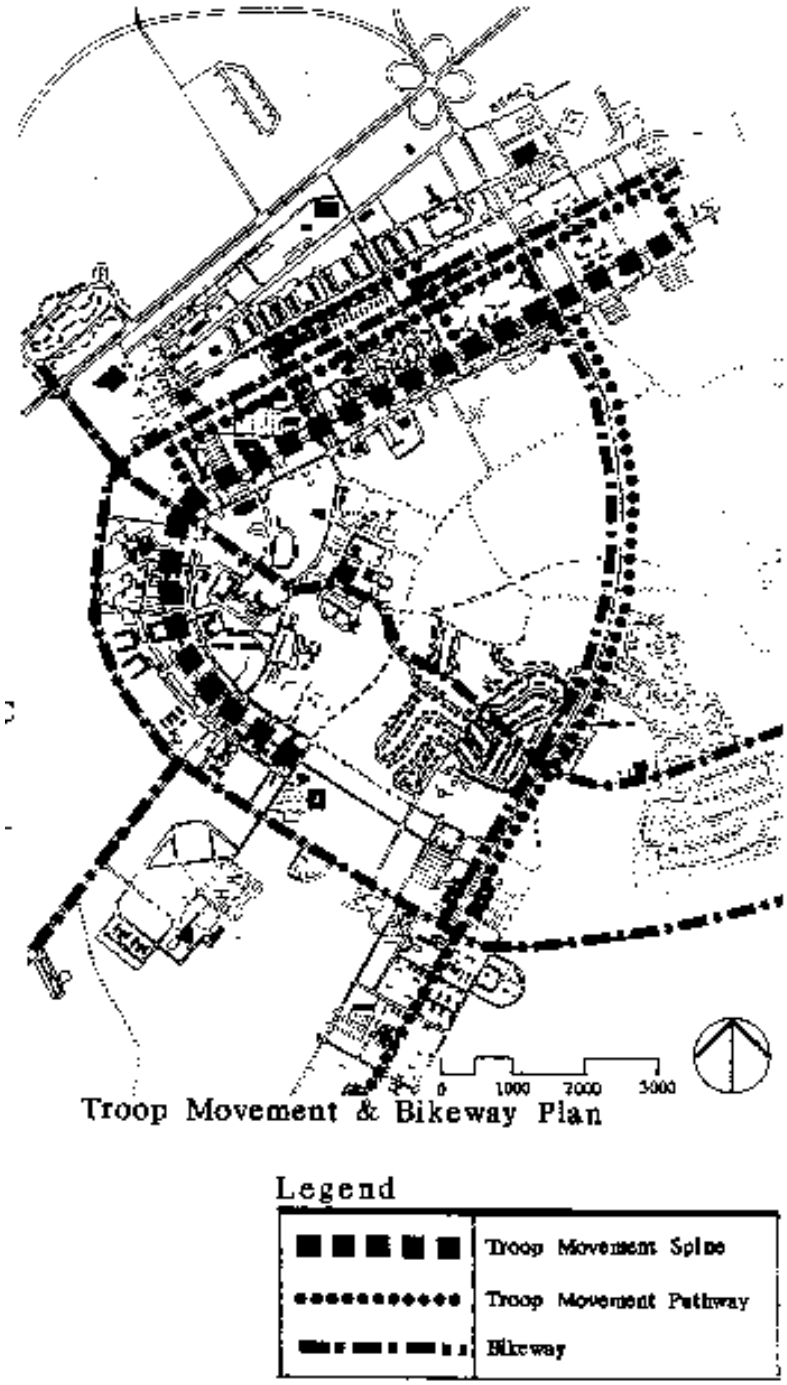
A major opportunity exists at Fort Lee to create a significant, dedicated pedestrian movement system. At present massed groups of soldiers (platoons) are marched about the post between living quarters and training facilities. They presently utilize the street system and this creates significant conflicts with vehicular traffic. Three alternative movement systems to the auto are recommended:

Troop Movement Spine - A major troop movement corridor should be developed as illustrated along Byrd Avenue.
See DC 1.5.1-1.5.3.

Troop Movement Pathway - A smaller troop movement pathway should be developed connecting troop training areas along Saratoga Drive, in the Shop Road area and across Route 36 to the north. See DC 1.5.4 & 1.5.5.

Bikeway - A bikeway system should be developed to connect family housing neighborhoods to training and administrative area. A loop system incorporating Adams Avenue, Lee Avenue and Saratoga Drive is recommended. See DC 1.5.6 & 1.5.7.

The bikeway indicated on map at right illustrates major system only. Other secondary bikeway systems should be developed as need dictates. (See FL. 6-7)



FL. 6-7

6.1 Site Planning 1.2

6.1.5. Building Orientation/Siting GW LT CC SS TF FH OS

General Notes

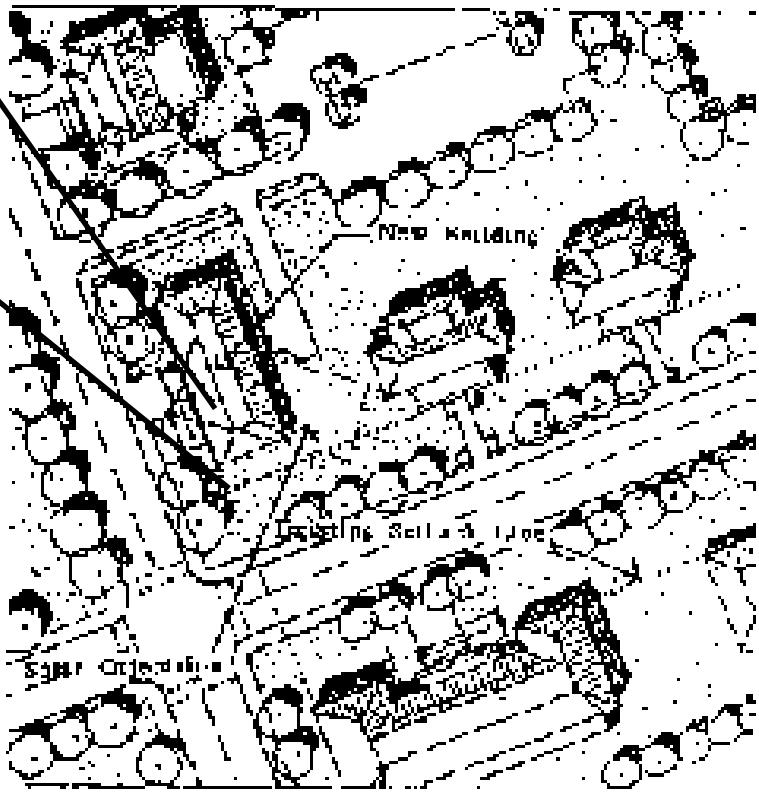
* Orientation of buildings parallel to street should take precedence over irregular solar orientation in siting. An energy efficiency study may be required to permit siting to occur when building is beyond 10° off the east-west axis.

* Set back the building so that its facade plane is aligned with other buildings on the same street.

* Where more than one street grid pattern exists, choose the most important frontage to orient the building.

* Spaces between buildings will be regularly shaped rectangles, which are therefore more useful for parking and service areas.
(See FL. 6-8)

Note: DOD regulations require all new buildings to be oriented with the broad side within 15° to 20° of due east-west. In general, this may lead to energy savings in buildings with certain massing proportions. However, in many circumstances, specific analysis of the actual design may indicate site development inefficiencies resulting from the awkward orientation where prevailing street grids and existing adjacent buildings are oriented otherwise. Moreover, other measures may be taken in the specific building design to optimize energy efficiency, such as shading devices at window openings, coordination of deciduous tree plantings, overall building envelope massing and certain types of skylighting. This type of analysis is strongly recommended so that buildings are oriented according to the solar guideline (i e. 15° to east-west) only when it is clear that this will indeed be effective for the actual building design. If solar orientation will not significantly affect the particular building, then it should be oriented squarely with the street or existing building grid.



FL. 6-8

Solar Orientation can cause design inefficiencies in existing built-up areas with strong orthagonal street grids.

6.1 Site Planning 1.3

6.1.6. Building Setbacks GW LT CC SS TF FH OS

Minimum Required Building Setbacks

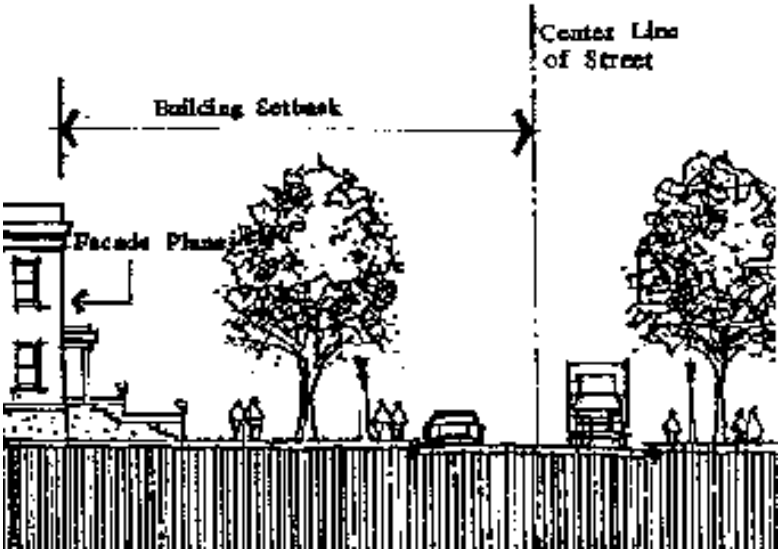
Any new building or addition is to be located so that its facade plane is set back from the street centerline the following minimum distances. In existing built-up areas the setback requirement is intended to reflect the prevailing existing setbacks. In general, new buildings in these areas should be aligned with adjacent existing permanent structures. Follow this procedure:

1. Check the minimum setback required.

2. Compare with existing permanent adjacent buildings on both sides.

3. If there is a significant difference, and if the existing buildings are to remain then conform to existing conditions after verifying with the DEH. (See FL. 6-9)

The chart to the right specifies minimum building setbacks. Check DC 1.4.1 through 1.4.7 for additional setback and build-to requirements in particular areas. When more than one setback is described, the more restrictive (greater distance) is to apply.



FL. 6-9

Recommended Minimum Building Setbacks

Route 36 Highway	275 ft.
Lee Avenue	200 ft.
6th Street (North of Adams)	200 ft.
Saratoga Drive	100 ft.
Mahone Avenue	100 ft.
Adams Avenue	100 ft.
Byrd Avenue	75 ft.
Carver Avenue	100 ft.
Shop Road	75 ft.
Rear Access Road	50 ft.
Quartermaster Road	50 ft.
1st Street	50 ft.
6th Street (South of Adams)	150 ft.
11th Street	100 ft.
13th Street	75 ft.
16th Street	100 ft.
19th Street	100 ft.
38th Street	100 ft.
40th Street	100 ft.
41st Street	100 ft.
All other numbered streets	75 ft.

Match existing setbacks measured to face of existing adjacent buildings.

6.1 Site Planning 1.4.1

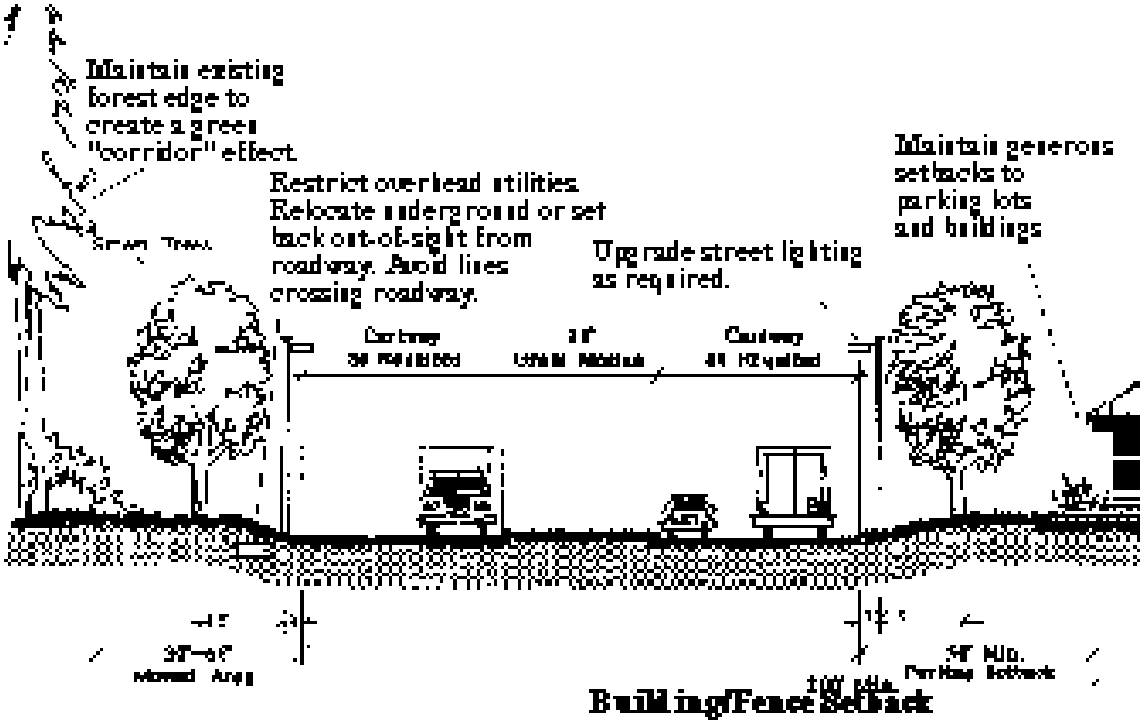
6.1.7. Roadway Cross Sections GW OS

6.1.7.1. Main Gate Roadways

General Notes

The roadway cross section at major gateway entries should project an image of prominence and orderliness. A planted median and large street trees at the roadway edge should form these important, formal post gateways. (See FL. 6-10 and FL. 6-11)

FL. 6-10 Lee Avenue is the main entry from Route 36.



FL. 6-11 Lee Avenue Section

6.1 Site Planning 1.4.2

6.1.7. Roadway Cross Sections OS LT

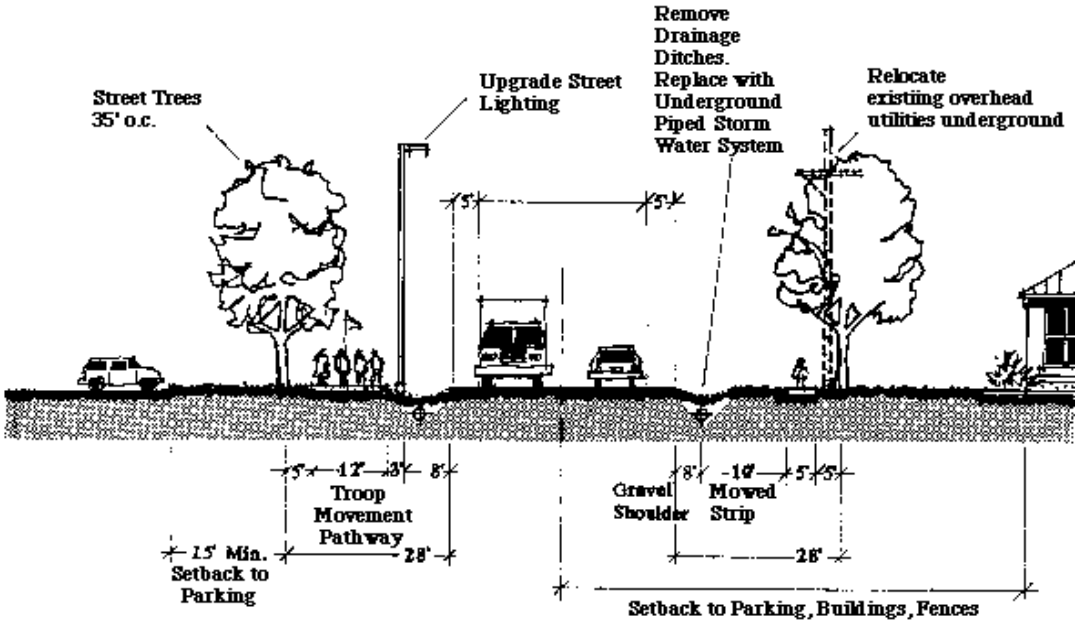
6.1.7.2. Primary Road (Adams Ave.)

General Notes

Adams Avenue represents the most important roadway providing primary access to activities on Post and defining the crescent-shaped Living/ Training Zone. The visual appearance of the roadway should emphasize its importance in the post's roadway hierarchy. Landscaping, lighting and signage should all be designed to contribute to this visual impression (see appropriate Design Criteria). (See FL. 6-12 and FL. 6-13)

FL. 6-12

Adams Avenue is a primary roadway throughout the post.



FL. 6-13 Adams Avenue Section

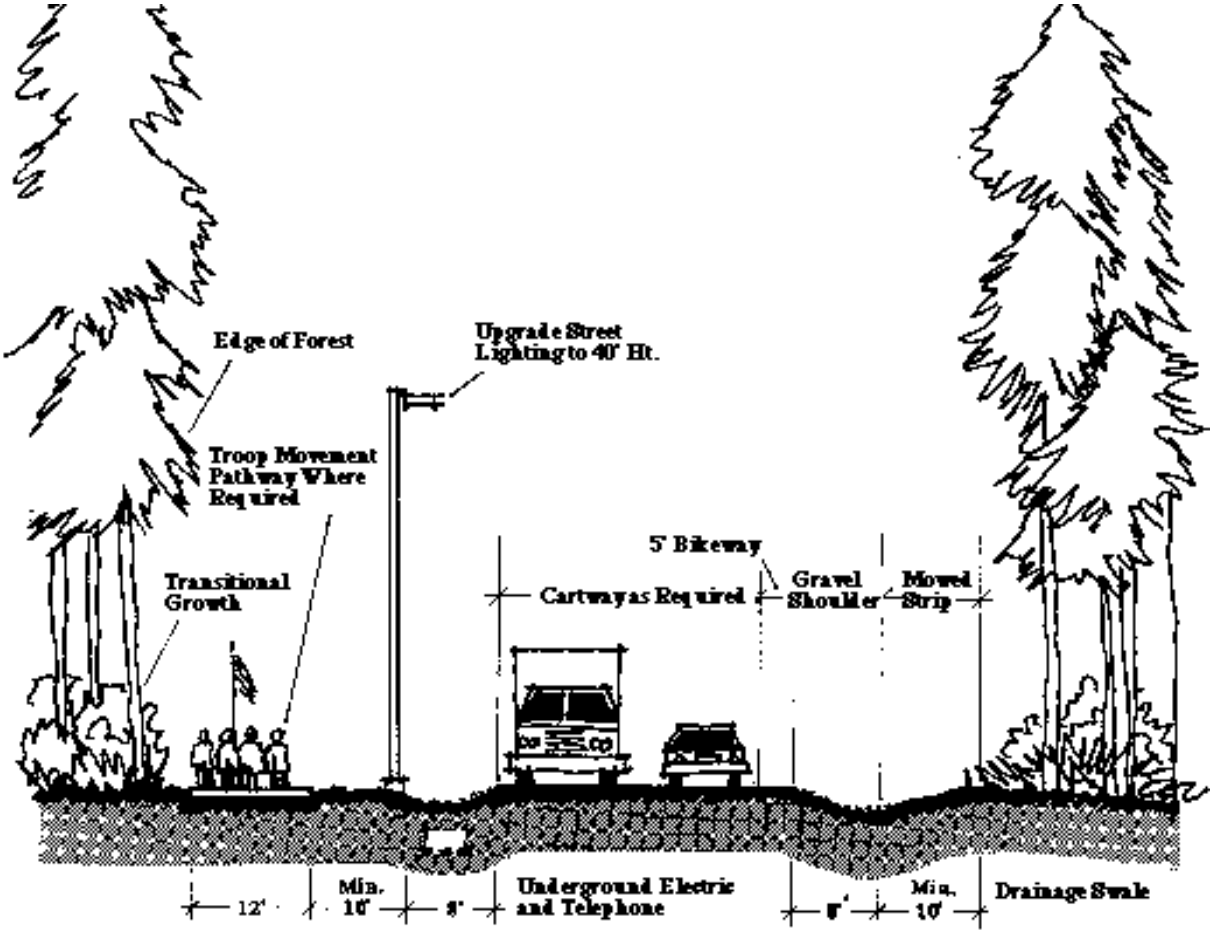
☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.1.7. Roadway Cross Sections FH OS

6.1.7.3. Saratoga Drive

General Notes

Saratoga Drive will connect to the new 6th Street Gate and provide a loop connection to Adams Avenue at the north and south. The roadway provides a pleasant drive through the forest as well as providing access to residential areas and field training facilities. Landscaping, lighting and signage should all be designed to reinforce the forest-like setting (see appropriate Design Criteria). (See FL. 6-14)



FL. 6-14 Saratoga Drive Section

6.1 Site Planning 1.4.4

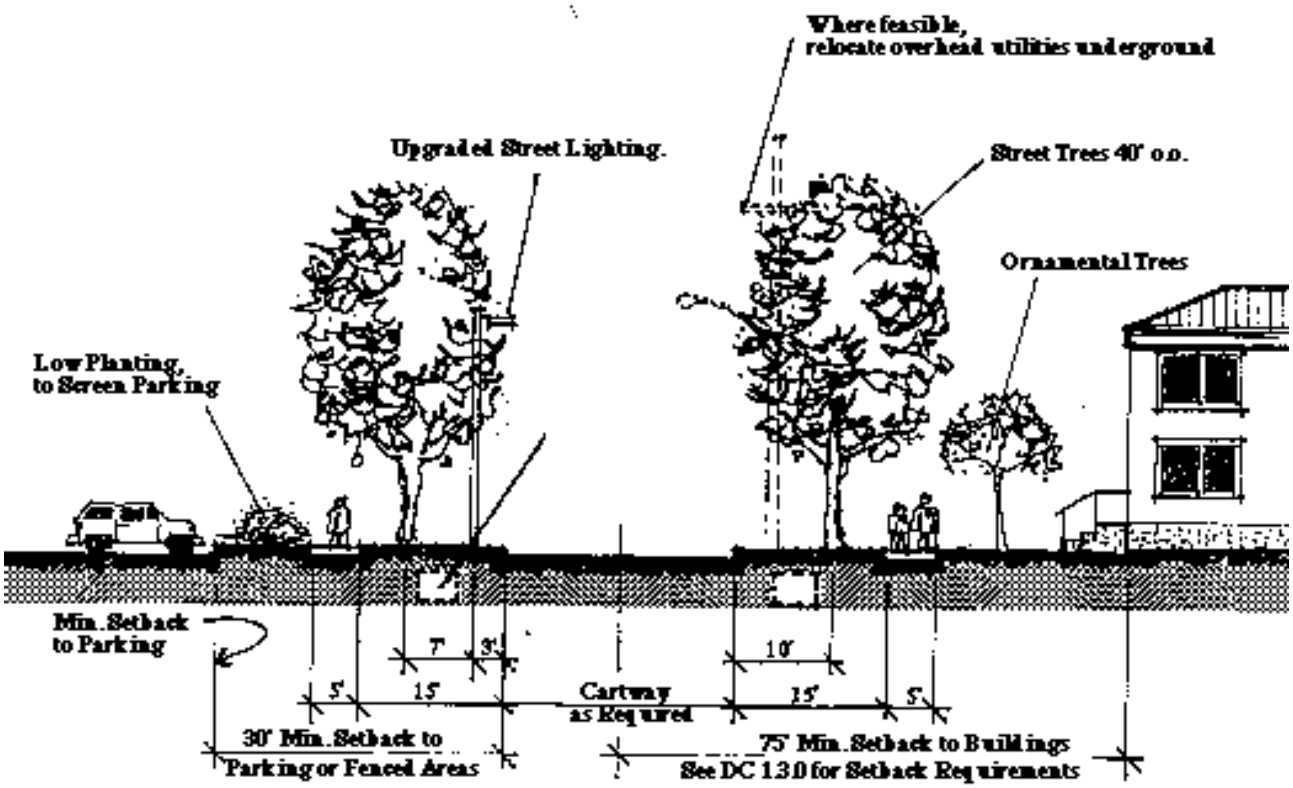
6.1.7. Roadway Cross Sections LT CC

6.1.7.4. Secondary Roadways

6.1.7.4.1. Living/Training Area

This design criteria applies to roadways in the vicinity of troop barracks and other nearby areas. Setbacks for new construction are to be applied to all streets (including tertiary roads). See DC 1.3 for required setback distances. Lighting, landscaping, and signage should all contribute to an improved visual impression (see appropriate Design Criteria).

All deep drainage ditches should be replaced with underground piped storm water drainage systems, where feasible.
(See FL. 6-15)



FL. 6-15 Conceptual Road Section

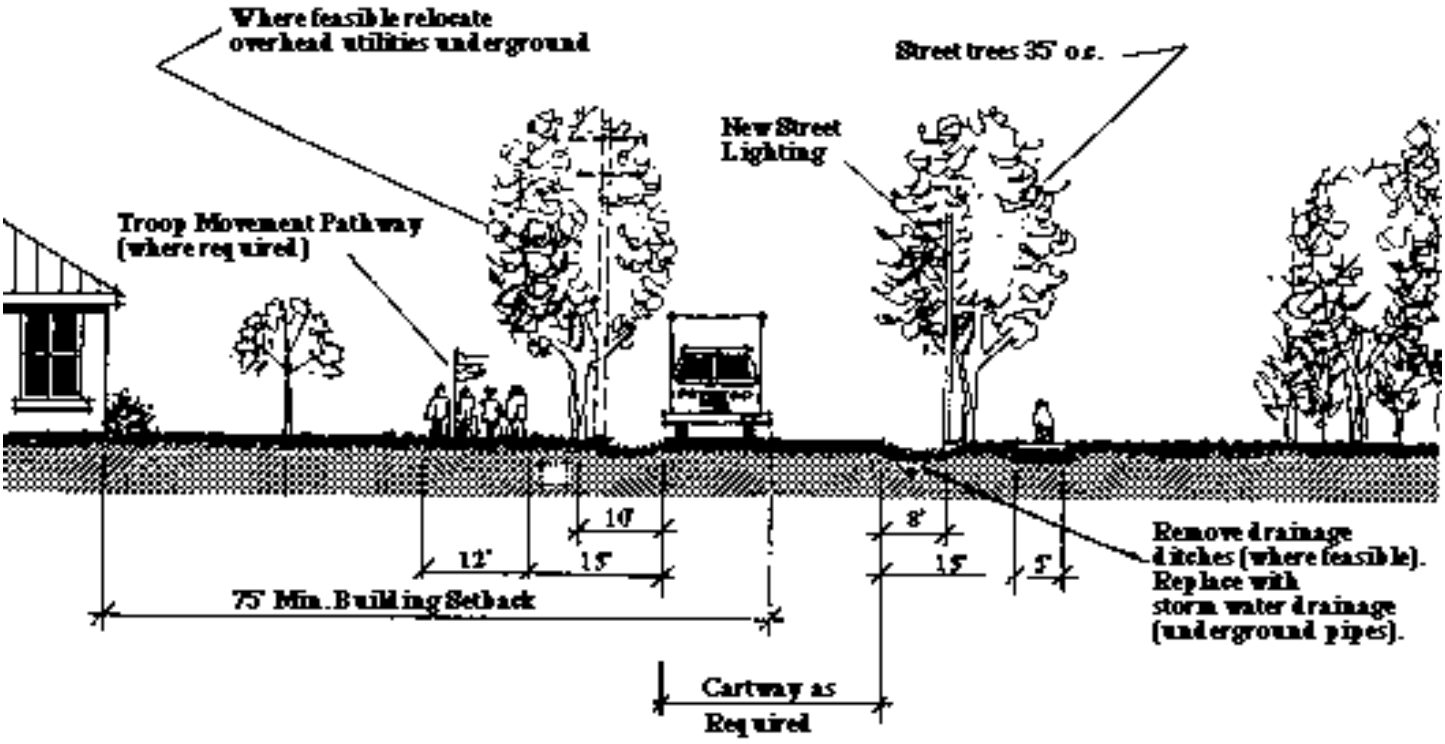
6.1 Site Planning 1.4.5

6.1.7. Roadway Cross Sections SS TF

6.1.7.4.2. Shop Road

This design criteria applies to all secondary roads throughout the post (unless specifically targeted by another street design criteria). (See FL. 6-16)

Design and location of utilities, street trees, sidewalks and signage form the image of the post along the secondary roadways.



FL. 6-16 Conceptual Road Section

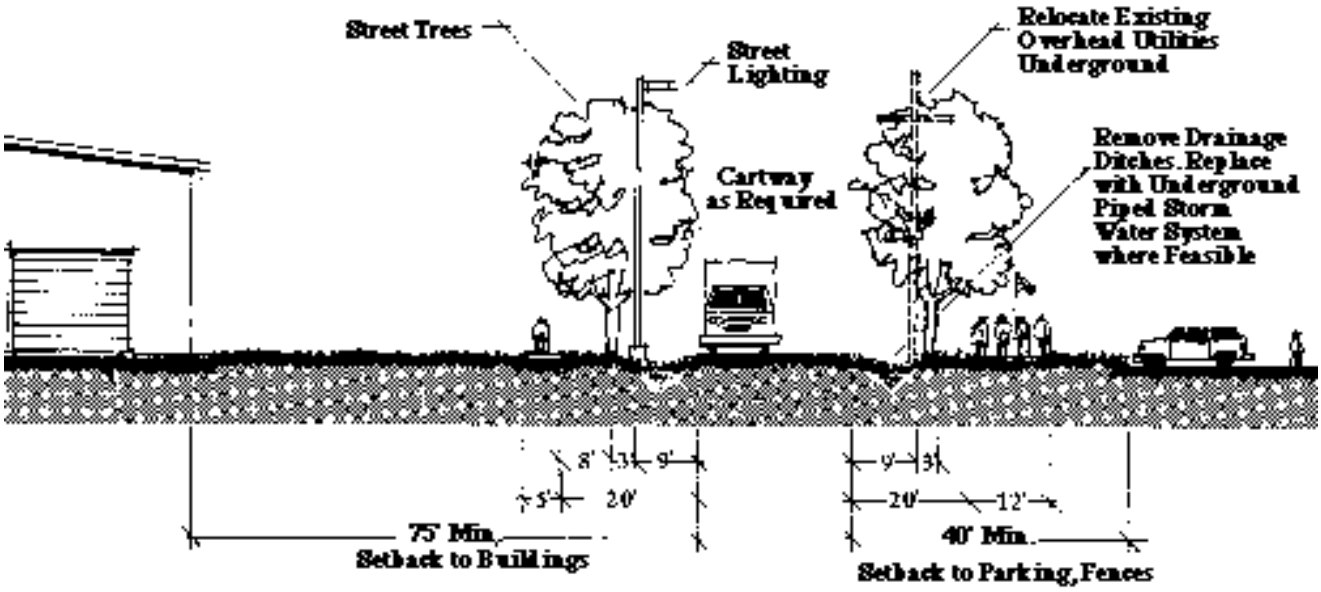
6.1.7. Roadway Cross Sections LT SS TF

6.1.7.5. Tertiary Roads

General Notes

The design of the roadways, lighting, pedestrian system (walking and troop movement pathways), signage and landscaping all contribute to a positive visual impression. Even roads classified as tertiary in the roadway hierarchy should be carefully considered. (See FL. 6-17 and FL. 6-18)

FL. 6-17
Rear Access Road is tertiary roadway.



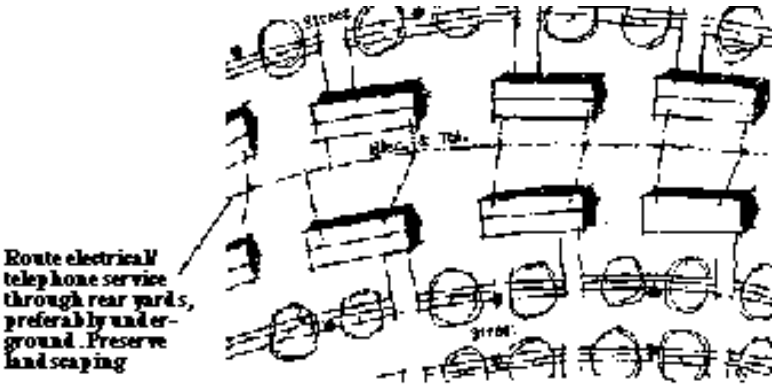
FL. 6-18 Conceptual Road Section

6.1 Site Planning 1.4.7

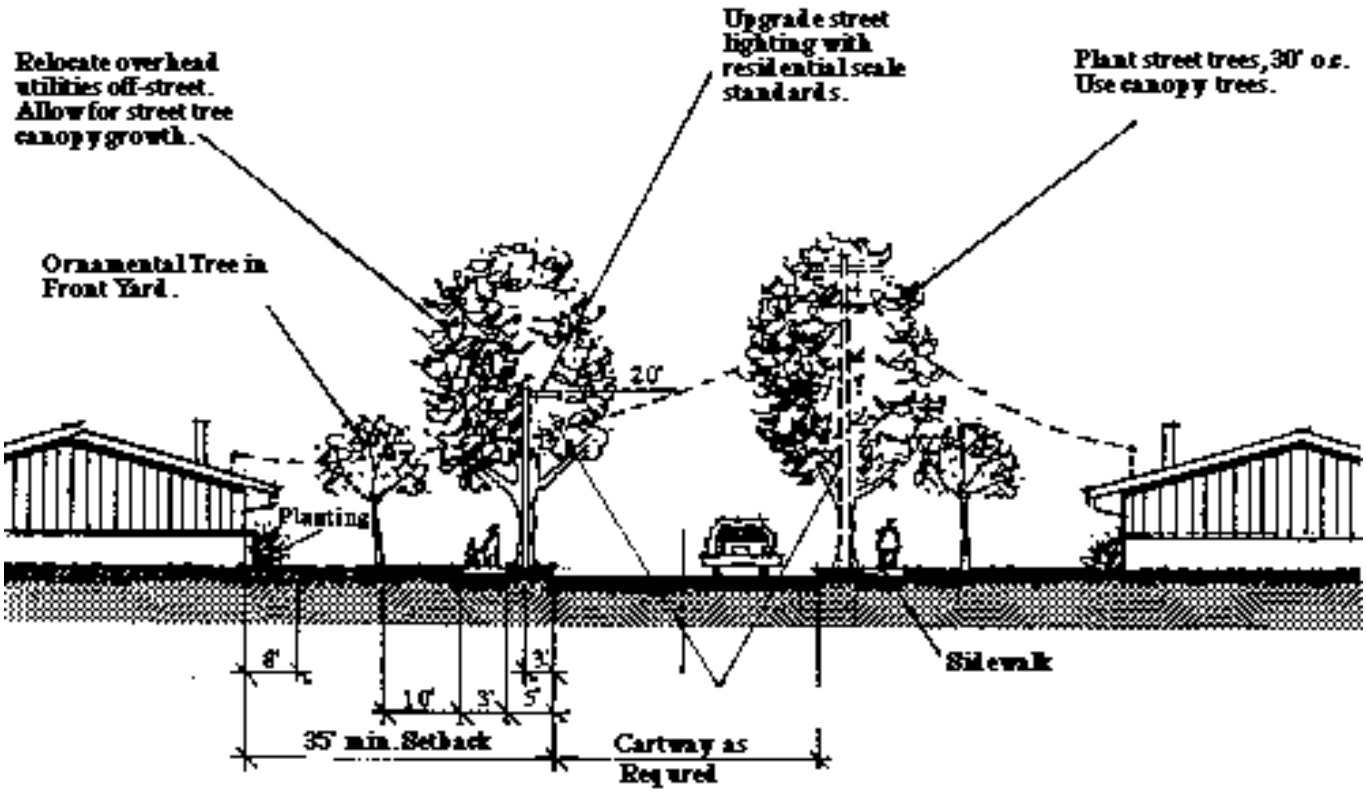
6.1.7. Roadway Cross Sections FH

6.1.7.6. Residential Streets

This design criteria applies to all residential streets in family housing neighborhoods throughout the post.
(See FL. 6-19 and FL. 6-20)



FL. 6-19
Residential Street Plan



FL. 6-20 Residential Street Crossection

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.1 Site Planning 1.5.1

6.1.8. Troop Movement Spine LT

General Notes

6.1.8.1. Byrd Avenue

Portions of Byrd Avenue are to be converted to a troop movement spine. This entails removing vehicular traffic from that street and rebuilding it for the exclusive pedestrian use of troops.
(See FL. 6-21)

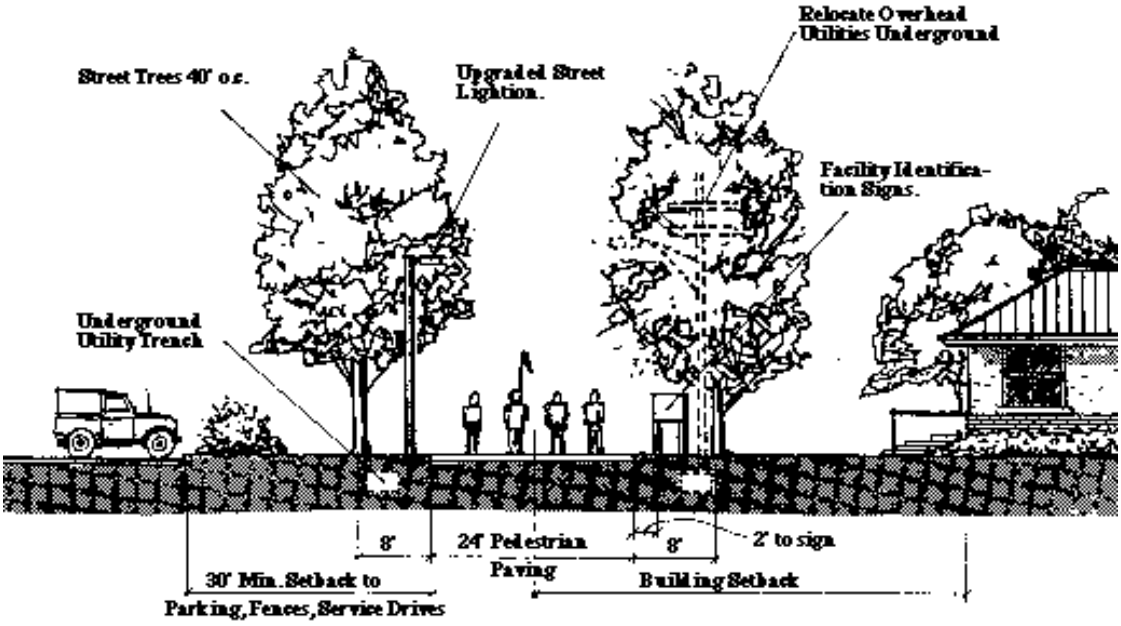
Cross streets are to be minimized. Where they occur, special crossing treatment is to be used. ,

The street is to be regraded (sloped 1% to drain to sides) and paving is to be bituminous material with concrete banding (see DC 3.7). Lighting is to be upgraded (see DC 5.1). Overhead utility wires are to be placed under ground.

Deep drainage ditches are to be replaced with underground piped stormwater system.
(See FL. 6-22)

FL. 6-21

Byrd Avenue should be converted into a troop movement spine.



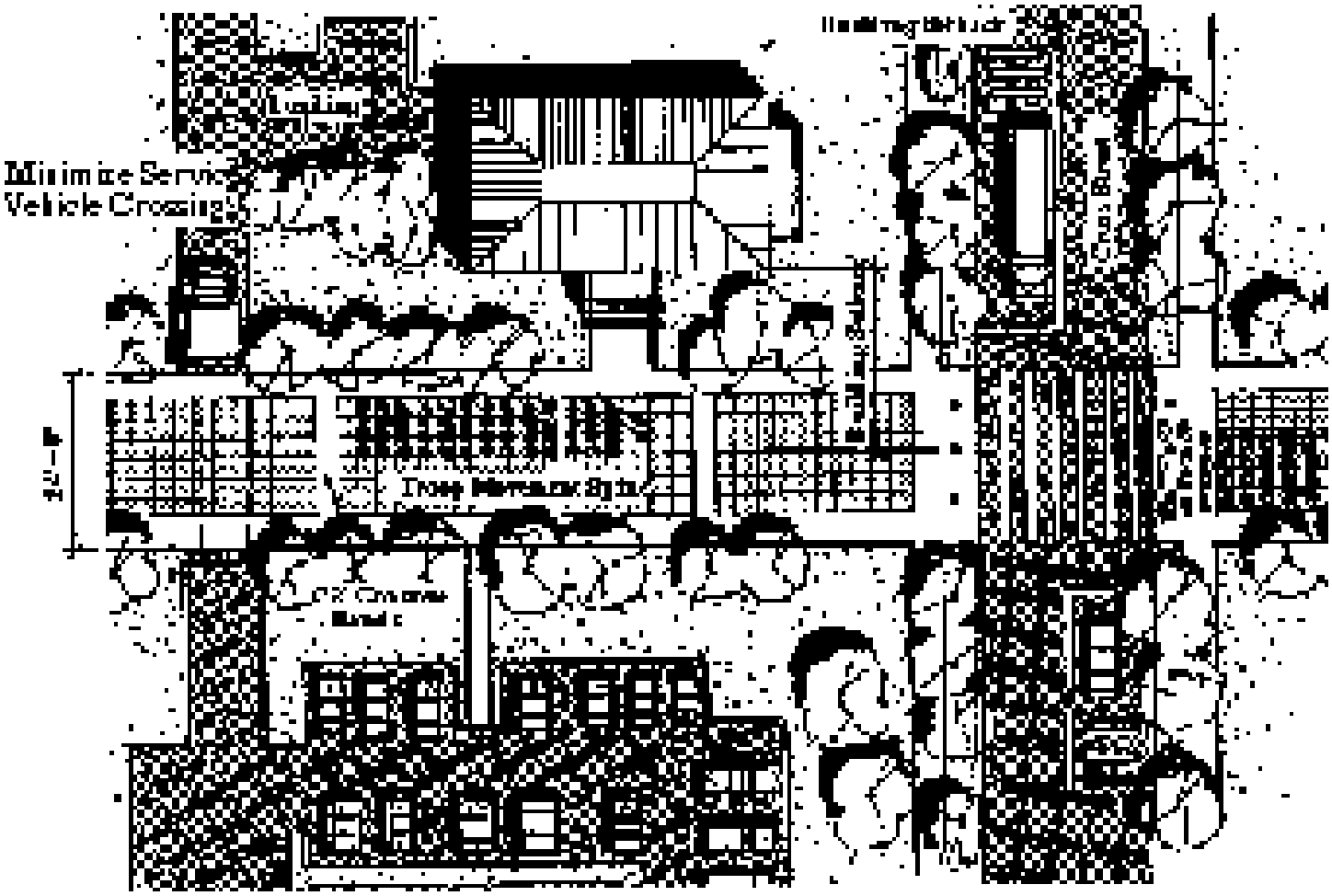
FL. 6-22 Troop Movement Spine Section

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.1 Site Planning 1.5.2

6.1.8. Troop Movement Spine LT

The Troop Movement Spine along Byrd Avenue will represent the primary pedestrian movement system within the Living/Training Zone. Special paving materials and street furnishings are noted in their specific Design Criteria later in this document.
(See FL. 6-23)

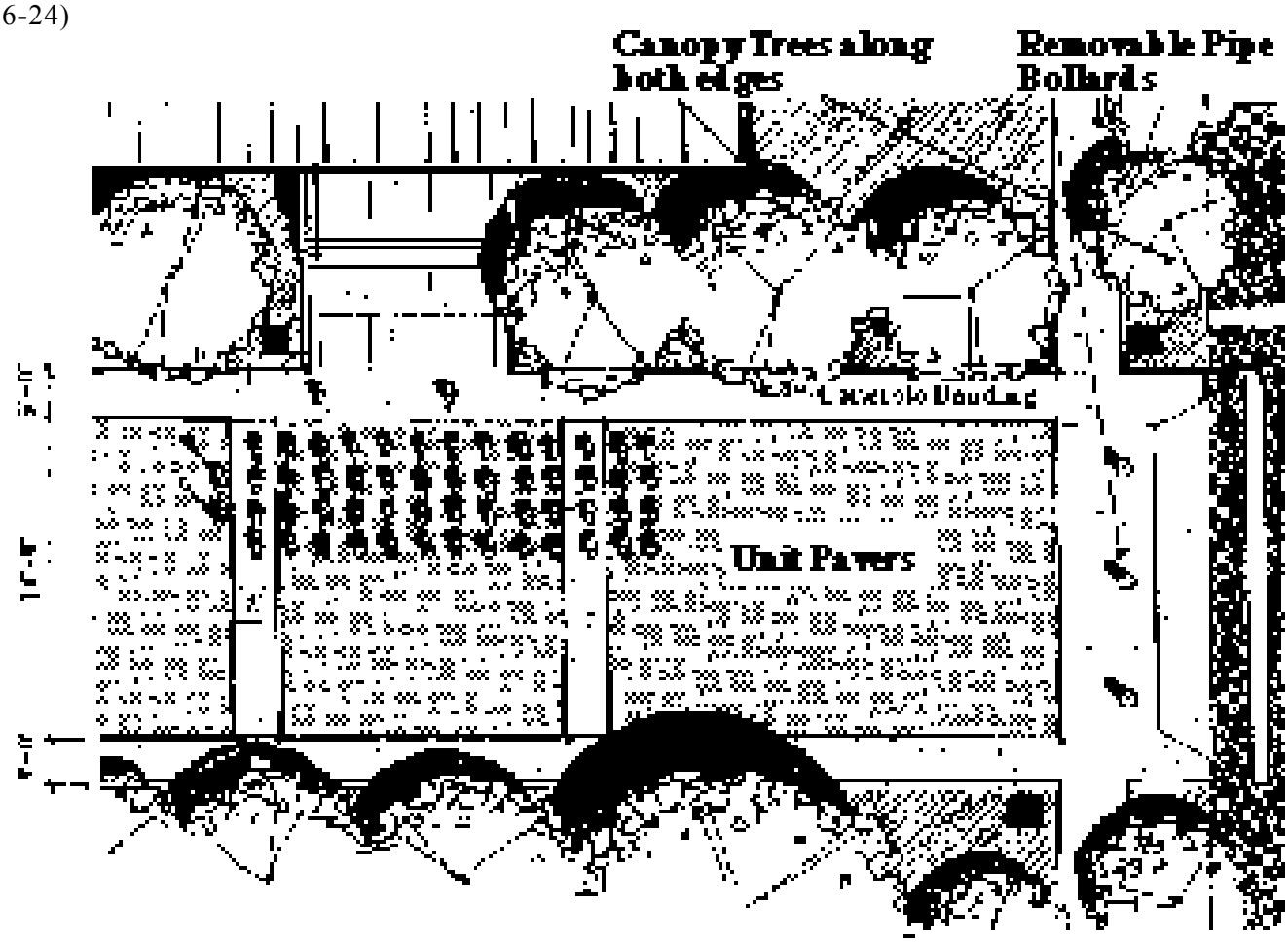


FL. 6-23 Troop Movement Spine Plan

6.1 Site Planning 1.5.3

6.1.8. Troop Movement Spine LT

The treatment of the Spine should create a pedestrian environment that forms the central axis of troop activities and movement along Byrd Avenue. The space should be large enough to permit platoons to pass in two directions, but not too wide to create a lifeless space. Large canopy trees and landscaping at the Spine edge and against buildings should frame the pedestrian space.
(See FL. 6-24)



FL. 6-24 Detailed Plan of Troop Movement Spine

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.1.8. Troop Movement Spine

LT SS OS CC

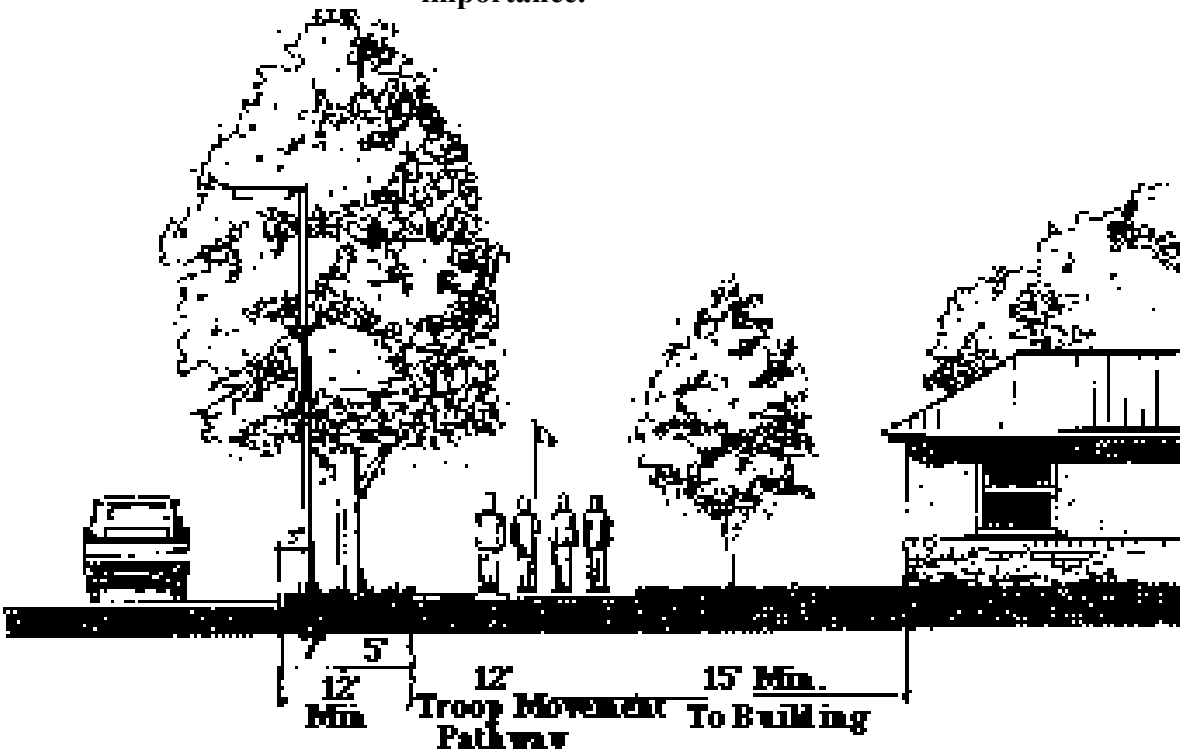
6.1.8.2. Developed Areas

A Troop Movement Pathway system should be established to link troop housing, activity and training areas (i.e. along Shop Road). A 12' wide bituminous pathway with special treatment at intersections should be developed. A removable steel pipe bollard should be located at the intersections, centered in the pathway, to obstruct vehicles using the pathway. (See FL. 6-25)

The Troop Movement Pathway represents a less intensively developed pedestrian system than the Troop Movement Spine. (See FL. 6-26)

FL. 6-25

Accommodations for troop movement is of vital importance.



FL. 6-26

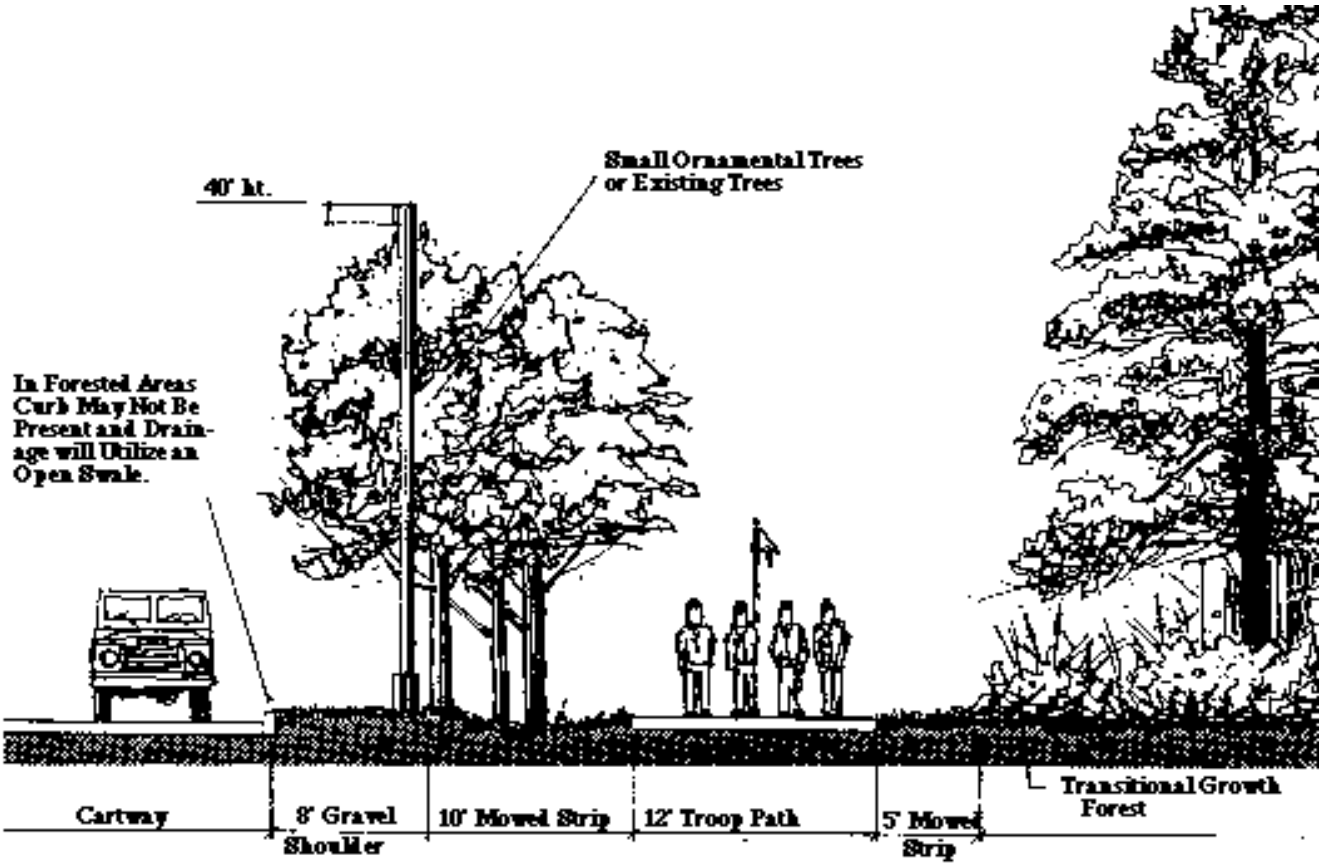
6.1 Site Planning 1.5.5

6.1.8. Troop Movement Spine OS FH

6.1.8.3. Forested Areas

A Troop Movement Pathway System should be established to link troop housing, activity and training areas (i.e. along Saratoga Drive). A 12' wide bituminous pathway should be developed adjacent to roadway (min. 18' from edge of road) and at edge of forested area. Special treatment should be utilized where pathway intersects roadways (see appropriate Design Criteria). (See FL. 6-27)

The Troop Movement Pathway represents a less intensively developed pedestrian system than the Troop Movement Spine.



FL. 6-27 Troop Movement Pathway Section

6.1.8. Troop Movement Spine

GW LT CC SS TF FH OS

6.1.8.4. Bike Path

Bikeway paving materials are to be bituminous with a brown/red colored aggregate to differentiate it from troop movement and roadway bituminous pavements.

Possible locations would include:

* Right of Ways
* Abandoned RR R.O.W.
* Fire lanes
* Recreational Areas
* Along roadways and highways

Bike Rack Locations

* Adjacent to rear entrances of destinations

* Out of pedestrian pathways

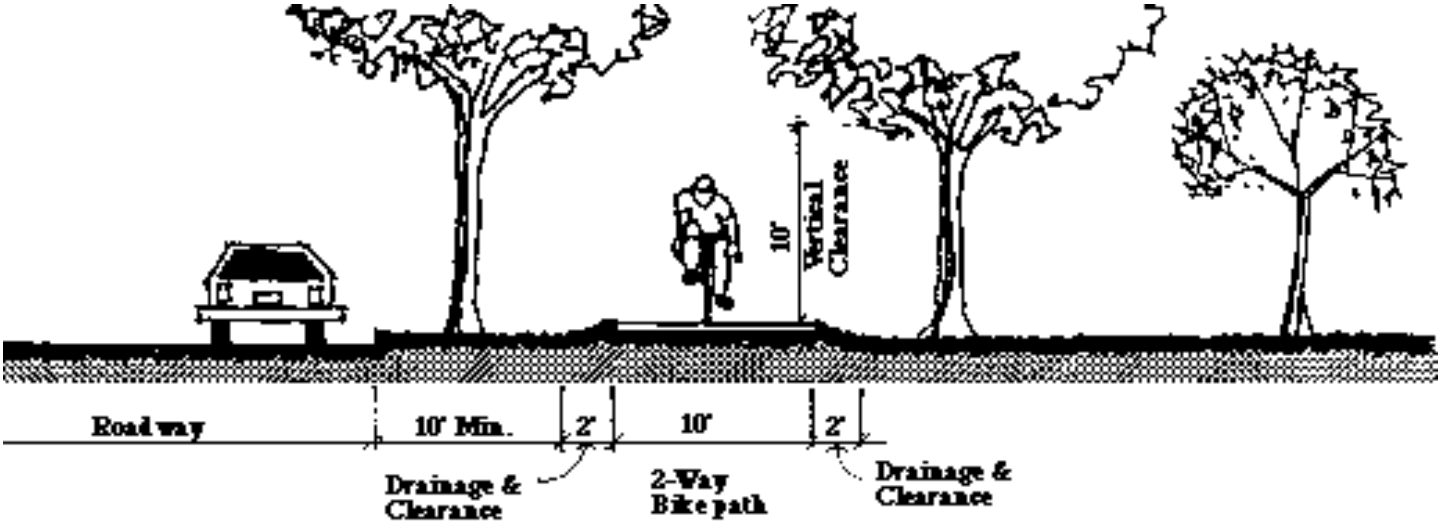
* In areas of constant visual supervision. (See FL. 6-28)

Bike path gradients

* Maximum gradient- 5% up to 1000 ft.

* Up to 10% may be used for 60 ft. maximum.

* Bike path curve radii are to correspond to design speed and gradient.



FL. 6-28 Bike Path Section at Roadway Edge

6.1.8. Troop Movement Spine

GW LT CC SS TF FH OS

6.1.8.5. Bikeway System - Details

One-Way System - One Side Only

* Provide a 5'-0" wide bicycle lane within the street cartway on one side of street.

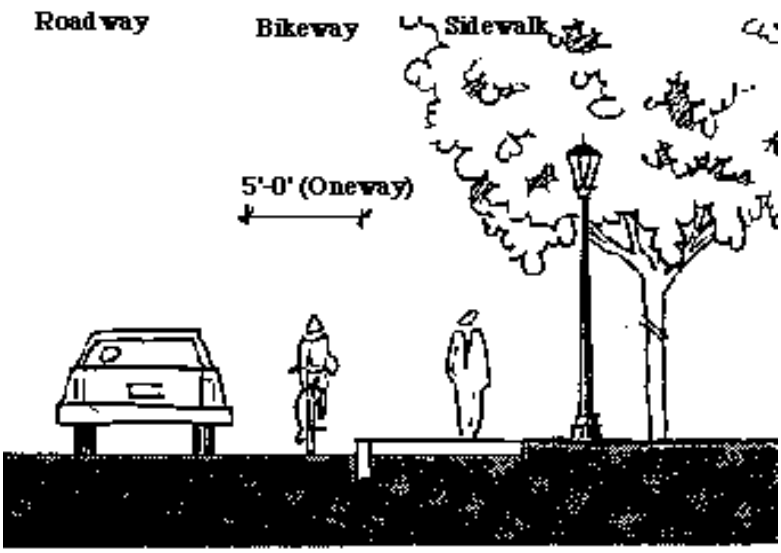
* Maintain bicycle lane consistently on same side of street avoiding crossovers.

* Use diagonally painted striping to demarcate the extent of bikeway lane. (See FL. 6-29)

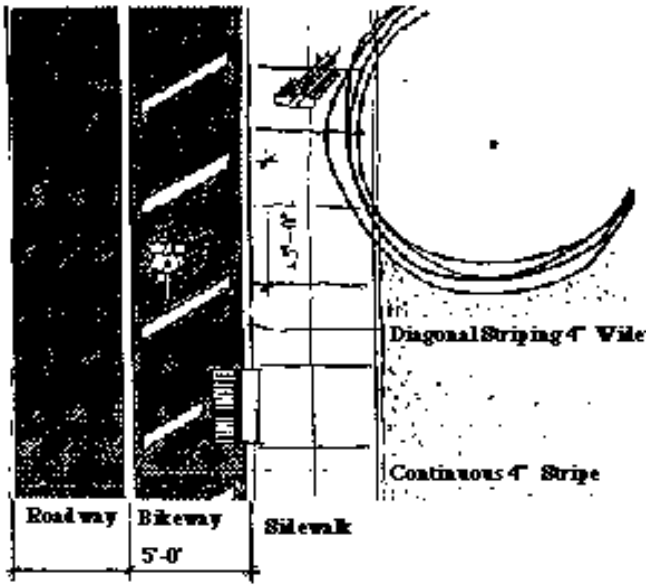
Two-Way System -- Both Sides of Street.

* Same as above, except use 5' wide bikeway lane on both sides of street.

* Utilize bike-proof storm water inlet grates. (See FL. 6-30)



FL. 6-29
Bikeway Street Cross Section



FL. 6-30
Bikeway Plan View

6.1 Site Planning

6.1.9. Access to Buildings

GW LT CC SS TF FH OS

(Page 1 of 2)

The parking lot is often the arrival point for the visitor. Although a major building front entry may be oriented to the roadway, frequently it is the rear or side entrance that is used because it may be more convenient to the parking. (See FL. 6-31)

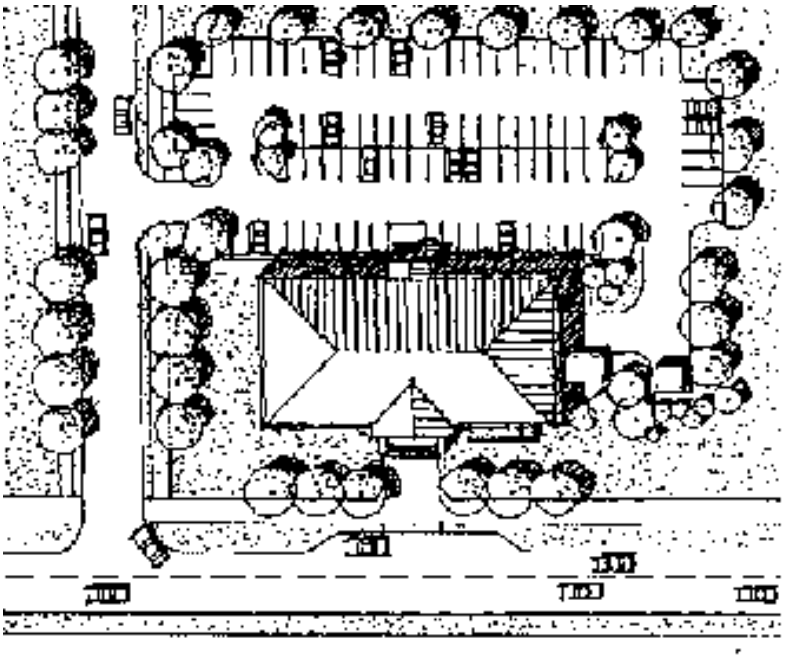
The proper siting and design of parking lots and the design of pedestrian spaces that lead from parking to the destination building are important to the overall impression of the installation, the following recommendations provide guidance for the siting and design of parking lots and related pedestrian amenities.

6.1.9.1. Parking in Rear

Parking is best located at the rear of buildings and facilities for effective screening of parking areas. Allow a 10-15' min. setback for a planting strip for trees and shrubs and pedestrian walkway between the parking area and back of the building. (See FL. 6-32)

FL. 6-31

Parking Lot behind Mifflin Hall Building, note the curbed planting islands.



FL. 6-32

Parking in Rear

6.1 Site Planning 1.6.0

6.1.9. Access to Buildings

GW LT CC SS TF FH OS

(Page 2 of 2)

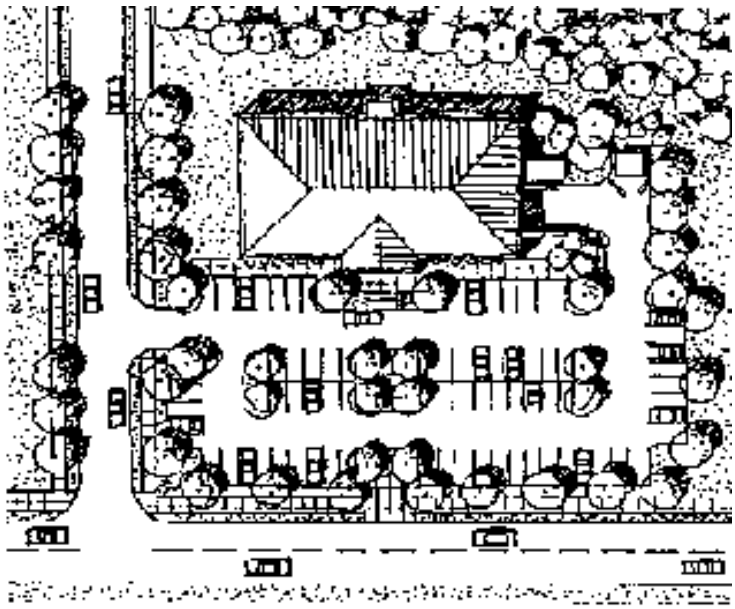
6.1.9.2. Parking in Front

This occurs at existing buildings requiring a high level of access and visibility with a high turnover in parking, such as at community support facilities. (See FL. 6-33)

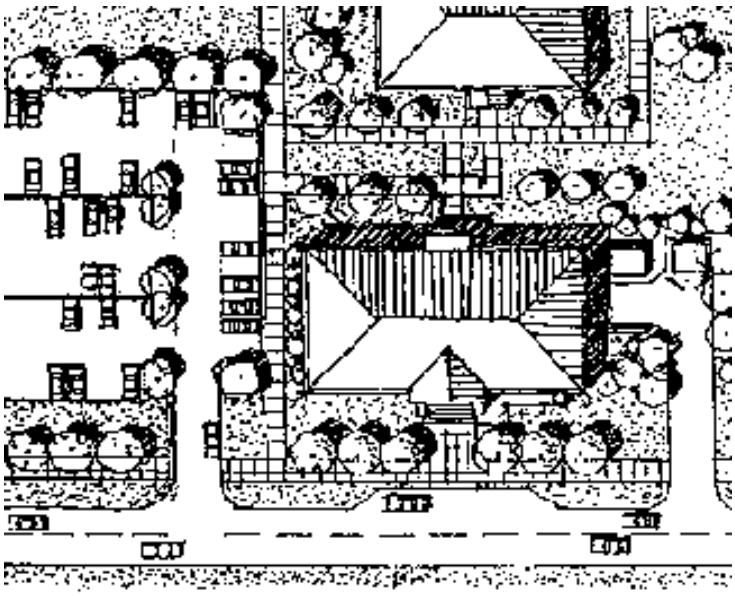
Existing parking in front of buildings should be maintained and improved; however, future parking in front of buildings should be discouraged in general. Locate new parking to the sides and rear of buildings instead.

6.1.9.3. Parking to Side

Recommended where several buildings share common parking field. Special consideration must be made for pedestrian pathways which direct visitors to the front entrance of the destination buildings. (See FL. 6-34 , FL. 6-35 , FL. 6-36 and
FL. 6-37)



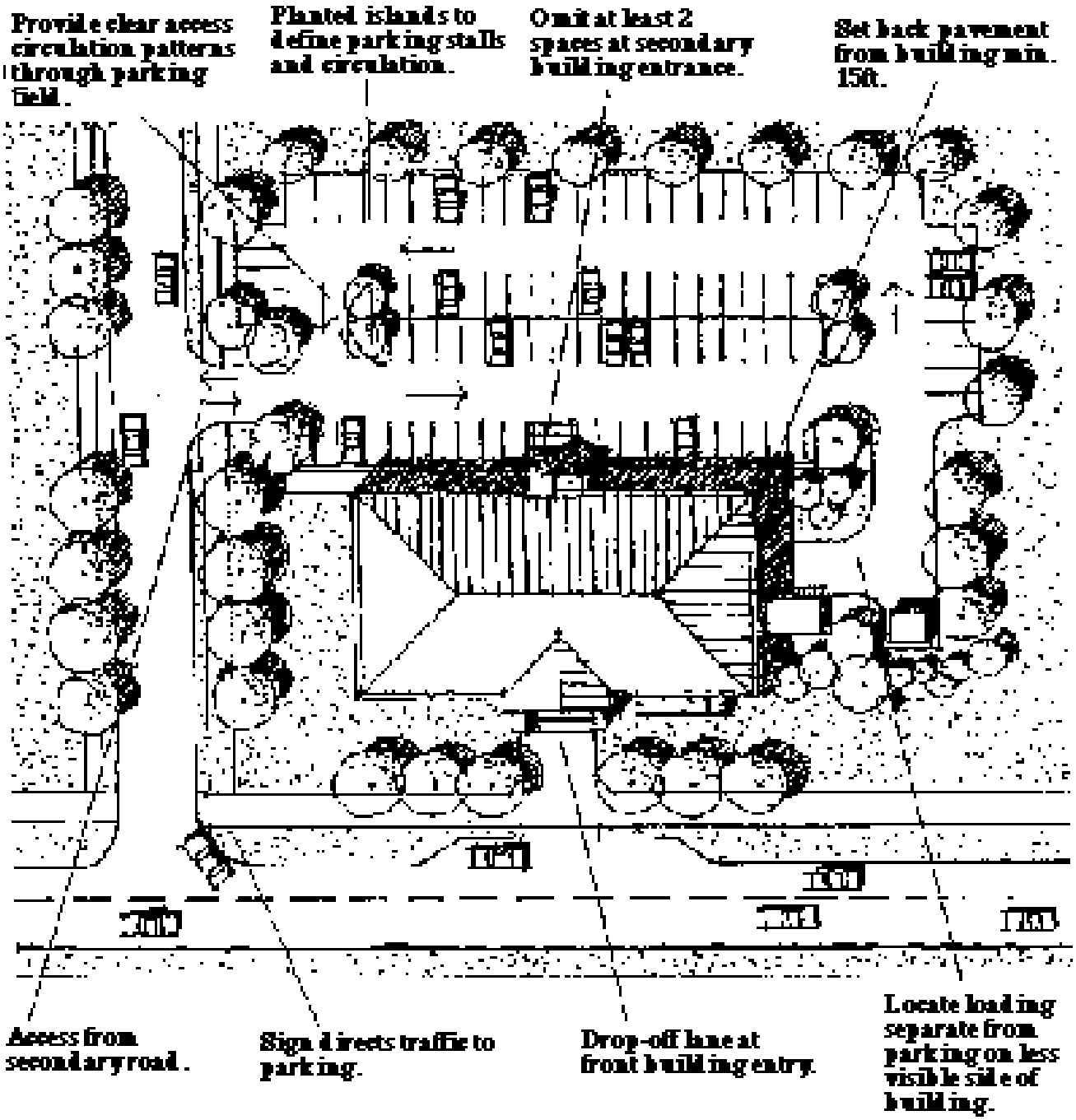
FL. 6-33
Parking in Front



FL. 6-34
Parking to Side

6.1.9. Access to Buildings GW LT CC SS TF FH OS

Parking in Rear

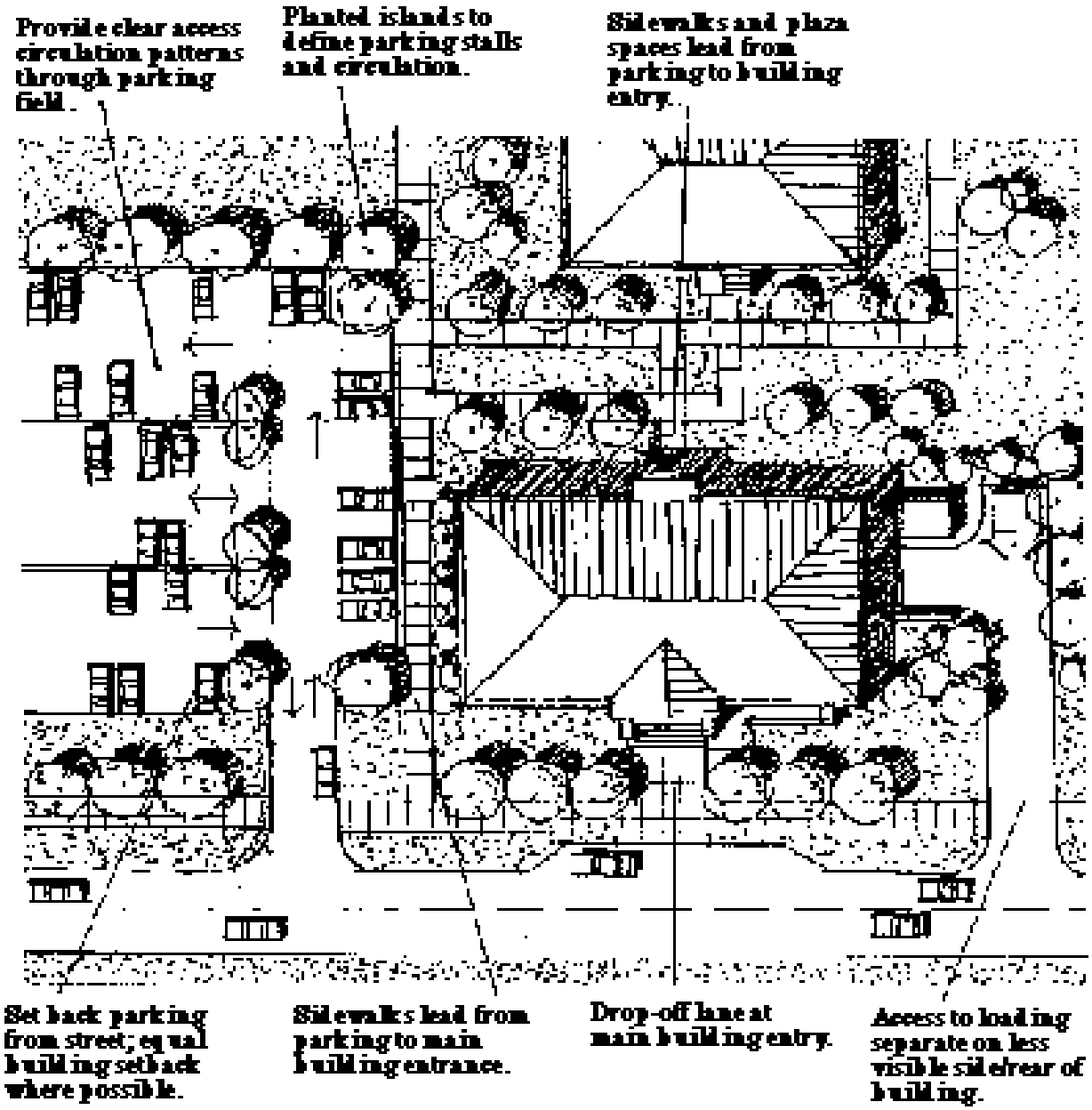


FL. 6-35 Conceptual Plan

6.1 Site Planning 1.6.2

6.1.9. Access to Buildings GW LT CC SS TF FH OS

Parking to Side



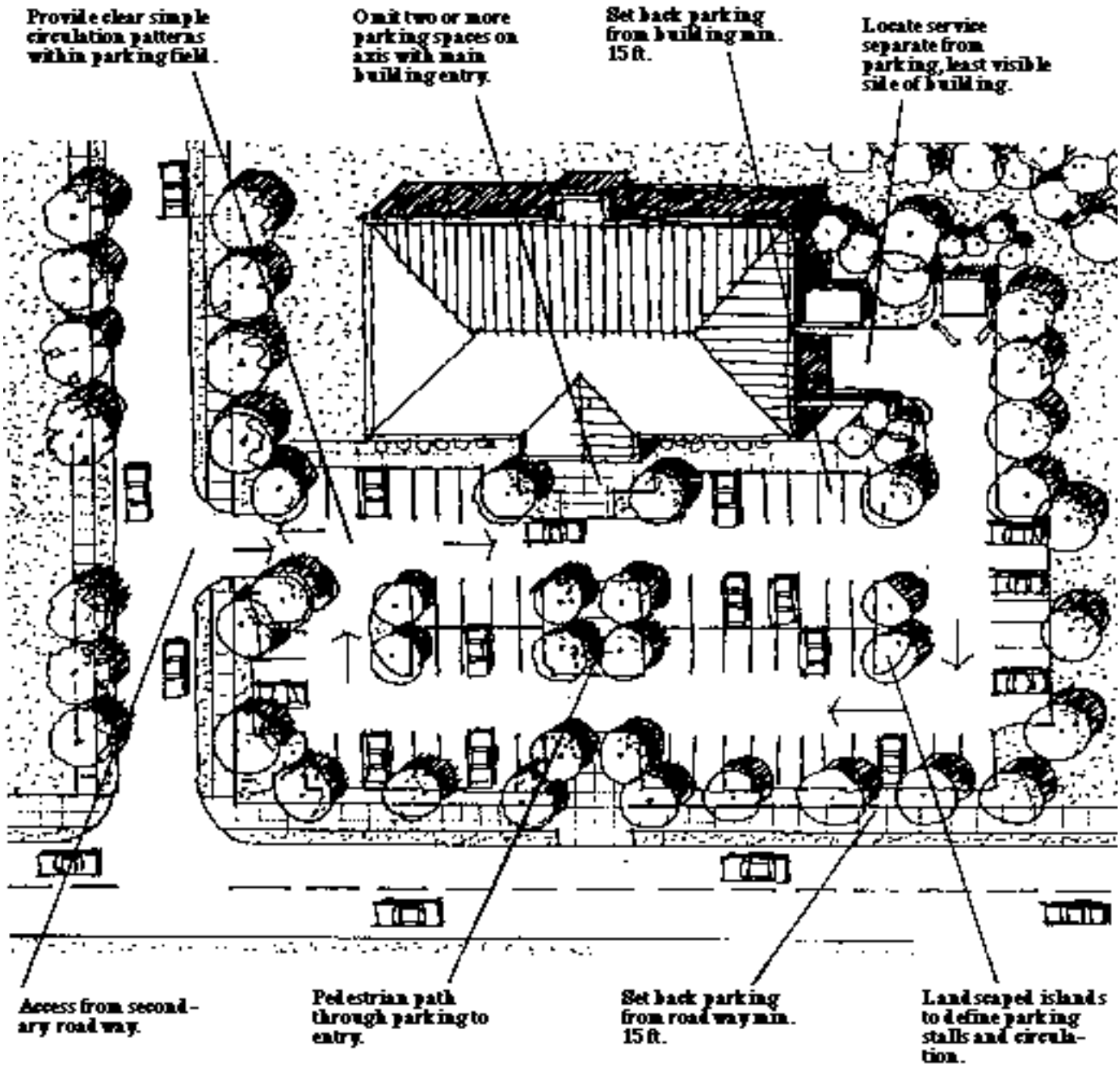
FL. 6-36 Conceptual Plan

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.1 Site Planning 1.6.3

6.1.9. Access to Buildings GW LT CC SS TF FH OS

Parking in Front



FL. 6-37 Conceptual Plan

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.1.10. Off Street Parking

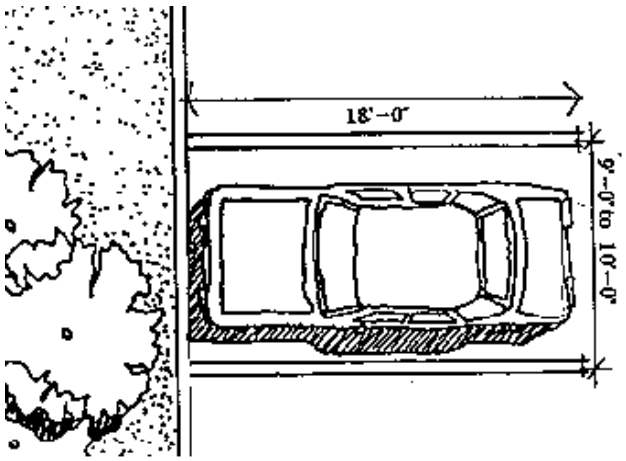
GW LT CC SS TF FH OS

6.1.10.1. Standard Dimensions

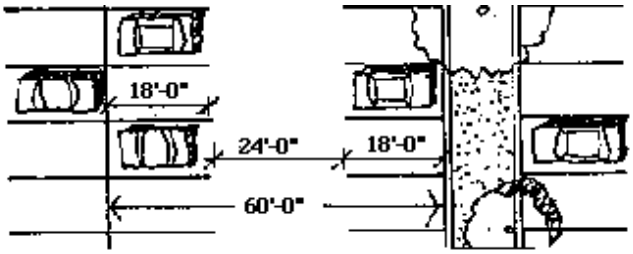
Individual stall size is to be 9'0" x 18'0". Parking lots with larger stall sizes should be restriped where their efficiency can be increased by doing so. The total width of each parking bay is to be 60 feet. (See FL. 6-38 and FL. 6-39)

Larger dimensions are permitted in less densely developed areas of the post, or in motor pool areas where trucks and service vehicles must be stored. However, the space efficiency of these too must be minimized insofar as possible.

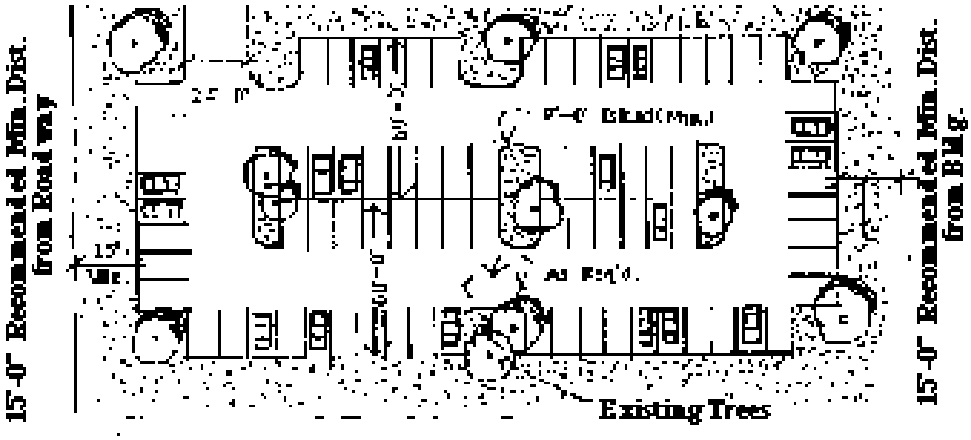
Parking lots must be held a minimum of 15' away from buildings and roadways wherever feasible. (See FL. 6-40)



FL. 6-38
Individual Parking Stall



FL. 6-39
Width of Parking Bay



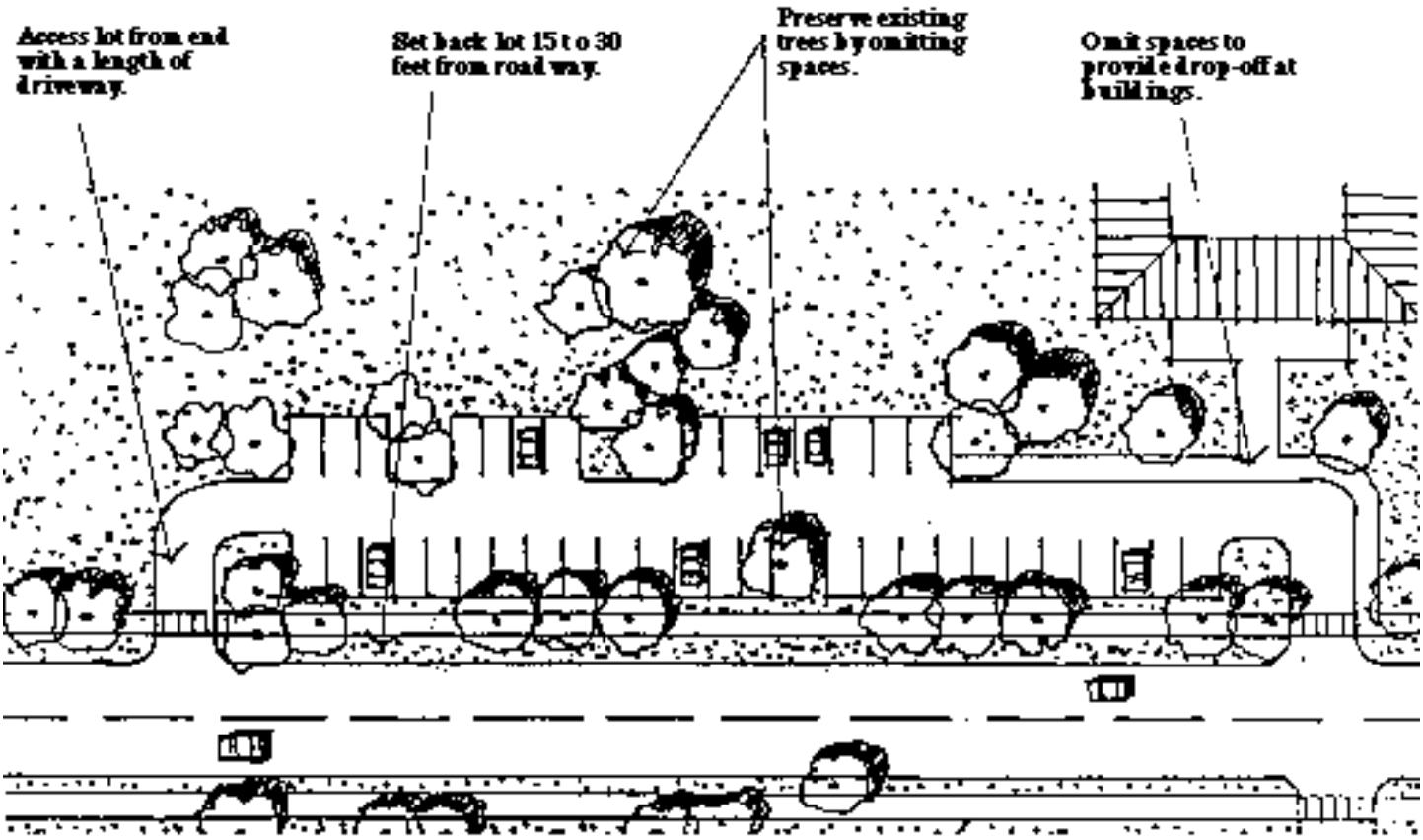
FL. 6-40 Conceptual Parking Layout

6.1 Site Planning 1.7.2

6.1.10. Off Street Parking GW LT CC SS TF FH OS

6.1.10.2. Small Lots

Often public perpendicular parking is located directly on streets. This is a dangerous and less than desirable condition. Wherever possible, parking should be separated from the street by a planting strip. Access points (curb cuts) should be kept to a minimum to facilitate through traffic movement. (See FL. 6-41)

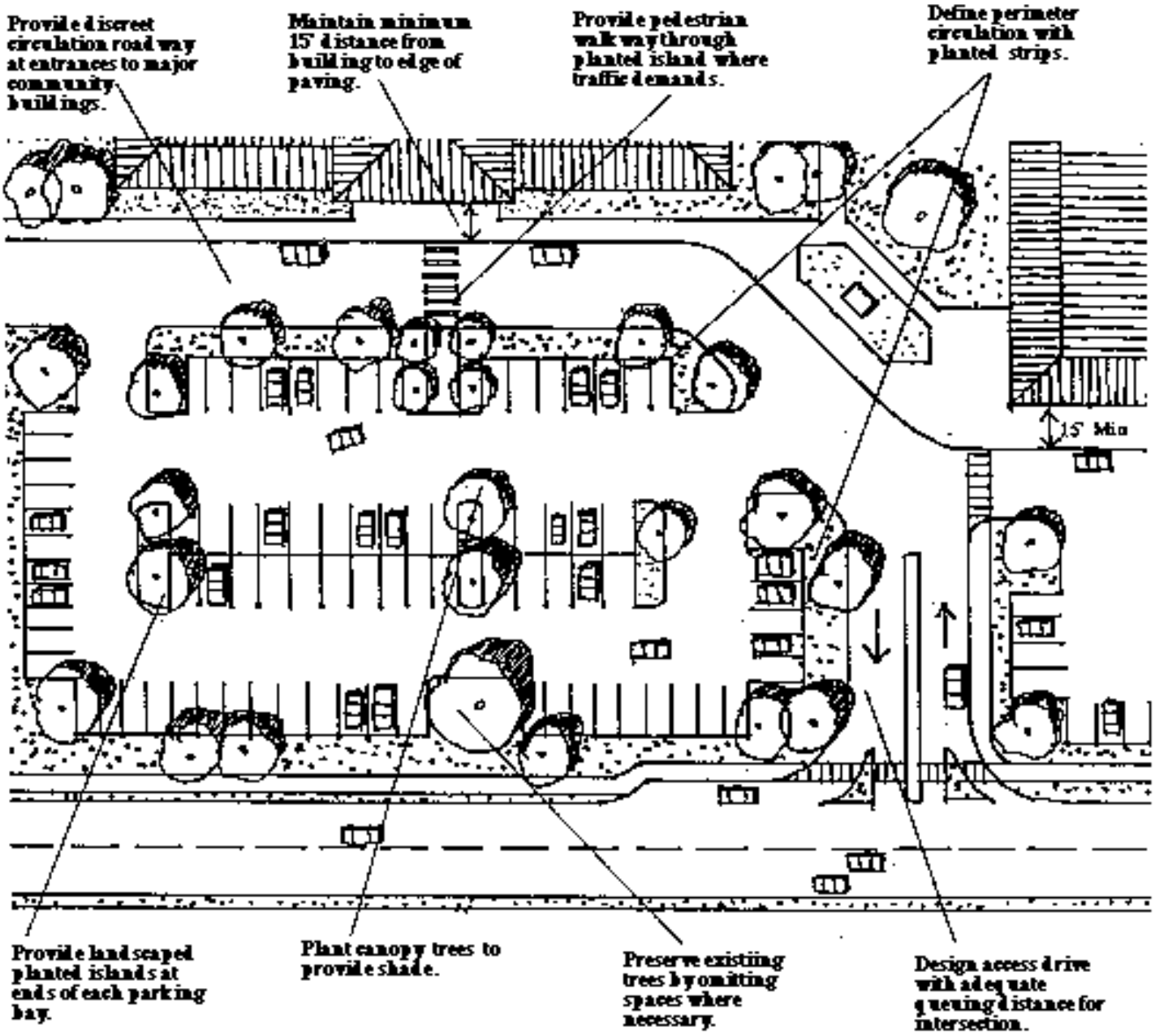


FL. 6-41 Conceptual Plan of Parking Improvements

6.1 Site Planning 1.7.3

6.1.10. Off Street Parking CC

6.1.10.3. Post Exchange (See FL. 6-42)



FL 6-42. Conceptual Plan of Parking Improvements

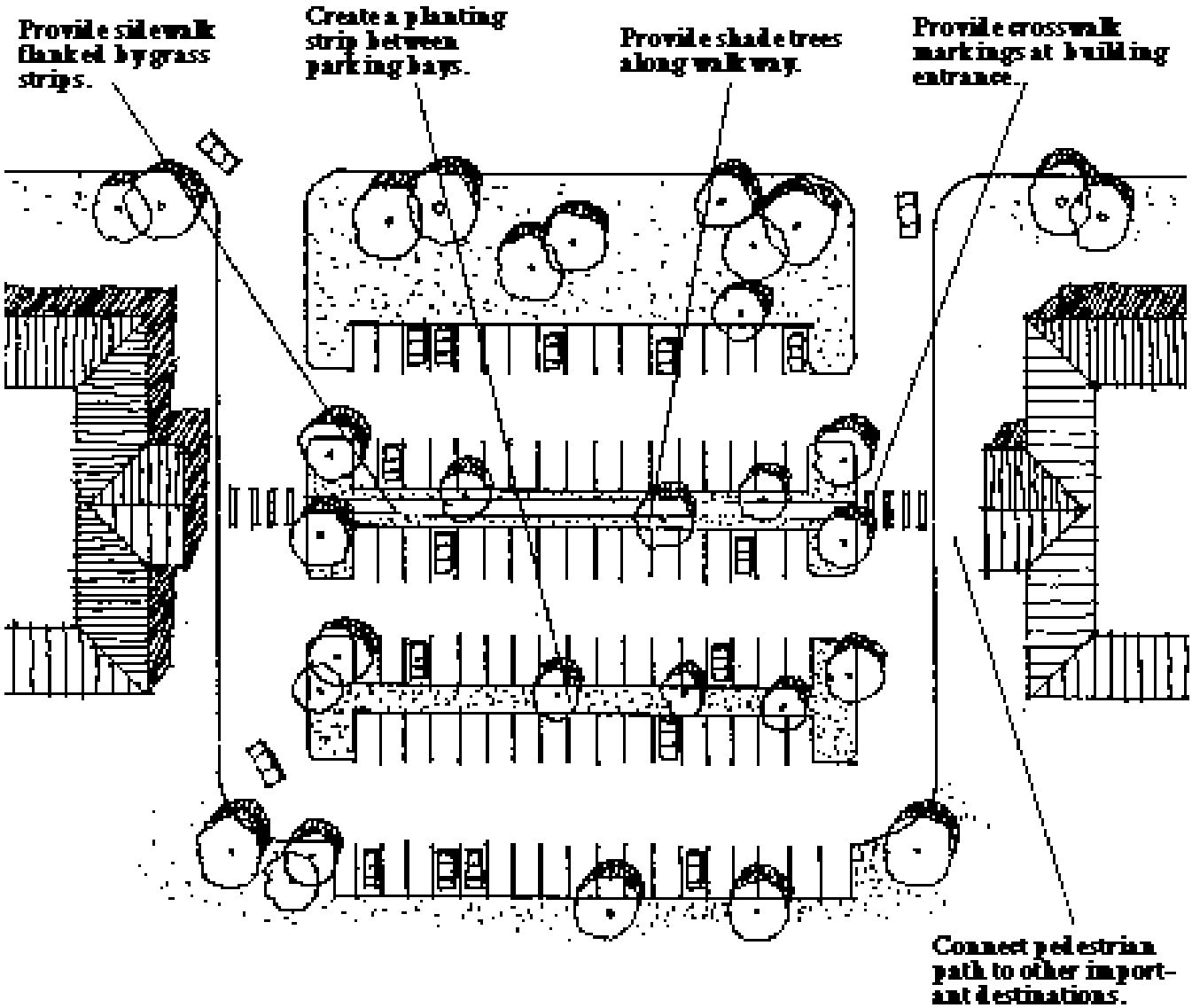
☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.1 Site Planning 1.7.4

6.1.10. Off Street Parking GW LT CC SS TF FH OS

6.1.10.4. Integrating Pedestrian Pathway

Frequently important destinations must be accessed by pedestrians through large parking fields. In these cases, a special pedestrian pathway is to be provided through the parking to the building entrance. (See FL. 6-43)



FL. 6-43 Conceptual Parking Plan

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.1 Site Planning 1.7.5

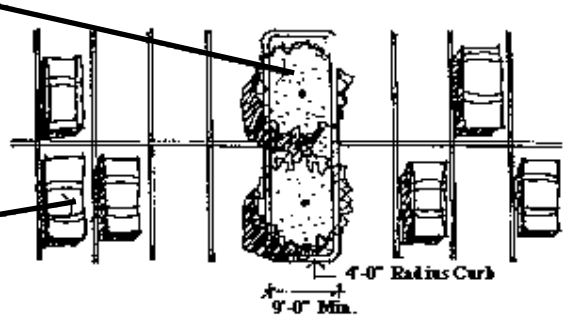
6.1.10. Off Street Parking GW LT CC SS TF FH OS

6.1.10.5. Parking Planted Islands

Provisions for landscaping must be made within larger parking lots. Planted islands are to be provided by omitting two parking stalls in adjacent bays.

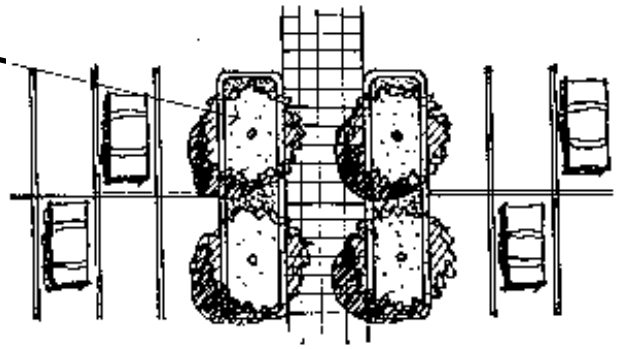
Canopy trees are recommended for planting to provide shade.

Recommend no more than 15 to 20 ~ spaces between plant islands.
(See FL. 6-44)



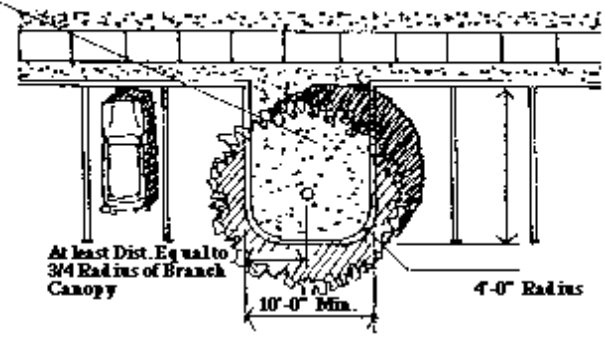
FL. 6-44
Planted Island

Use planted islands to define a pedestrian path leading to major building entries.
(See FL. 6-45)



FL. 6-45
Planted Island with Pedestrian Pathway

At perimeter of parking lots, omit single spaces to provide planting or to preserve existing trees.
(See FL. 6-46)



FL. 6-46
Perimeter Planting Bay

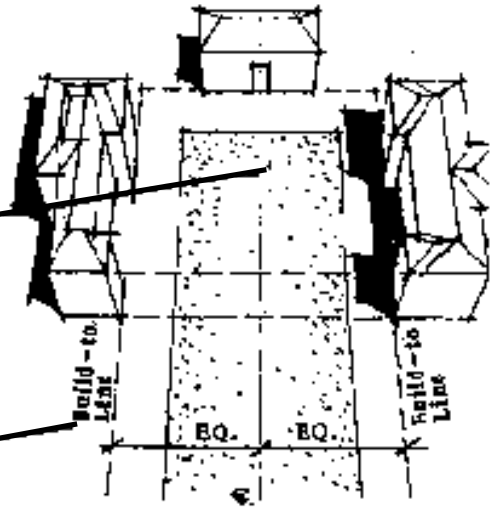
6.1 Site Planning 1.8

6.1.11. Buildings Flanking Formal Open Space LT TF

Formal open spaces are desirable and should be defined by the location, placement, and scale of surrounding buildings. In some locations, the elements of this type of space already exist and need only be completed by the careful planning of building locations and landscaping. In other areas a totally new configuration of building groups needs to be created.

* Center axis of open space establishes reference line for symmetric placement of buildings on both sides. (See FL. 6-47)

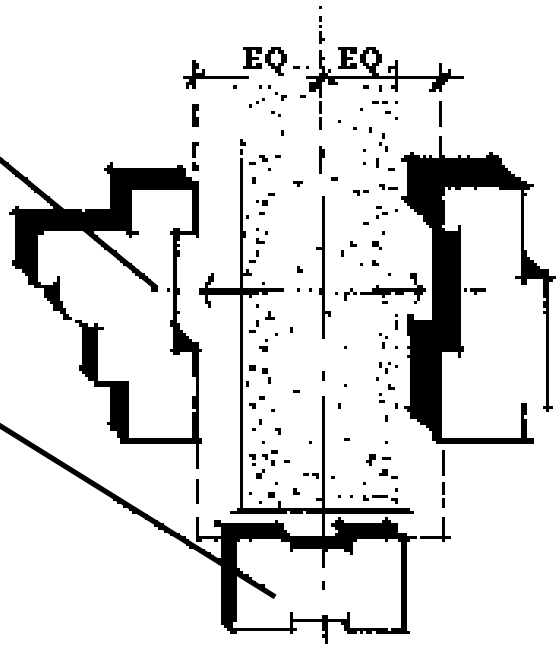
* Buildings to be set back equally on both sides of centerline.



FL. 6-47

* Building fronts facing each other on opposite sides of the space to be designed with similar massing and proportions where possible.

* Building located at end of axis should be designed with symmetrical facade with entrance or feature opening at center. Function of building should be of some importance. (See FL. 6-48)



FL. 6-48

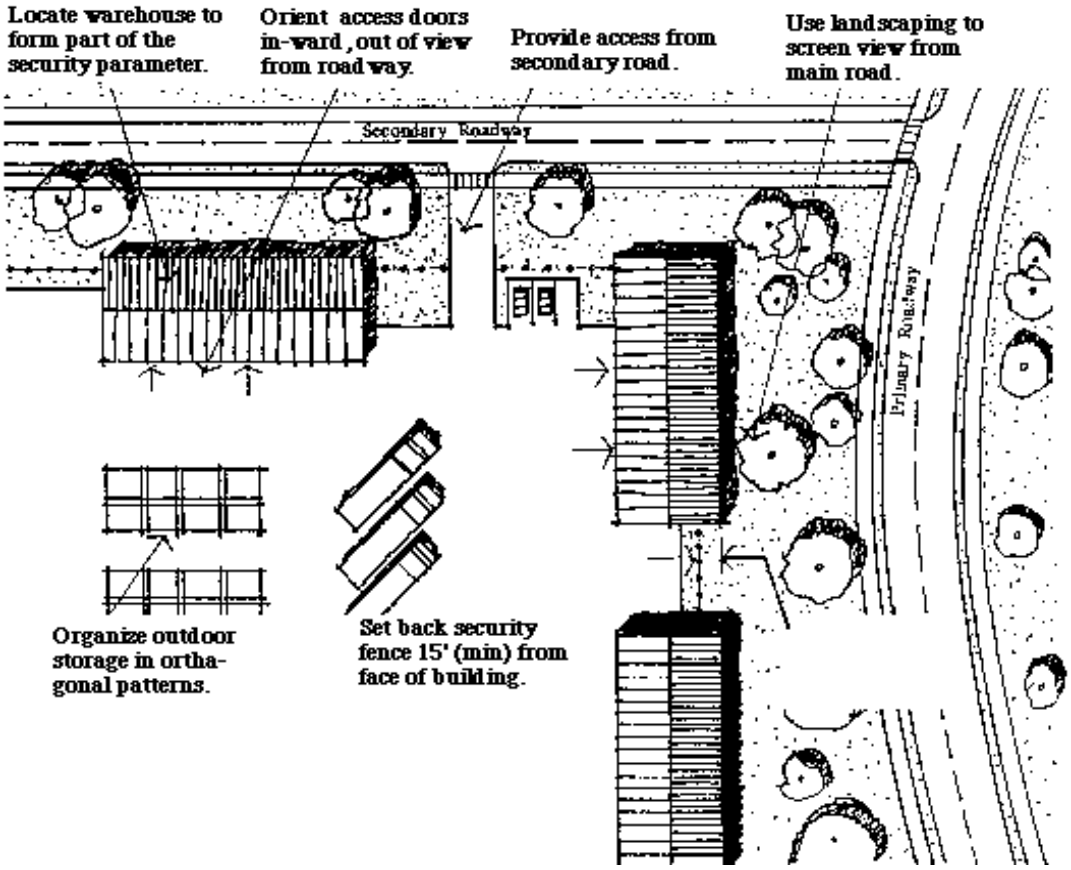
6.1 Site Planning 1.9

6.1.12. Warehouse & Storage Yards SS

Careful siting of warehouses and planning of fenced storage yards is essential to insure that these industrial functions are properly screened from more public areas. When locating storage facilities, the following guidelines should be considered.
(See FL. 6-49 and FL. 6-50)

FL. 6-49

View of warehouses should be screened from adjacent roadway.

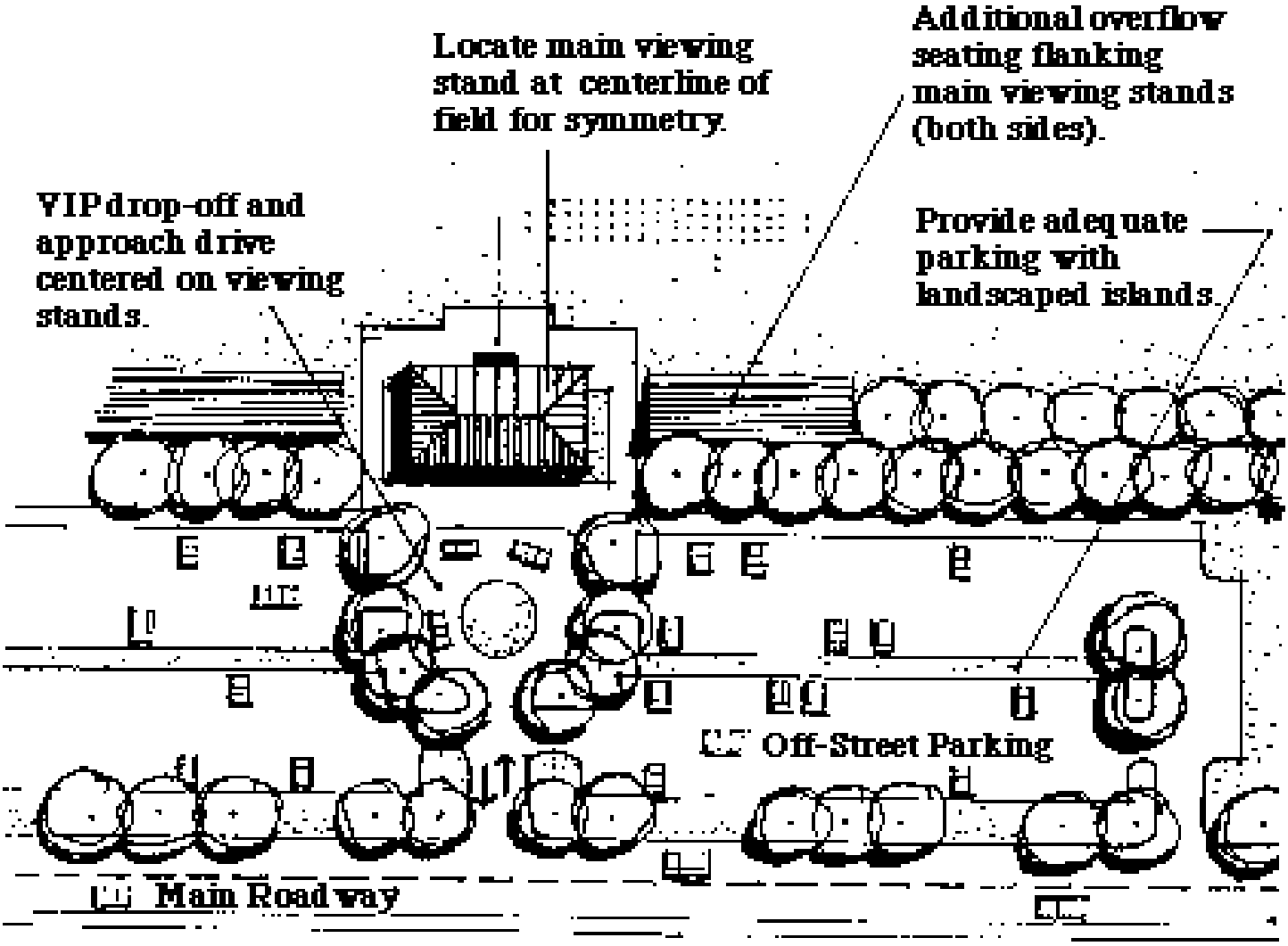


FL. 6-50 Conceptual Plan of Service Yard

6.1 Site Planning 1.10

6.1.13. Review Stands at Parade Grounds LT

The location and design of Reviewing Stands should respect the fact that these facilities will generate a great deal of public exposure. Siting should not block existing views toward or from buildings and formal open spaces. (See FL. 6-51)



FL. 6-51 Conceptual Plan

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.1 Site Planning 1.11

6.1.14. Family Housing Development FH

Cluster attached units around common parking courtyards.

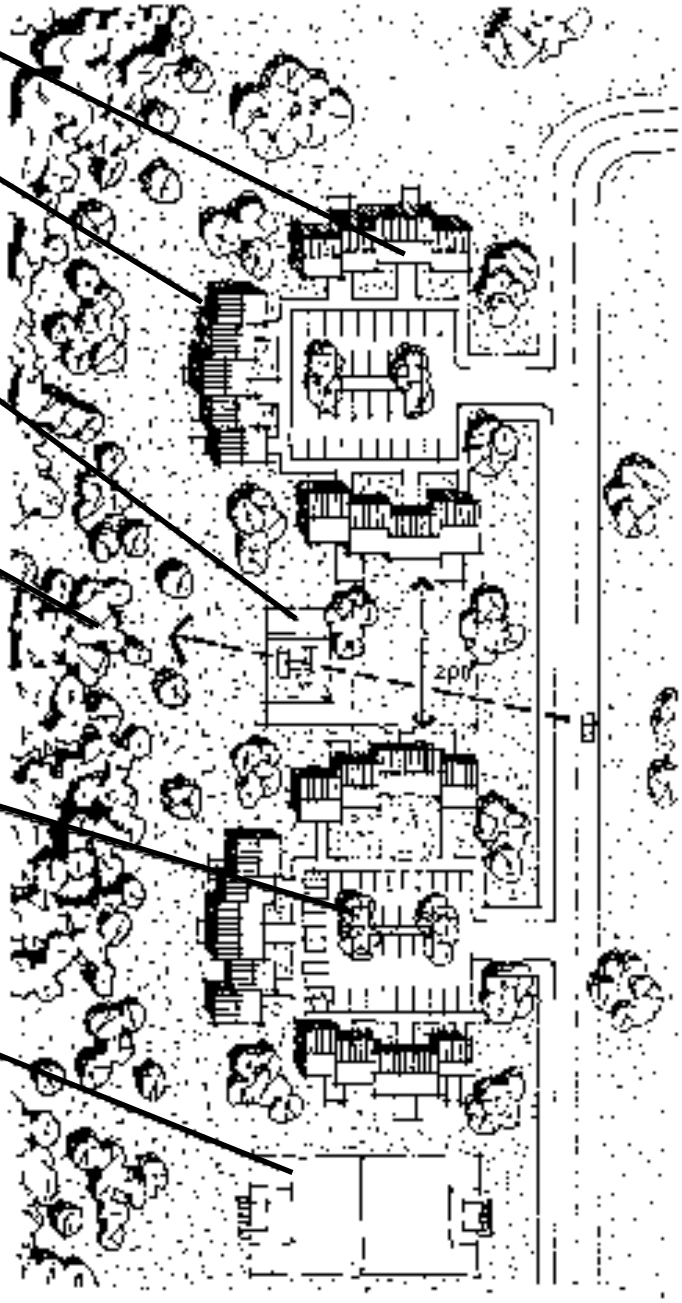
Modulate row to create residential scale and allow for individual identity for each unit. Step back or step forward each pair of units 4 to 8 feet at each step.

Provide open recreation space between housing clusters allowing view to forested areas and breaking up density of development.

New housing development should take full advantage of mature forested areas. Siting should maximize this natural amenity.

Parking court should be planned with trees and planting island to break up excessive paving in center.

Recreational facilities should be developed close to housing and be utilized by several age groups.



FL. 6-52
Conceptual Plan

6.1.15. Drainage in Lawn Areas

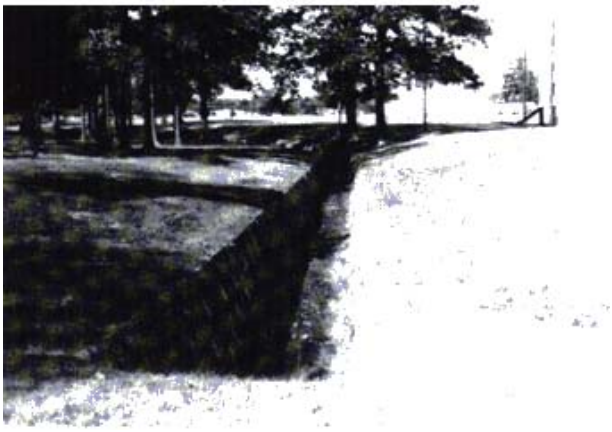
GW LT CC SS TF FH OS

(Page 1 of 2)

Drainage in Lawn Areas. (See FL. 6-52)

6.1.15.1. Existing Ditches

Ditches should be eliminated wherever possible by the use of culverts and underground piping. An overall drainage plan as an engineering study should be conducted by the DEH for underground piping. (See FL. 6-53)



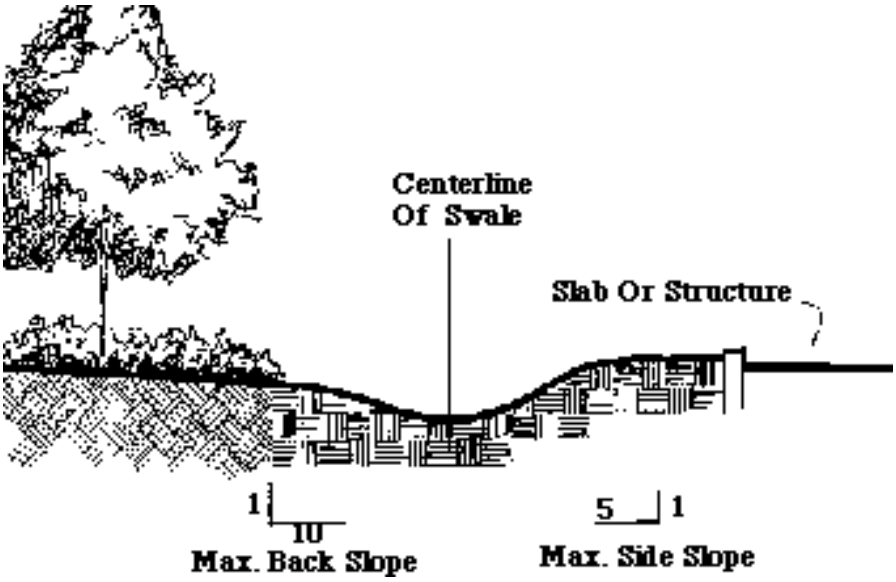
FL. 6-53

Where feasible, drainage ditches should be piped under ground.

6.1.15.2. Swales

Where drainage is minimal and water flow does not require underground piping, grass-covered swales are an appropriate solution. Wide shallow ditches transferring water to a catch basin or lawn inlet should create as little interruption in lawn areas as possible.

Swale location and design will be determined by drainage requirements and surrounding site layout. Round off grade transitions to prevent vegetation and soil erosion. (See FL. 6-54)



FL. 6-54

6.1.15. Drainage in Lawn Areas

GW LT CC SS TF FH OS

(Page 2 of 2)

Field Stone may be required in areas adjacent to drainage structures, such as lawn inlets, to further prevent soil erosion. If excessive riprap is required and the depth of the swale creates a drainage ditch, underground piping and drainage should then be considered by an engineering study. (See FL. 6-55)

The following criteria apply to swale design:

Longitudinal Slope	-	2% min.
Grass	-	8% max.
Riprap	-	10% max.

Cross slope	-	2% min.
Side	-	1:5 max.
Back	-	1:10 max.

Swales should be wide and shallow at the top and should increase in depth at their bottom or low point.

Tree and shrub vegetation should be kept out of grass swales.

FL. 6-55

Drainage Ditches often impede troop circulation on post.

6.2 Design Criteria Section 2 Architecture

Design Criteria Section

2 Architecture

6.2 Architecture 2.0

6.2.1.General Notes

GW LT CC SS TF FH OS

Historical Context

The pattern of development of Fort Lee is a result of a series of building campaigns beginning in 1917. The national emergencies of World War I and World War II each required massive buildups, which took the form of extensive grids of one- and two-story wooden structures.

Nearly all of these structures are now demolished as areas have been redeveloped with more permanent larger structures. However, the basic infrastructure, the pattern of roads and general layout of the post, remains somewhat a permanent legacy of the first building campaign. The distinctive crescent-shaped layout to the main cantonment is largely a result of the railroad and roadway alignments dating to pre-Civil War.

Fort Lee is representative of the over-all trend in redevelopment for military installations, which has been towards fewer and larger more permanent buildings, and away from repetitious grids of temporary structures. This is due in part to efficiencies required by the pragmatic demands of the building functions, as well as the economies of mechanical building systems and energy conservation.

In recent years, a great deal of effort has been directed towards demolishing the WW II era wooden buildings, which has created larger development sites and has set the stage for the current phase of the post's development.

At Fort Lee the result of this redevelopment will be cohesive areas of clearly organized complexes of buildings with well-defined spaces between. This allows for a strong **architectural theme** to be recognized and enforced for these new buildings.

The theme is to be adopted to each visual zone of the post, taking into consideration the existing development. Where brick is the predominant material, it shall continue to be used. Where the buildings have been recently refaced with stucco, that will continue to be used in combination with brick to insure a unified image. And where buildings have been designed with a more formal character, such as at the Post Headquarters, future development must complement and reinforce this formality.

Architectural Themes

Over the past two decades, the more permanent buildings developed at Fort Lee have begun to establish these architectural themes. The use of **red brick with limestone/cast stone trim** for the Headquarters building and several other structures nearby has set a strong precedent for future development in that area. Renovation of the barracks with an exterior wall insulation system has resulted in a consistent tan stucco with brown trim theme for these clusters of buildings.

In the near future, the warehouse district will be redeveloped as the WW II era storage facilities are replaced with new structures. This is an opportunity to significantly improve the public image of the Route 36 corridor through the coordination of building locations and design character.

Several large complexes of new buildings are planned for the area between Adams and Carver Avenues.

6.2 Architecture 2.0

6.2.1. General Notes

GW LT CC SS TF FH OS
(Page 2 of 3)

A cluster of training buildings (from 16th to 19th Streets), a complex of barracks buildings (from 6th to 11th Streets) and a cluster of reserve training barracks and training buildings (from 3rd to 5th Streets).

Each of these areas must be coordinated through the application of the design criteria to insure a strong, unified image.

Moreover, an overall site development plan should be prepared so that the specific building configuration, site design and circulation patterns are entirely designed. This assures design coordination throughout multi-phased development.

Scale and Massing

Where the scale of different buildings has been consistent in a single area, the effect has been a strong unified image. This consistent scale should be continued in new development. Although floor areas and overall bulk of buildings must vary to accommodate required functions, awkward differences in scale must be resolved by carefully shaping the building's mass and by articulating the facade design. DC 2.1 through DC 2.1.4 address these issues.

Design Character

In areas of existing development, the design guidelines for new buildings are based upon the prevailing architectural features common to most of the existing structures. The intended result is the continuation of a unified theme in building materials, detailing, fenestration, roof profiles and general character.

Recently, a major decision has been made to extensively utilize an exterior insulation wall finish system which results in a stucco appearance (similar to Dryvit). This has been used on both renovation work as well as new construction. The design criteria allow for the use of this material in certain visual zones, although a more permanent material is recommended.

Historic Buildings

Fort Lee has very few historic structures. However, as repairs, renovations or alterations are required for these buildings, follow the recommendations of *The Secretary of the Interior's Standards for Rehabilitation of Historic Buildings.*

Materials and Colors

To maintain a coordinated "palate" of building materials and colors within a single area, refer to DC 2.6.0 through DC 2.6.4. Recommendations are outlined for all major building components.

The architectural themes developed for Fort Lee involve a choice between two major building materials, brick or a combination of brick and stucco. A third choice of all stucco may be used in areas less visible by the public. The chart summarizes how these material choices have been assigned to each visual zone. The Architectural Design Character sketches reflect these material choices. Note that the use of all-stucco is limited to the portions of the OS zone that already has stucco buildings.

6.2 Architecture 2.0

6.2.1. General Notes

GW LT CC SS TF FH OS

Technical & Engineering Aspects

Consideration of performance aspects of these building components, such as life cycle costs and value engineering may require refinements to these specific recommendations. In general, the goal is to match the material and color selections for major building components within a single visual zone. Where existing buildings exist, these serve as the basis for matching new buildings.

These Design Criteria are intended for control of the *appearance* of building materials. Responsibility for adequate and appropriate technical performance of building components lies with the project manager, DEH, architect, engineer, builder and/or construction manager.

Summary of Materials

GW / Gateway Zone

Because the Gateway Zone is restricted to the public highway corridors, it is presumed that no buildings need be built within this area. However, if the need arises, *brick* should be used as the major building material.

LT / Living-Training Zone

This is a large area within which are several different established themes which must be continued. *Brick and cast stone* is to be used in the Head quarters vicinity, *Brick and Stucco* is to be used for new development from 1st Street through 11th Street, and in all other areas.

CC / Community Center Zone

Use all *brick* in this highly visible zone.

SS / Service & Storage Zone

Use a combination of *brick* base and detailing in combination with vinyl/aluminum metal siding. Where visibility is greatest, utilize best materials.

TF / Tenant/Facilities Zone

Use all *stucco and brick* in the Logistics Center vicinity, all *brick* in the ALMC vicinity, *stucco & brick* in all other areas.

FH / Family Housing Zone

Use matching materials in areas of existing housing, (e.g. brick & vinyl siding where it is presently used).

OS / Open Space Zone

Stucco and *Brick* for all areas within the main cantonment or visible from primary roadways (i.e. within 300 ft.).

Brick wainscotting should be used from the ground up to the first floor window sill height. Corners of the building and piers between major masses of the building should be built of brick, so that the stucco surfaces are seen as infill between brick masses. The Design Character sketches included In this section demonstrate this approach.

Theme	Area of Application
All Brick	* Headquarters vicinity * Hospital vicinity * Commissary vicinity * Post Exchange Vicinity * Within 400 ft. of Lee Ave. * All Gatehouses * Family Housing Area “A” * ALMC area * Petroleum School vicinity
Brick & Stucco	* All other areas of the post except Family Housing
Brick & Siding	* Family Housing Areas "B" and "C" * Field Training areas

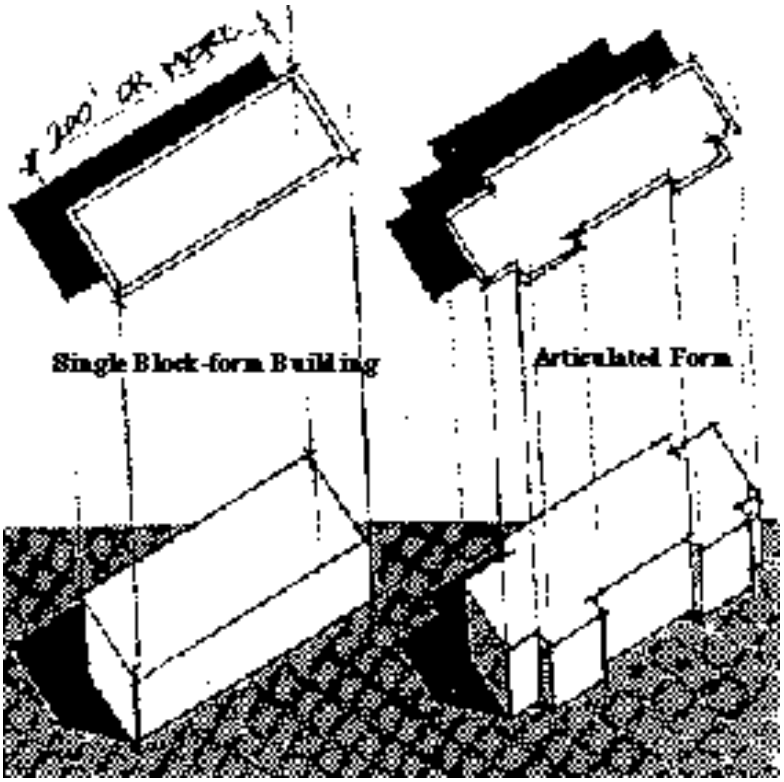
6.2 Architecture 2.1.1

6.2.2. Massing and Articulation GW LT CC SS TF FH OS

Large Buildings

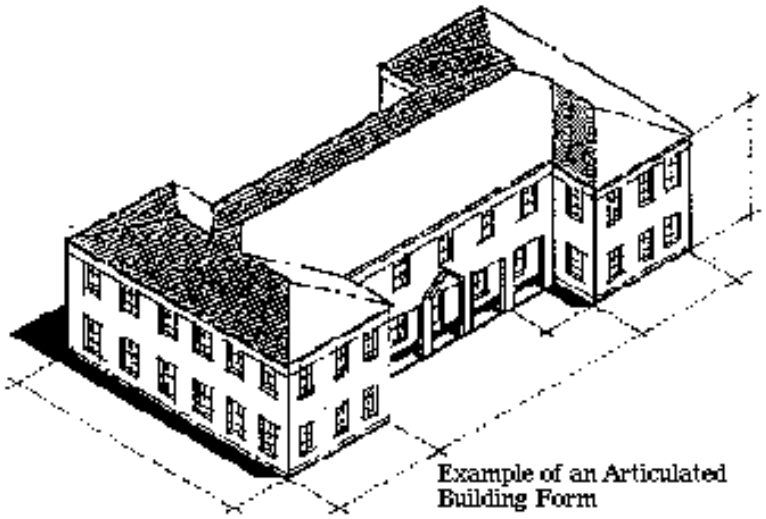
Simple block-forms for larger buildings appear awkward and out-of-scale when located among smaller-scaled structures. (See FL. 6-56)

When the program requires a large building mass, the form must be "articulated" by modulating the facade plane. This breaks up the otherwise massive form and reduces the apparent scale to better fit with the surrounding buildings.



FL. 6-56

This example shows a large building which has been "articulated" to appear as three smaller rectangular forms. A central gallery flanked by two pavilions. (See FL. 6-57)



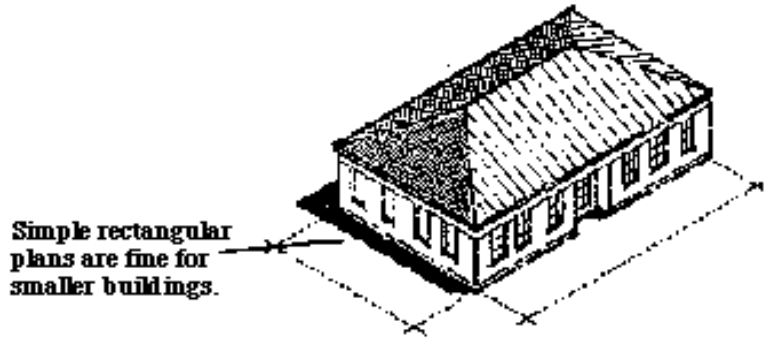
FL. 6-57

6.2 Architecture 2.1.2

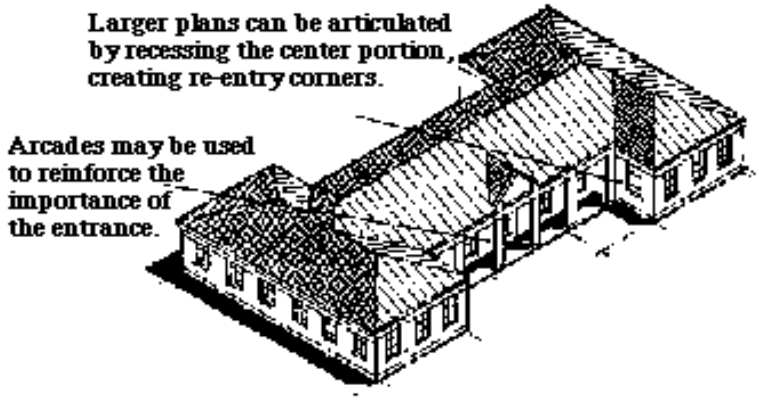
6.2.2. Massing and Articulation GW LT CC SS TF FH OS

Single Story Buildings

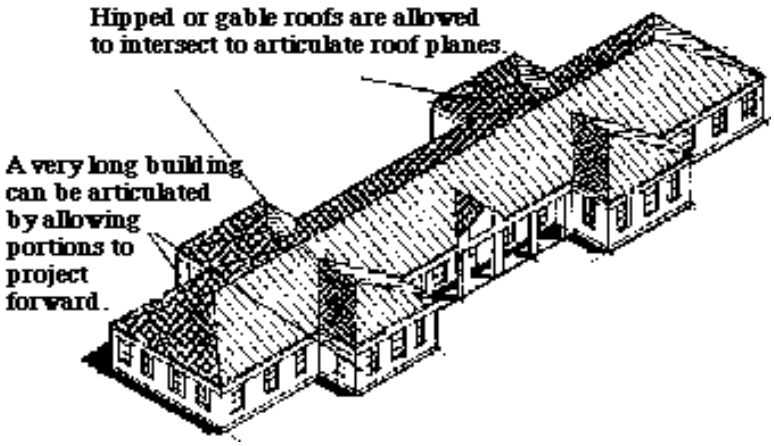
When program requires a large building mass, the form should be "articulated" by modulating the facade plane. (See FL. 6-58,FL. 6-59, and FL. 6-60)



FL. 6-58



FL. 6-59



FL. 6-60

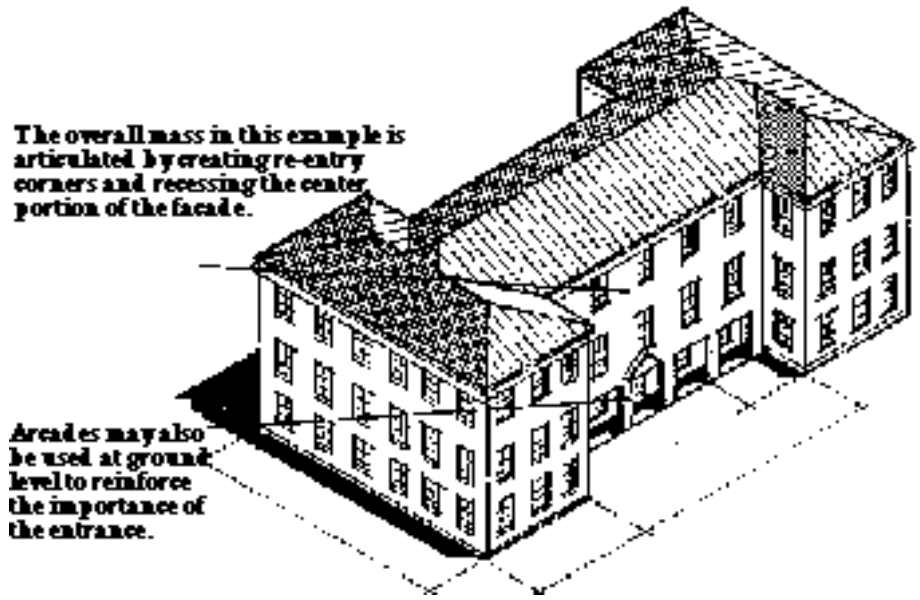
☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.2 Architecture 2.1.3

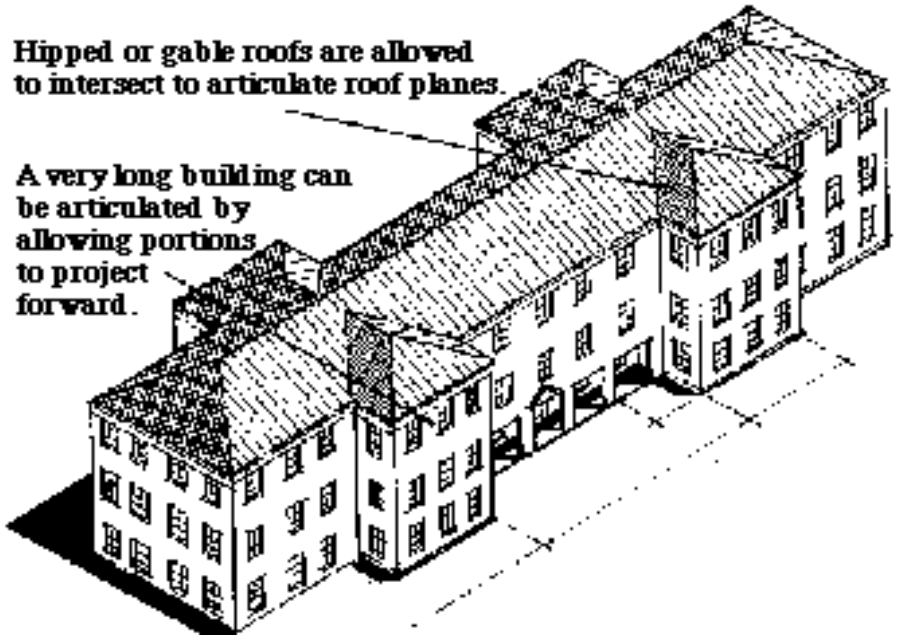
6.2.2. Massing and Articulation GW LT CC SS TF FH OS

2 & 3 Story Buildings

When program requires a large building mass, the form should be "articulated" by modulating the facade plane. (See FL. 6-61 and FL. 6-62)



FL. 6-61



FL. 6-62

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

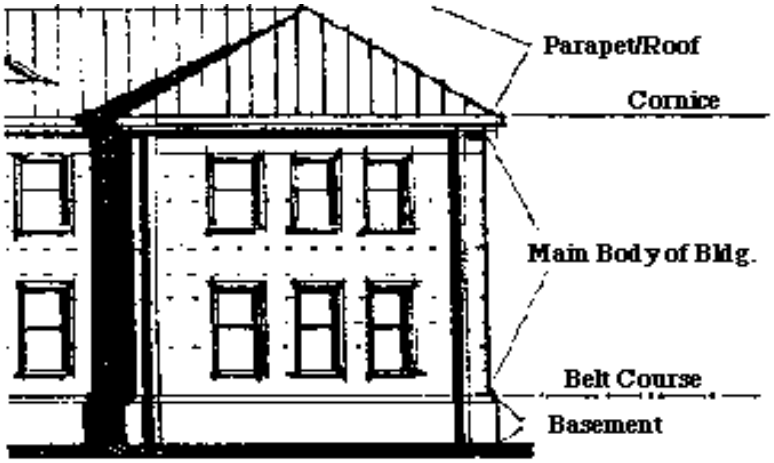
6.2 Architecture 2.1.4

6.2.2. Massing and Articulation GW LT CC SS TF FH OS

Building Height

Overall scale and massing of buildings must be coordinated to insure a unified image for the installation. In any single area, the heights of buildings should be matched, so that a consistent scale is maintained. Differences in floor-to-floor heights and sloping sites may require some variation. However, in general, alignment of all major building features is preferred. These include general fenestration, cornice lines, belt courses and roof lines, all of which should be aligned with adjacent buildings whenever possible. (See FL. 6-63)

Although specific program requirements may require higher or lower structures, wherever feasible, the following Recommended Maximum Building Heights are to be applied. Where indicated, the Preferred Building Height represents an ideal height for all buildings in the visual zone. (See FL. 6-64)



Elevation Elements

FL. 6-63

Recommended Maximum Building Heights							
	GW	LT	CC	SS	TF	FH	OS
1 Story	●						○
2 Stories			○	●		●	●
3 Stories		○	●		○		
4 Stories		●			●		

● = Maximum Allowed ○ = Preferred Bldg. Ht.

FL. 6-64

6.2 Architecture 2.1.5

6.2.2. Massing and Articulation GW LT CC SS TF FH OS

Taller Buildings

Tall massive buildings, when placed among much smaller buildings, may appear awkward and out-of-place.

When the program requires a taller building in an area of smaller structures, the design of the taller building must be "articulated" to reflect the predominant scale of the surrounding area.

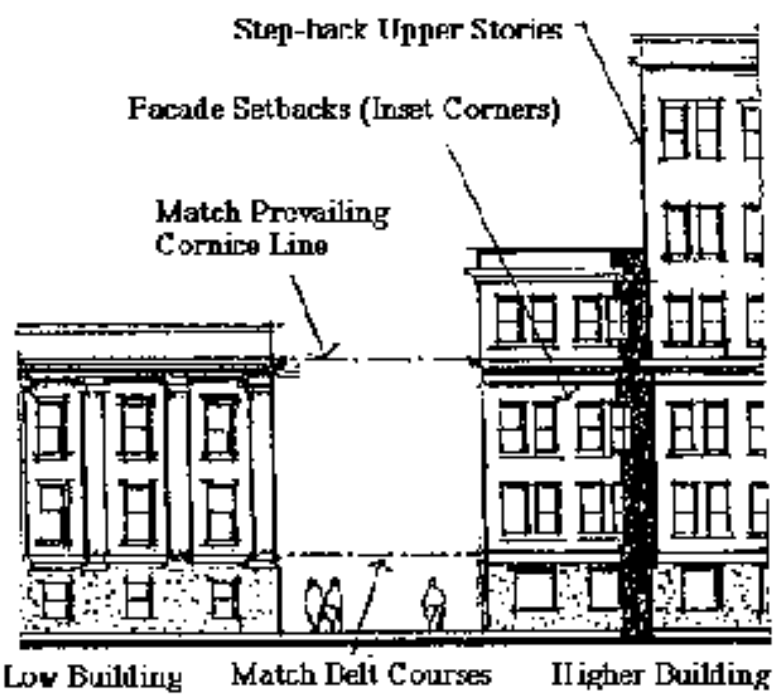
The following design techniques are to be used where appropriate:

* Match cornice line height where adjacent buildings have prominent cornice features.

* Match belt courses or other important lines of vertical articulations.

* Modulate facade plane to reduce overall scale of building mass.

* Step-back upper stories above prevailing cornice line. (See FL. 6-65)



FL. 6-65

6.2 Architecture 2.2.1

6.2.3. Design Character LT

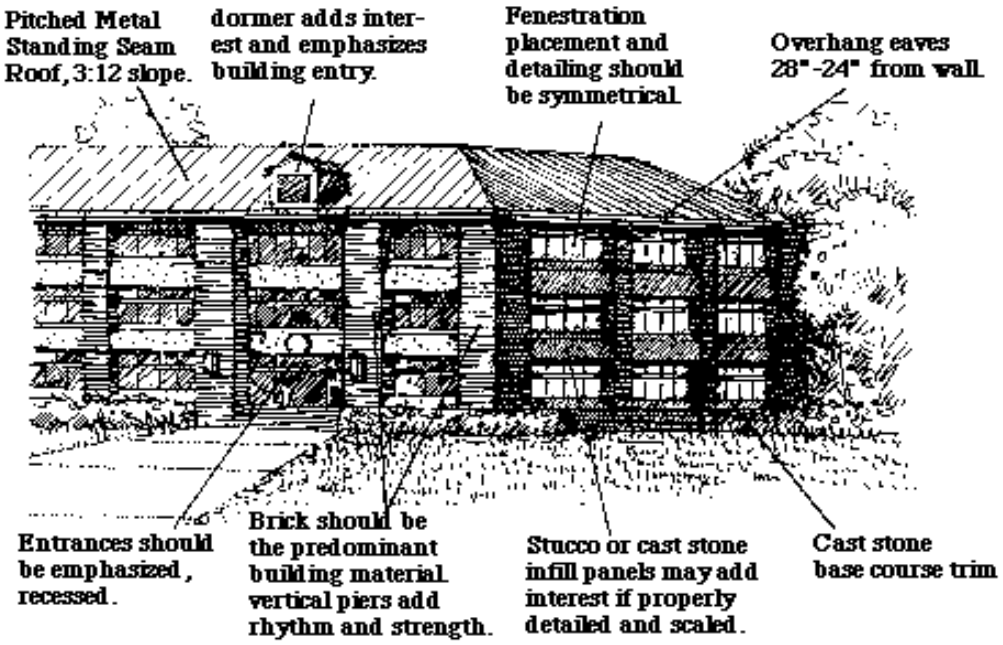
Traditional Brick Theme

General Notes

The design of new buildings should relate in scale and materials to existing significant buildings such as Miflin Hall.
(See FL. 6-66) Brick should be used as the predominant building material. Pitched roofs and properly scaled window openings should also contribute to a formal, monumental building form. Buildings in the LT Zone from 19th to 27th Streets should especially reflect this theme. This theme is appropriate for administrative, laboratory, classroom and research buildings which are multi-storied and have large floor areas. (See FL. 6-67)

FL. 6-66

Mifflin Hall establishes a design vocabulary for new buildings.



FL. 6-67 Design Concept for New Buildings

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

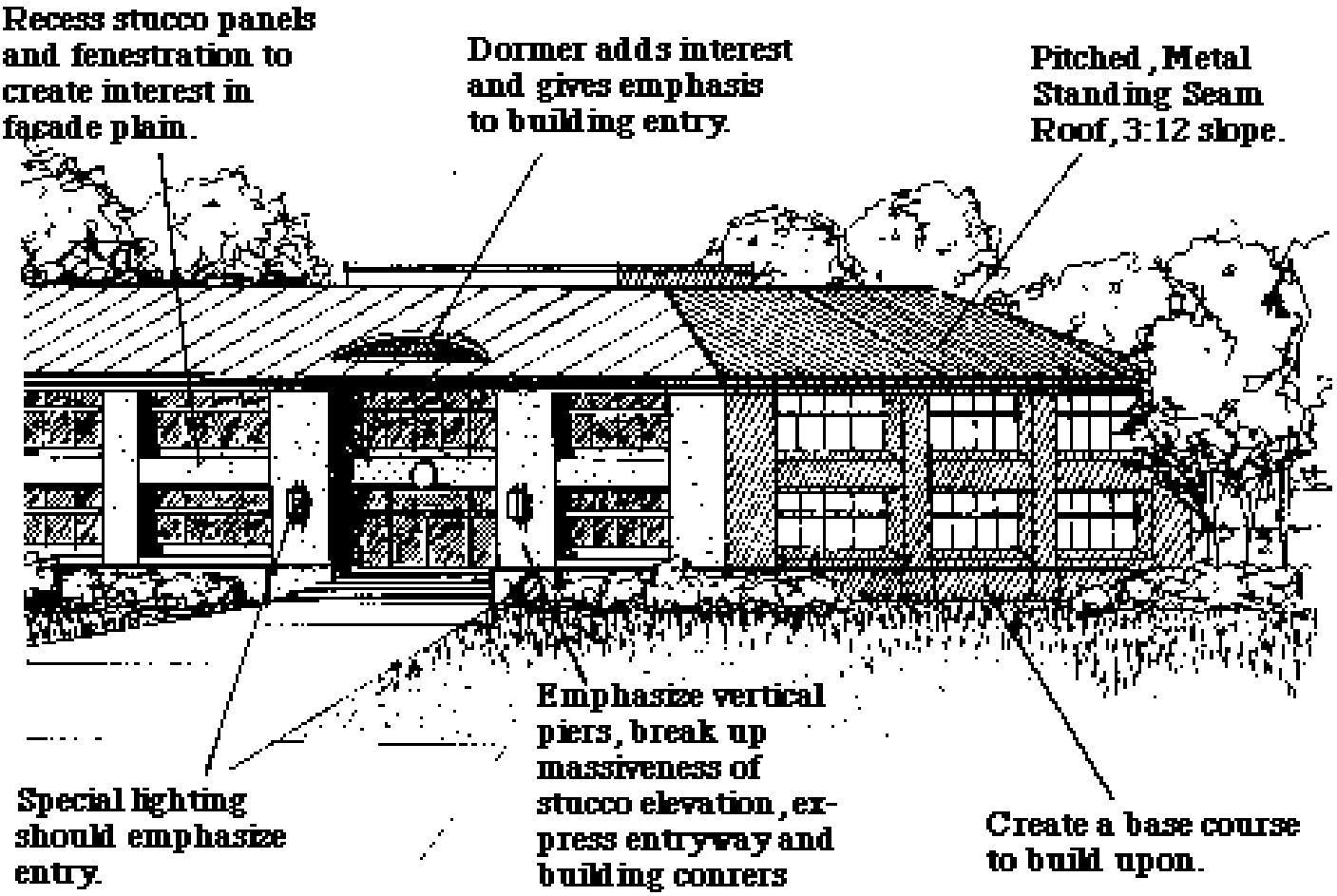
6.2 Architecture 2.2.2

6.2.3. Design Character TF

Traditional Theme, Non-Brick

General Notes

The design of new buildings should relate in scale and materials to existing significant buildings. While masonry is preferred, stucco may be introduced in this zone. Pitched roof forms and properly scaled windows will contribute to the positive design theme. (See FL. 6-68)



FL. 6-68 Design Concept for New Buildings

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.2 Architecture 2.2.3

6.2.3. Design Character CC

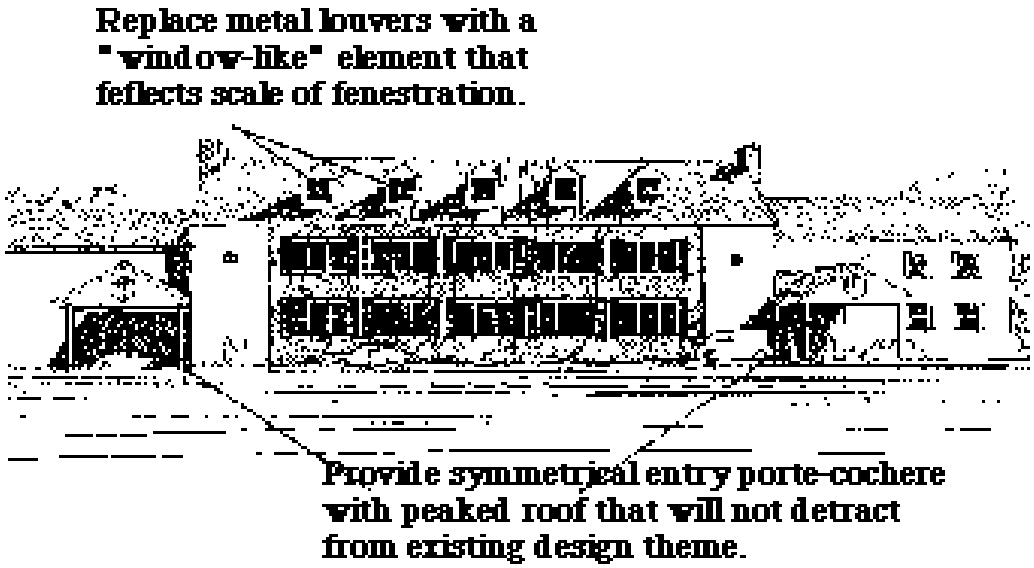
Officers' Club Elevation

General Notes

The Officers' Club represents a symmetrical, formal visual terminus to Lee Avenue. (See FL. 6-69) The form of the building should be respected with the introduction of new elements such as porte-cochere symmetrically placed at the entry. (See FL. 6-70)

FL. 6-69

The regular spacing of window openings creates a suitably dignified image for the Officer's Club.



FL. 6-70 Conceptual Elevation

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

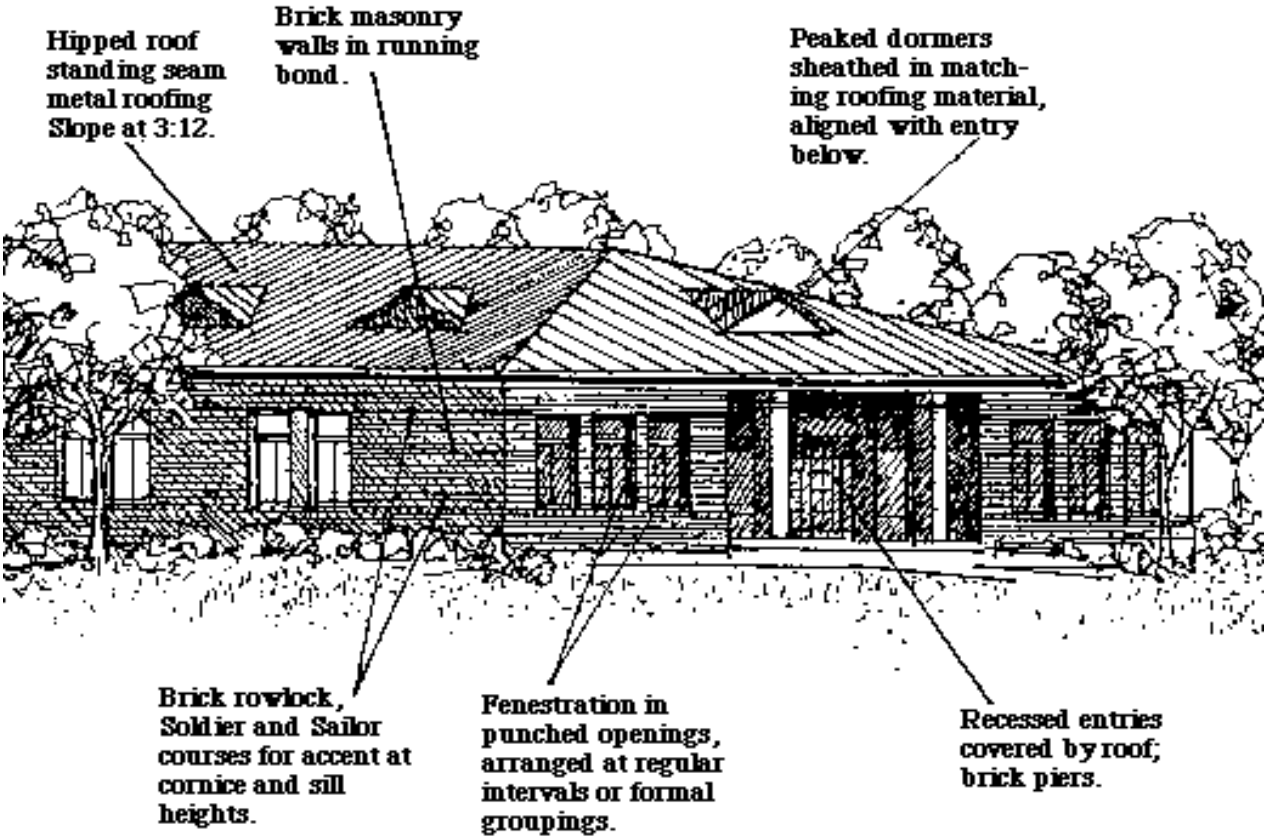
6.2 Architecture 2.2.4

6.2.3. Design Character GW LT CC TF

Contemporary Brick Theme

To be used for all building function types except warehousing throughout the referenced visual zones. This criteria is especially appropriate for classroom, training, administration, and community service buildings. (See FL. 6-71 and FL. 6-72)

FL. 6-71
Sword & Key Enlisted Club represents a new one-story brick building.



FL. 6-72

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.2 Architecture 2.2.5

6.2.3. Design Character LT CC

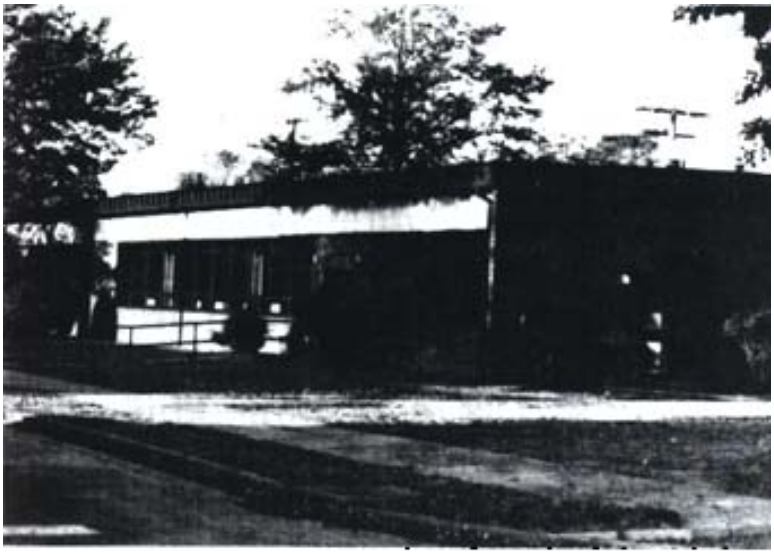
In those areas of the post where brick has been the prevailing material in permanent buildings, new structures should be designed in brick with limestone/cast stone trim. (See FL. 6-73) These areas include:

* Headquarters Bldg. vicinity (Quartermaster School Bldg.)

* Hospital vicinity

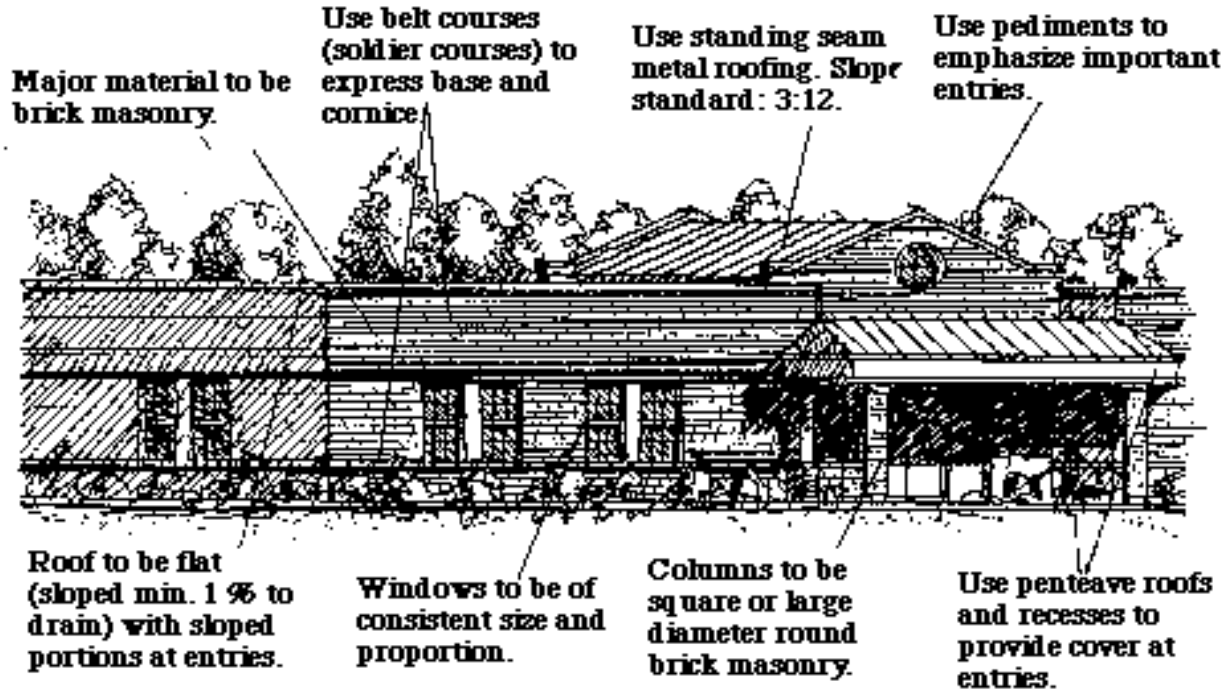
* Post Exchange vicinity

* New Commissary vicinity. (See FL. 6-74)



FL. 6-73

Building #3325 is representative of much of the existing design character.



FL. 6-74

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

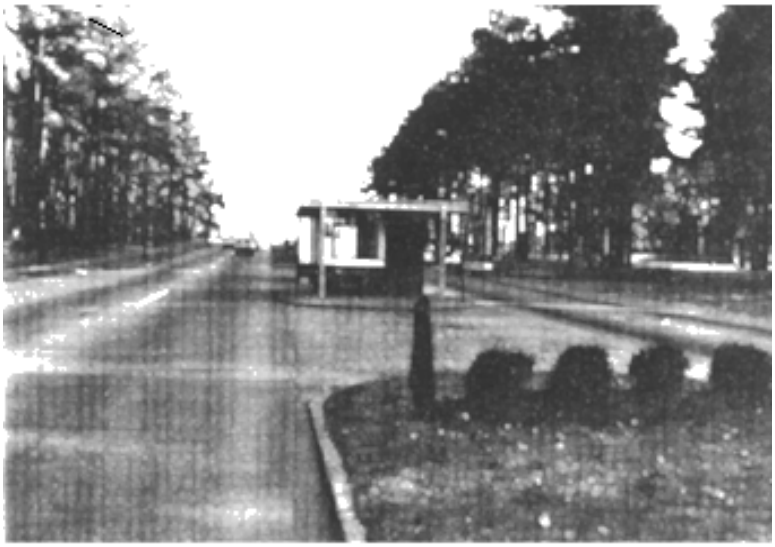
6.2 Architecture 2.2.6

6.2.3. Design Character GW

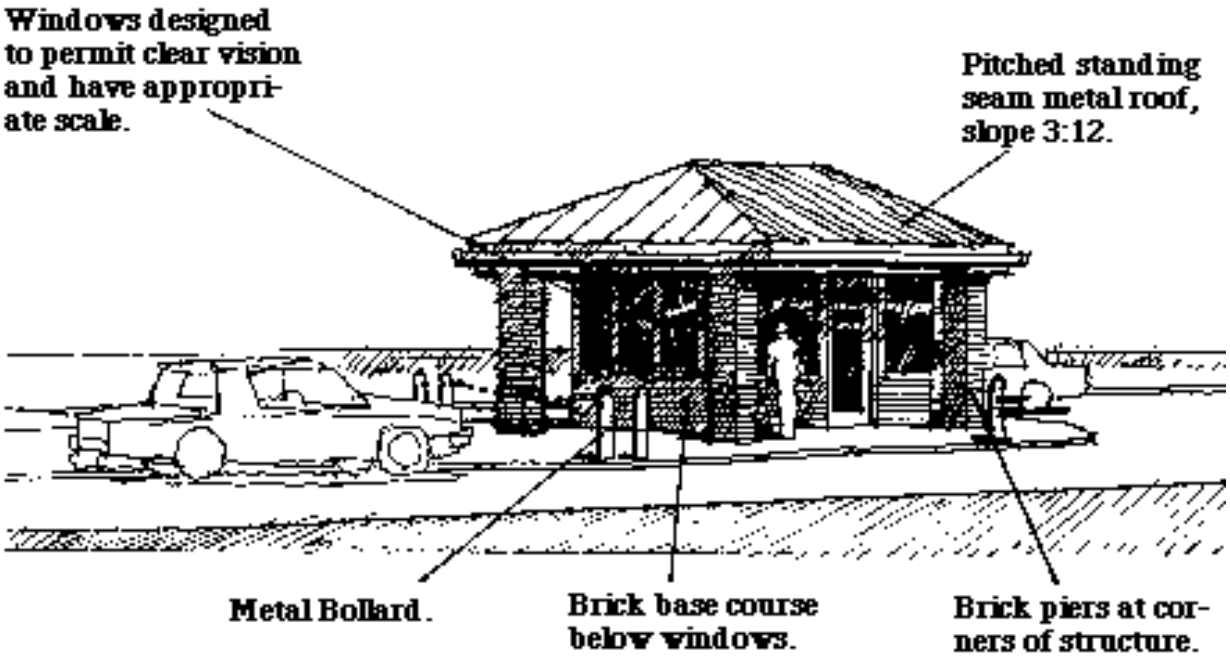
Gatehouse/ Sentry Station

General Notes

The Gatehouse is the first structure one sees when approaching the Post. (See FL. 6-75) The structure should be simple but well designed. Brick and metal sloped roof should be used. Appropriate lighting and site furnishings should be incorporated to improve the visual image. (See FL. 6-76)



FL. 6-75
Existing Gatehouse at Lee Avenue.



FL. 6-76 Design Concept

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

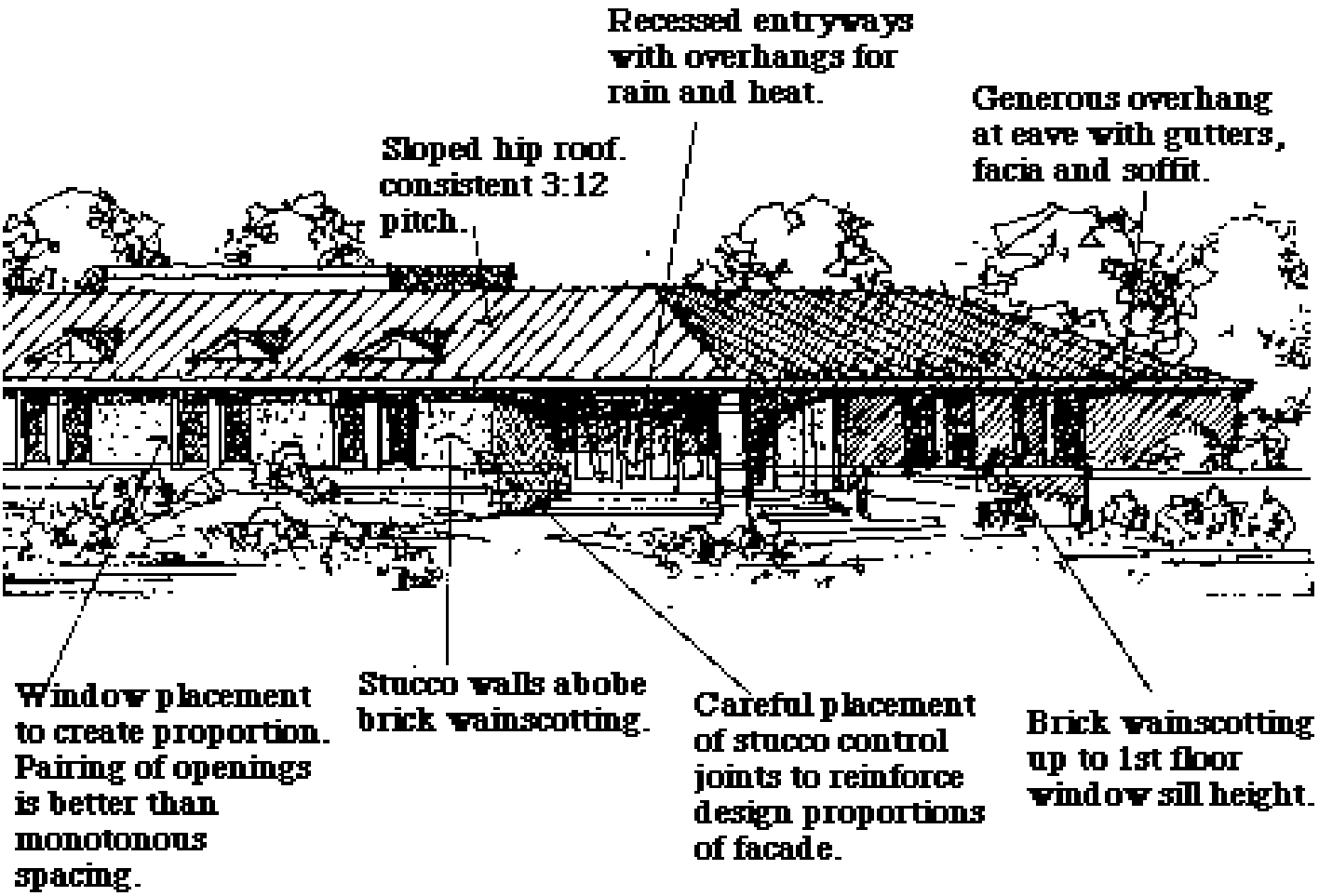
6.2 Architecture 2.2.7

6.2.3. Design Character LT CC SS

Contemporary Stucco & Brick Theme

Several new buildings are proposed within the visual zones referenced above. In some cases, several new buildings will be developed in a cohesive cluster in an area where existing structures are to be demolished or no buildings currently exist.

These new projects must be designed according to a single architectural style with matching materials, so that they create a unified image for the area. (See FL. 6-77)



FL. 6-77

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.2 Architecture 2.2.8

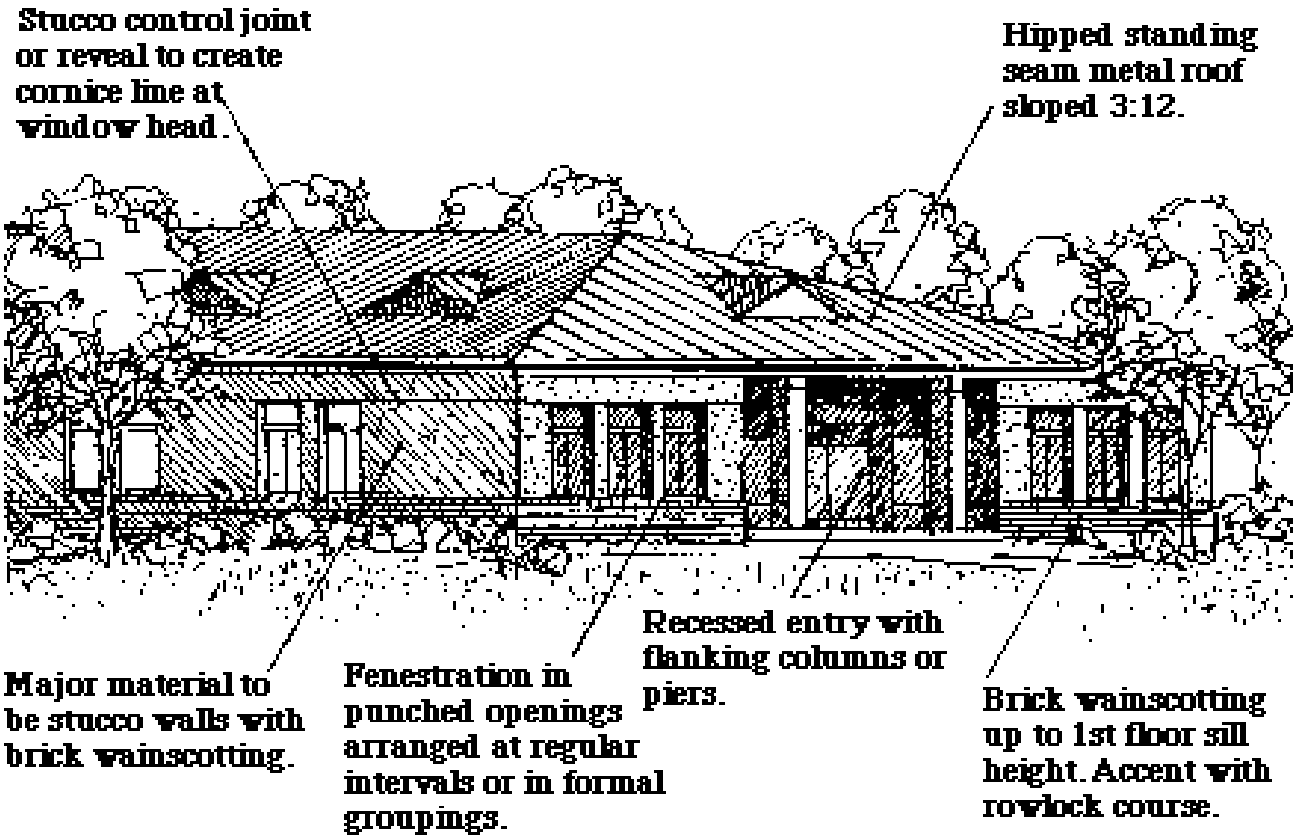
6.2.3. Design Character SS TF OS

Contemporary Stucco & Brick Theme

New buildings proposed for the above referenced visual zones are to be designed according to a single architectural style with matching materials, so that a unified image is created for those areas. (See FL. 6-78)

The example illustrated below is particularly appropriate for administrative, training, dining, and other community support functions. (See FL. 6-79), (See FL. 6-80)

FL. 6-78
Existing design character can be improved.



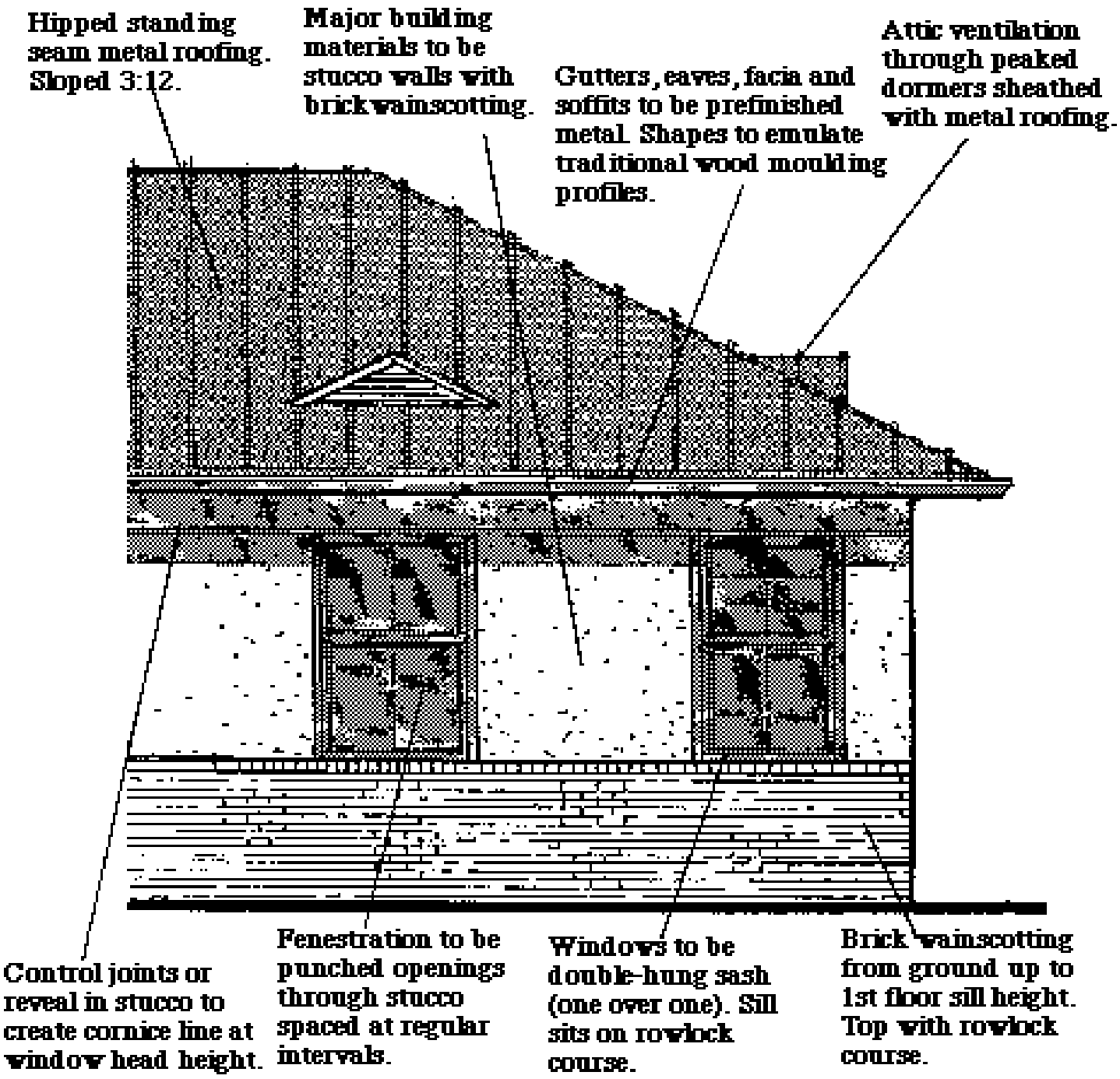
FL. 6-79

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.2 Architecture 2.2.9

6.2.3. Design Character SS TF OS

Contemporary Stucco & Brick Theme



FL. 6-80

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

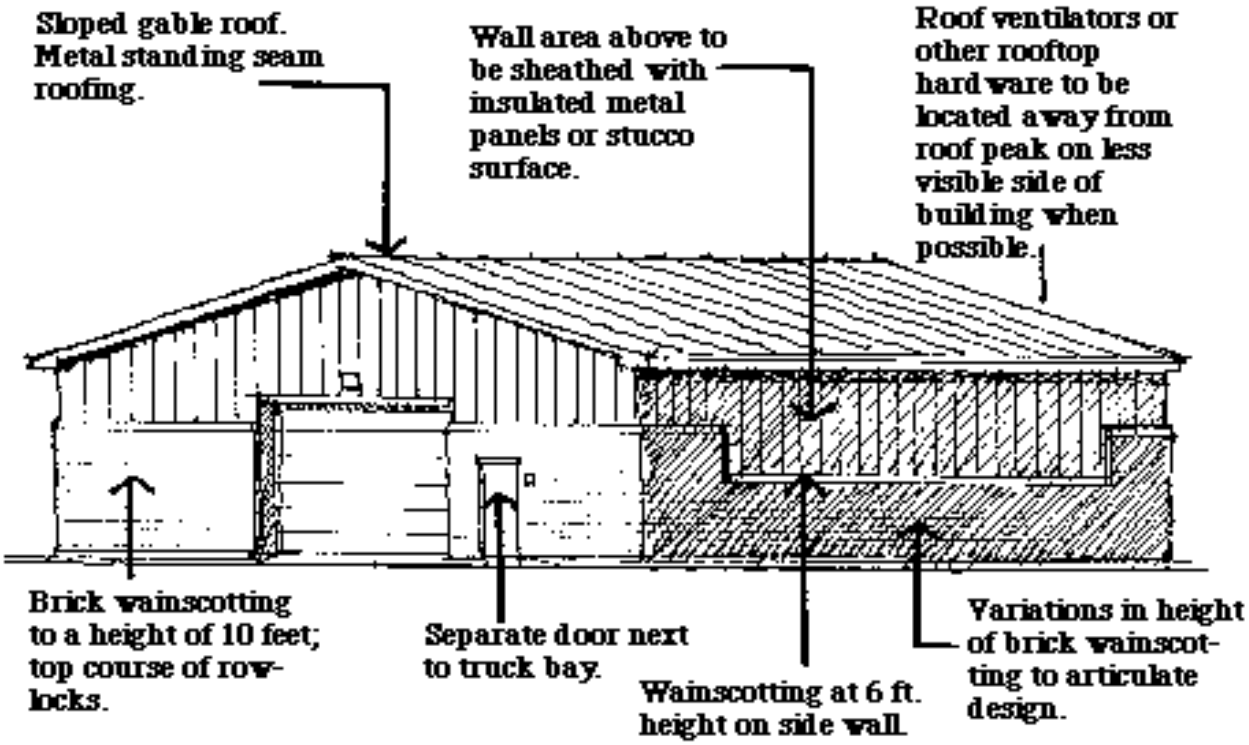
6.2 Architecture 2.2.10

6.2.3. Design Character SS

Storage Buildings

It is important that the proposed new warehouse structures continue this tradition with brick chosen to match the existing buildings. (See FL. 6-81) For more specific materials and color guidelines see DC 2.6. (See FL. 6-82)

FL. 6-81
Wharehouses along Route 36.



FL. 6-82

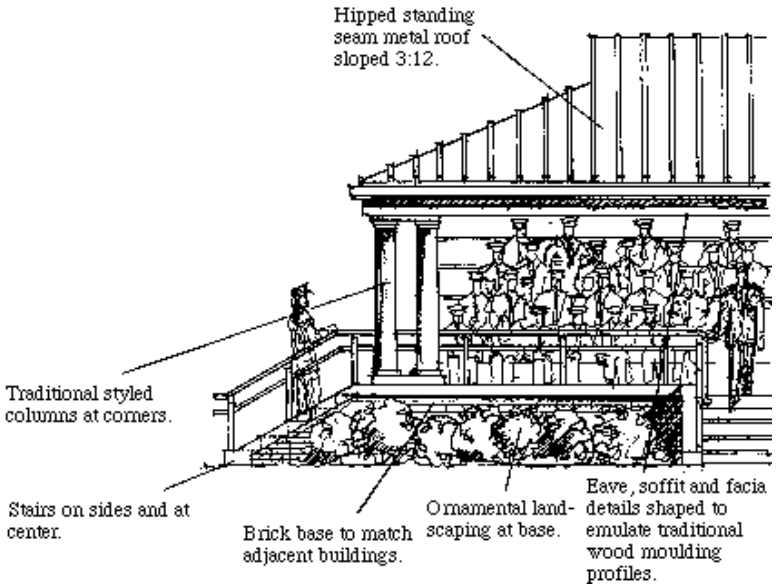
6.2 Architecture 2.2.11

6.2.3. Design Character LT

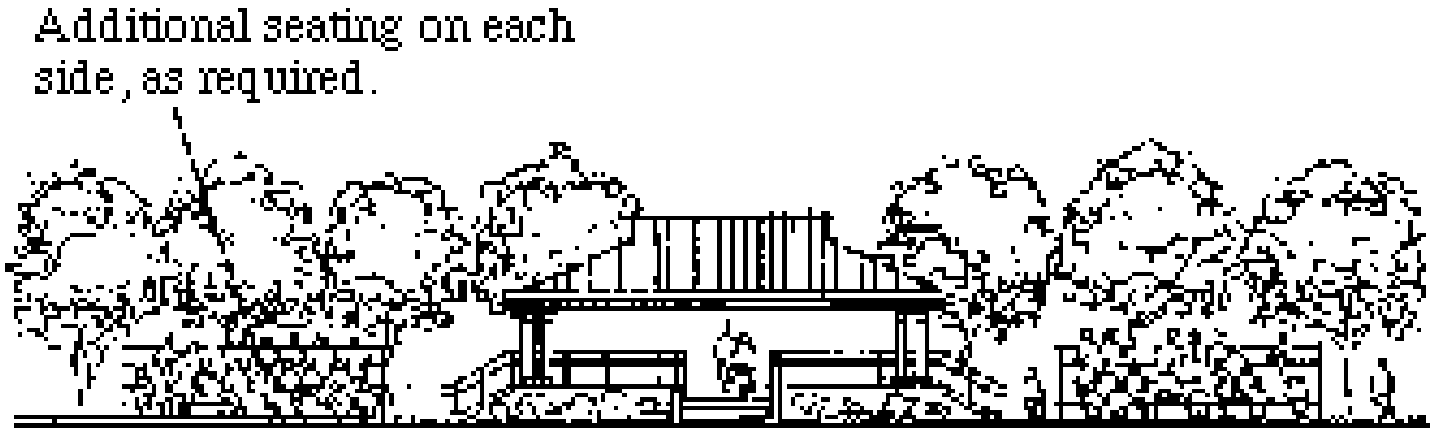
Reviewing Stands at Parade Grounds

Parade Ground and VIP reviewing stands are among the most highly visible aspects of the post from the point of view of the important visitor and senior command. As such, the design of these facilities represents the quality of the installation as a whole, and therefore deserves careful attention. (See FL. 6-83)

The review stand should not be seen as a temporary structure. It is an important permanent building marking the central axis of a formal ceremonial place. (See FL. 6-84)



FL. 6-83



FL. 6-84 Conceptual Elevation

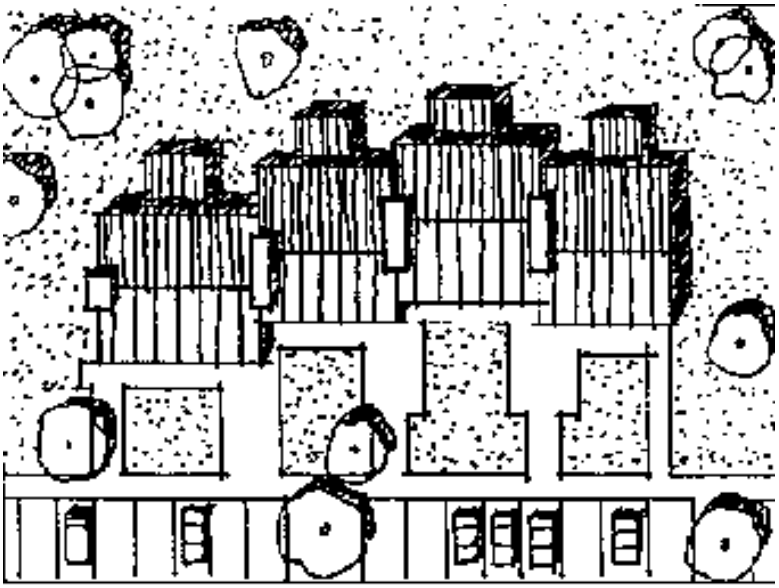
☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.2 Architecture 2.2.12

6.2.3. Design Character FH

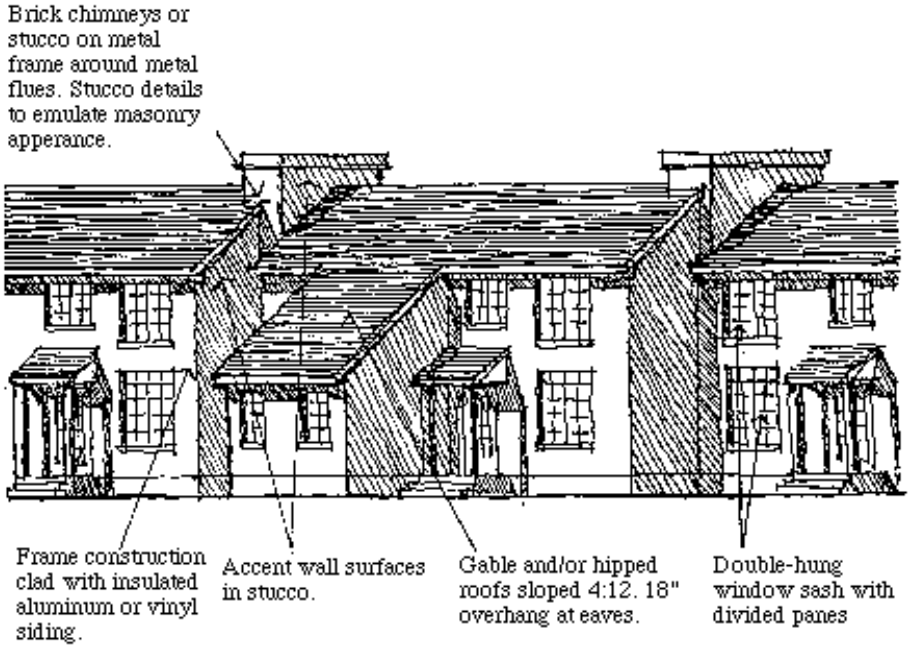
New Family Housing

Any new family housing which may be developed in the future is to follow these design guidelines. Emphasis is given to stepping the plan to give greater individual identity to each dwelling unit. Brick masonry is recommended, though vinyl siding or stucco surfaces may also be used in coordination with brick. (See FL. 6-85), (See FL. 6-86)



FL. 6-85

Conceptual plan of "stepped" family housing units (row of 8 units).



FL. 6-86

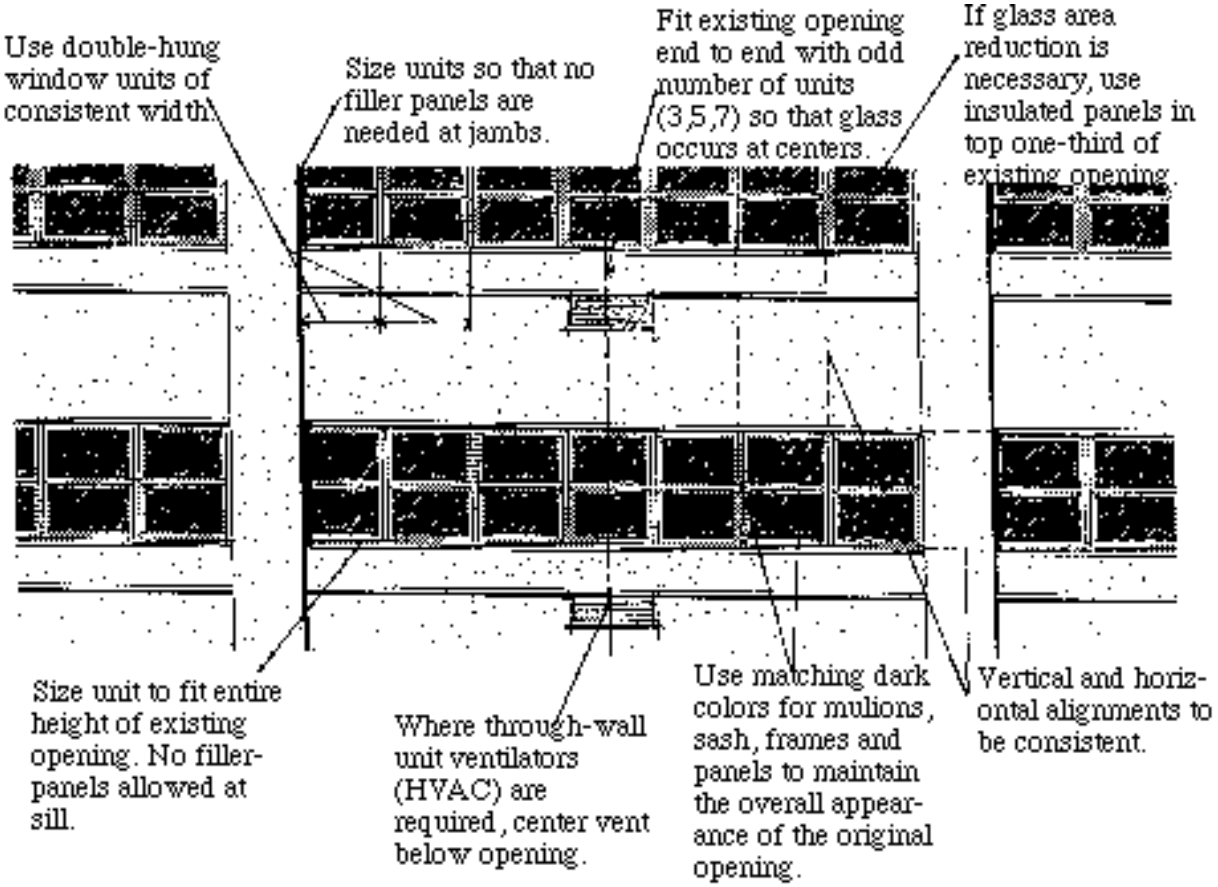
6.2 Architecture 2.3.1

6.2.4. Fenestration LT

Replacement Horizontal Strip Windows

The overall appearance of horizontal strip windows is to be maintained where this style of fenestration already exists and windows require replacement. This can be accomplished by selecting matching dark colors for all non-transparent surfaces within the original opening, including mullions, sash, insulated panels, and Bashing. (See FL. 6-87) from a distance, the overall opening will "read" rather than the individual window unit, and the pattern and proportions of the original building fenestration will be maintained. See DC 2.6 for color and material guidelines. (See FL. 6-88)

FL. 6-87
Existing Barracks in the LT Visual Zone.



FL. 6-88

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

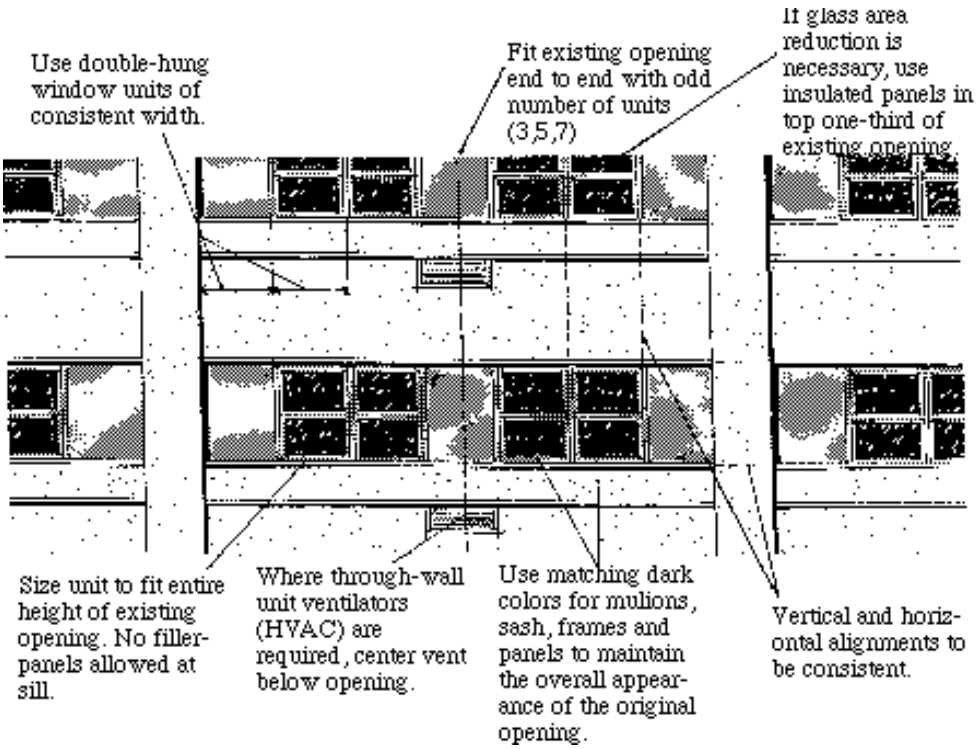
6.2 Architecture 2.3.2

6.2.4. Fenestration LT

Fenestration- Replacement Horizontal Strip Windows

The overall appearance of horizontal strip windows IS to be maintained where this style of fenestration already exists and windows require replacement. (See FL. 6-89) This can be accomplished by selecting matching dark colors for all non-transparent surfaces within the original opening, including mullions, sash, insulated panels, and flashing. from a distance, the overall opening will "read" rather than the individual window unit, and the pattern and proportions of the original building fenestration will be maintained. See DC 2.6 for color and material guidelines. (See FL. 6-90)

FL. 6-89
Existing Barracks.



FL. 6-90

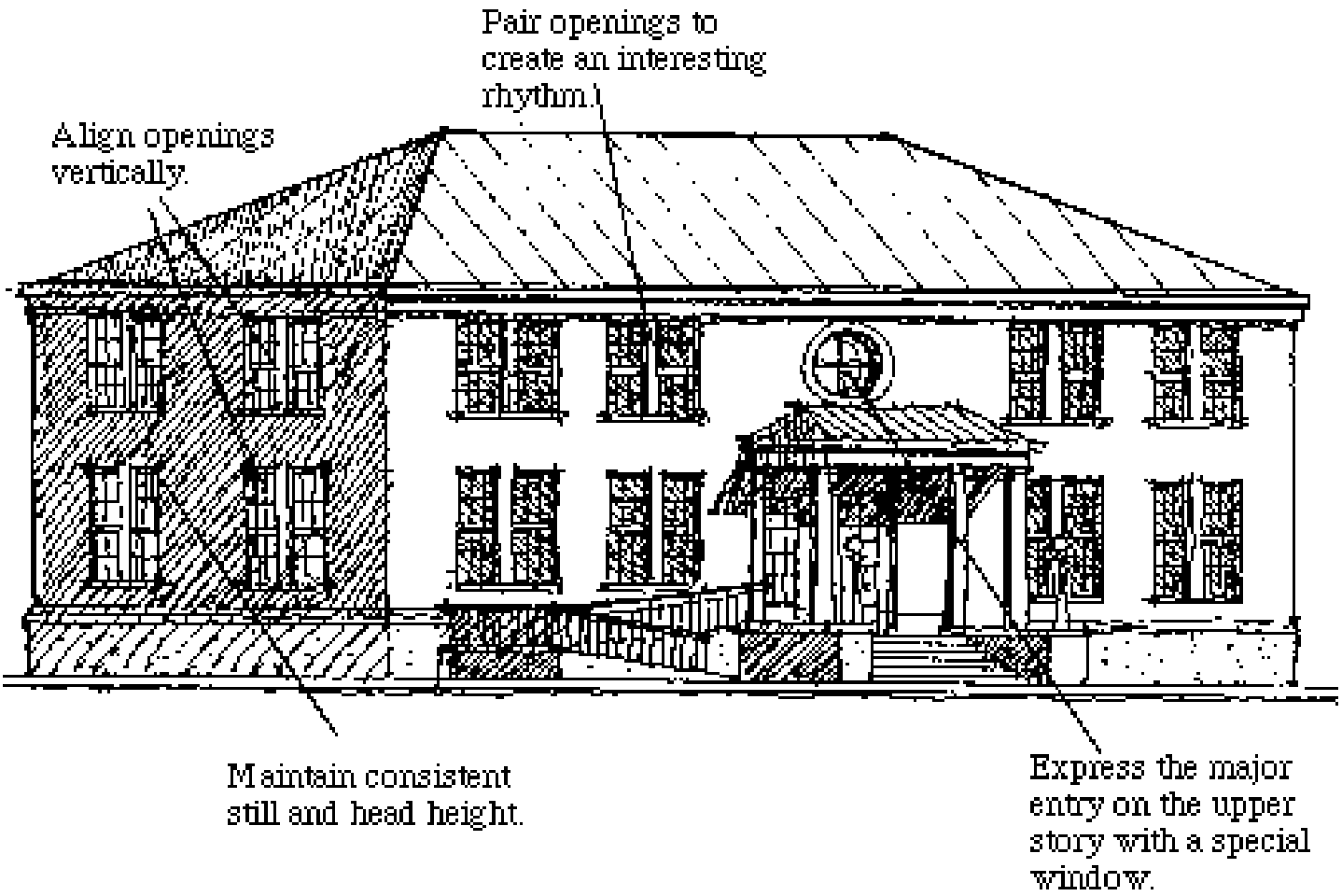
6.2 Architecture 2.3.3

6.2.4. Fenestration GW LT CC TF

Placement of Windows

The rhythm, pattern and proportions of window openings are major factors in a building's design character.

Careful placement of windows is to be considered to reinforce the building's formality, particularly where the building is prominently located. (See FL. 6-91)



FL. 6-91

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

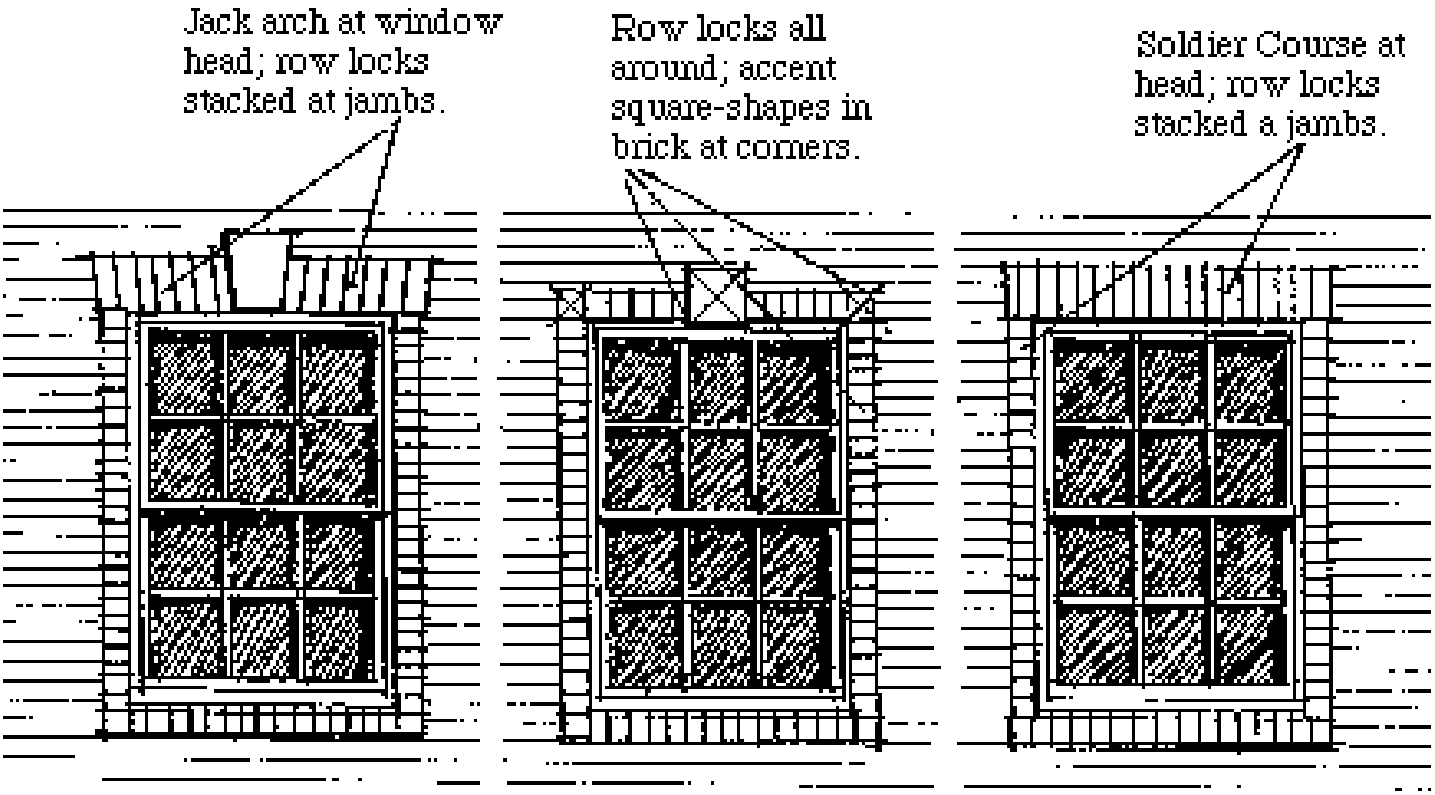
6.2 Architecture 2.3.4

6.2.4. Fenestration GW LT CC SS TF

Detailing of Openings

Brick buildings with carefully detailed openings have become the tradition in many areas of the post. New construction in these areas is to continue this design theme by the use of brick as a major building material, and the use of appropriately-detailed window and doorway openings.

Following are several examples of sill, head and jamb brick detailing. Where possible, match the style of openings used in existing adjacent buildings. Where no precedent exists, choose one of these examples. (See FL. 6-92)



FL. 6-92

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

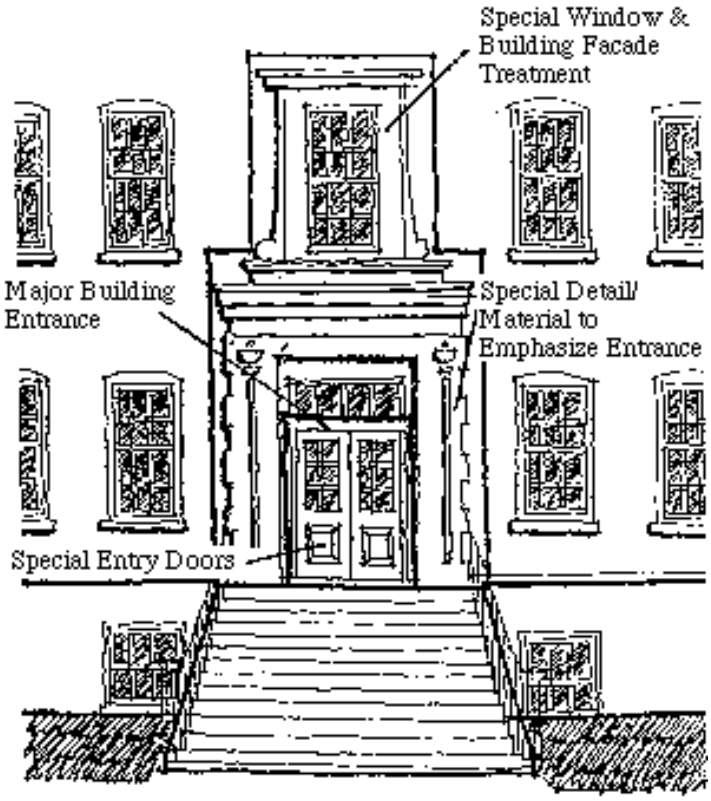
6.2 Architecture 2.4.1

6.2.5. Entrances GW LT TF

Important Building Entrances
Vertical Articulation

To emphasize important entrances, special window(s) immediately above the entry doorway may be introduced. Special detailing and the introduction of cast stone/limestone will add to the expression of the entrance. (See FL. 6-93)

Brick detailing may be used to extend the architectural expression of the first floor entry up into the second story, surrounding both the doorway and the window above. (See FL. 6-94)



FL. 6-93
Conceptual Illustration of Entry

FL. 6-94
Illustrative Example of Entrance Articulation.

6.2 Architecture 2.4.2

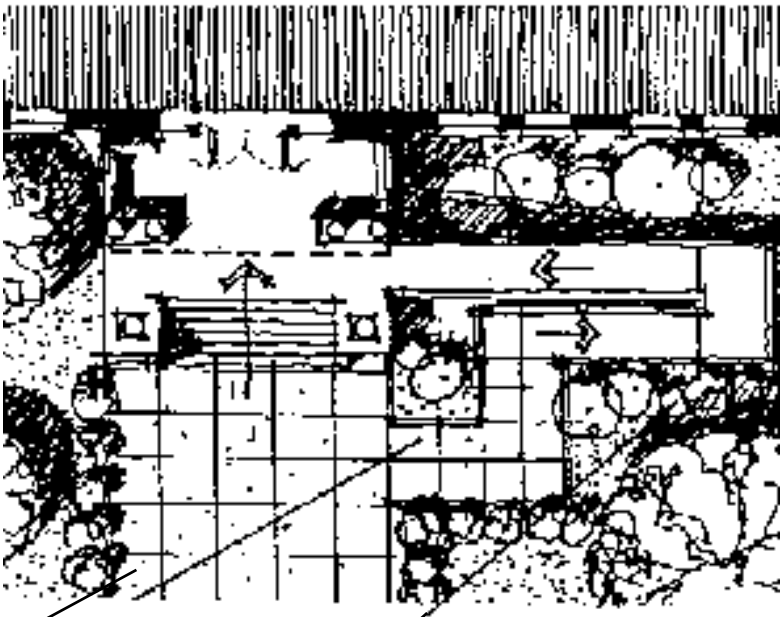
6.2.5. Entrances GW LT CC SS TF FH OS

Ramps at Entrances

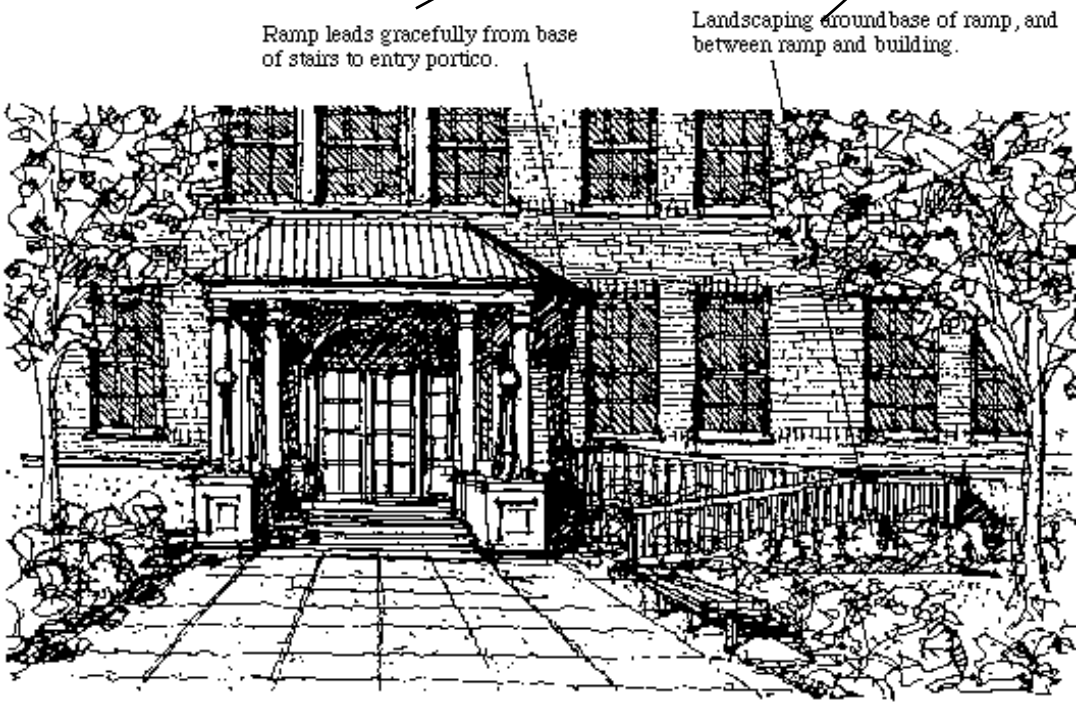
Handicapped access ramps are to be placed to the side to allow for proper ramp distances without interrupting view of formal stairs and doorways. (See FL. 6-95)

Landscaping is to be used to screen the bulk of the ramp base, but allow visibility above railing height. (See FL. 6-96)

See ANSI A117.1 - (current revision) for specific ramp requirements.



FL. 6-95



FL. 6-96 Conceptual Drawing Entrance

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.2 Architecture 2.4.3

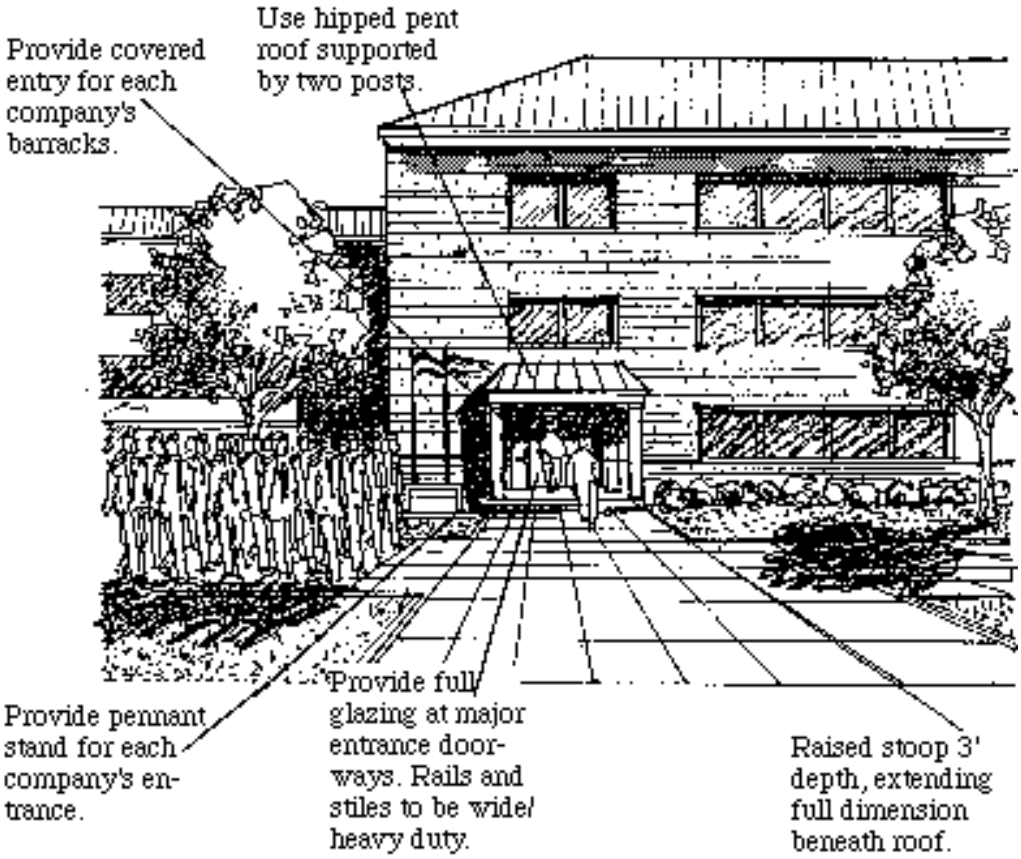
6.2.5. Entrances LT

Troop Barracks
Entrances to Buildings

General Notes

Special attention should be applied to creating a pleasant environment at the entrance to barracks. (See FL. 6-97), (See FL. 6-98)

FL. 6-97
Existing Barracks Entrance



FL. 6-98

6.2 Architecture 2.5.1

6.2.6. Alterations/Additions GW LT CC SS TF FH OS

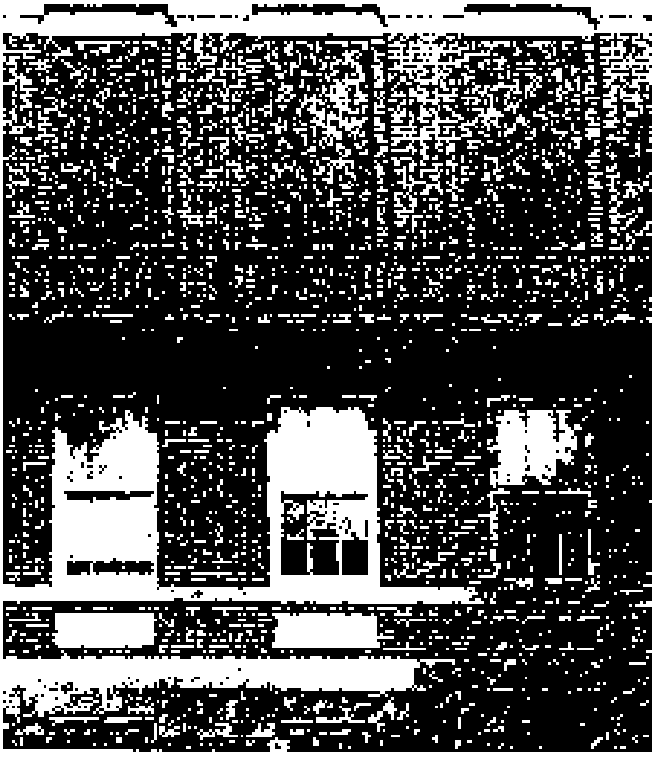
Securing Existing Openings

Where an existing brick masonry opening must be closed, allow the original profile of the opening to remain so that the overall effect of the building's fenestration will be preserved. (See FL. 6-99)

Do this by infilling with masonry to match the surrounding brick color, pattern, and coursing.

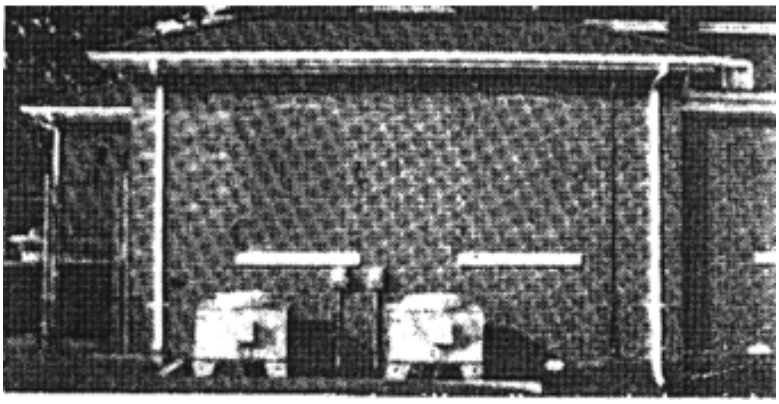
Infill masonry to be flush with or recessed back from surrounding wall plane.

Do not damage existing jambs, head or sill of masonry opening. (See FL. 6-100)



FL. 6-99

Secured windows maintain scale of opening through recessed infill.



FL. 6-100

Secured windows are flush with wall plane, but maintain proportion of opening.

6.2 Architecture 2.6.0

6.2.6. Alterations/Additions GW LT CC SS TF FH OS

Materials & Colors

General Notes

Purpose

The purpose of this section is to set guidelines for color and material selections on new construction, renovations and maintenance work. These selections have been coordinated to establish a strong unified image for the post.

The materials and colors of the major permanent buildings already existing on post have been taken into consideration and in some cases are to be used as the basis for matching new materials. The specific buildings to be matched are cited in the following pages.

Review Procedure

To insure proper coordination, colors and materials are to be presented for review by both the project contracting officer's representative and the installation DEH (or representative). The presentation should be made by the project's designer (A/E) or builder (if project does not involve a design A/E). Samples of all major building materials to be used in the project must be presented together. Sizes of the samples must be large enough to give an accurate impression of their appearance and juxtaposition (what is seen next to what) in the completed project. For renovations, samples of major existing materials (such as brick masonry) should be included in the presentation. For large painting projects, a small portion of the total job (such as a single window) should be completed as a sample to be approved before final selection/approval.

Application

For guidelines concerning form, shape, style, and appropriate design applications of these materials and colors, see the previous sections of the Architectural Design Criteria (DC 2.0 through 2.5).

Technical & Engineering Aspects

These Design Criteria area intended for control of the appearance of building materials. Responsibility for adequate and appropriate technical performance of building components lies with the project manager, DEH, architect, engineer, builder and/or construction manager.

Historic Buildings

Material and color selections for renovations and additions to historic buildings are to follow the recommendations and requirements of the Dept. of the Army TM5-801-2 Historic Preseruation Maintenance Procedures and Secretary of the Interior's Standards for Rehabilitation of Historic Buildings. In particular, replacement or repair of exterior building components is to be made with materials which are historically authentic (such as wood windows, ballustrades and porch columns). Where permitted by the references cited above, replacement components may be made of modern materials not previous available, where those materials can be made to closely match the appearance of the historically authentic material (such as aluminum trim mouldings formed to emulate wood). This may be desirable to minimize maintenance improve insulation or increase the life of the building component.

6.2 Architecture 2.6.1

6.2.6. Alterations/Additions GW LT CC TF

6.2.7. Materials and Colors

All Brick Theme

	Materials	Colors
Walls Bldg.	Red brick, common size, running bond or common bond with soldier, sailor or rowlock courses for accent and trim.	Match brick and mortar color of #5000 throughout LT Zone. Match Bldg. #12500 for brick and mortar color in ALMC vicinity. Match Bldg. #1600 for Commissary vicinity, and Bldg. #9025 for PX vicinity.
Cornices/trim	Limestone or cast stone for cornices, entablatures, coping, lintels, sills, column capitals and basement/wainscotting (ie: base of exterior wall below the main floor). Copper or prefinished aluminum trim for eaves, soffits, gutters, downspouts, etc. Plaster soffits at porches, overhangs, and entry recesses.	Natural limestone or cast stone to match *limestone* trim of Bldg. #5000. Aluminum color to match Dark Bronze #46, CS/Kynar 500, as manufactured by Construction Specialties, Inc. Cranford, N.J. (201) 272-5200.
Doors & Windows	Prefinished steel or aluminum entry doors. Prefinished extruded aluminum or aluminum-clad window sash.	Aluminum finish to match #312 *Medium Bronze anodized*. Accent colors for entry doors may be used; match Redwood or Dark Ivy as manufactured by or equal to Kawneer, Norcross, GA (404) 449-5555
Roof	Standing seam metal roofing prefinished. Insulated glass for windows, doors, clerestories, transoms and skylights.	Match *Dark Bronze* No. 46, CS/Kynar 500, as manufactured by Construction Specialties, Inc. Cranford, N.J. (201) 272-5200 Color of Glass to be clear or tinted neutral gray or sepia tones. Glass color samples are to be reviewed with other building materials including brick masonry to insure coodination. No mirror glass, bronze reflective glass, or green glass is to be used.

6.2.6. Alterations/Additions LT SS TF OS

6.2.7. Materials and Colors

Stucco & Brick Theme

	Materials	Colors
Walls	Stucco with brick wainscotting up to first floor sill height. Running bond brick with rowlock or soldier course at top of wainscotting	Stucco base color to match # 5 *Eggshell Cream* as manufactured by Dryvit, Warwick, RI (401) 822-4100; #23 *Choco-late Malt* may be used for trim color.
	Industrial metal wall panels may also be used for engineering and warehouse areas.	Match color of bldg. #7143.
Cornices/trim	Prefinshed aluminum flashing, coping, fascia, gutters and trim	Match *Dark Bronze* #46 CS/Kynar 500, as manufactured by Construction Specialities, Inc. Cranford, NJ (201) 272-5200
Doors & Windows	Prefinished extruded aluminum or alluminum-clad window sash.	Metal finish to match #312 *Medium Bronze* anodized. Accent colors for entry doors may be used; match *Redwood* or *Dark Ivy* as manufactured by Kawneer, Norcross, GA (404) 449- 5555
	Prefinished steel or aluminum entry doors.	
Roof	Standing seam prefinished metal roofing	Match *Dark Bronze* #46, CS/Kynar 500, as manufactured by Construction Specialities, Inc. Cranford, NJ (201) 272-5200.
Glazing	Insulated glass for windows, doors, clerestories, transoms and skylights.	Color of glass to be clear or tinted gray. Glass color samples are to be reviewed with other building materials including brick masonry to insure coordination. NO mirror glass, bronze reflective glass or green glass is to be used.

6.2.6. Alterations/Additions FH

6.2.7. Materials and Colors

Family Housing Neighborhoods

	Materials	Colors
Walls	Brick and Siding for new construction Vinyl siding may also be used for renovations and insulation.	Match existing colors and/or coordinate with existing permanent materials on neighborhood basis. A range of 2 or
3		
	For alterations and repairs, match or approxiamate original materials	pastel colors may be used within each neighborhood to provide variation and individual identity, eg. match *Autumn Yellow, Georgetown Blue* and *Willow Green* vinyl siding as mfd. by Certainteed Corp., Vally Forge, PA (800) 638-3270.
	Note: Coordination of new materials and colors in existing neighborhoods is highly specific and must be carefully directed on a project-by-project basis.	
Cornices/trim	Prefinished aluminum or vinyl	Match siding colors.
Doors & Windows	Residential windows to be prefinished aluminum or alunimum clad casement double-hung windows. Replacement sash to comletely fill existing openings (no filler panels). Vinyl-clad sash may be considered as an option.	Baked enamel white or off-white; all units to match. Cordinate with entry door and other metal trim color.
	Residential entry doors to be prefinished aluminum clad insulated doors. 6-panel style is recommended for the front door; 9-light with two panels beneath for rear door. Vinyl-clad doors may be considered as an option.	Baked enamel white or off-white; match window sash color.
Roof	Asphalt/Fiberglass blend shingles in standard width and length.	Color of shingle is to emulate the color of slate, which is a cool gray (tans and browns emulate the apperance of wood and are not recommended).
	Low-pitched roofs in areas B and C are to have bank run gravel ballast over their existing b.u. roofing.	
Glazing	Insulated glass for windows, doors, clerestories, transoms and skylights.	Color of glass to be clear or tinted gray tones. Glass color samples are to be reviewed with other building materials including brick masonry to insure coordination. No mirror glass is to be used.

Design Criteria Section

3 Landscape

6.3 Landscape 3.0

6.3.1. Introduction GW LT CC SS TF FH OS

The main street tree throughout the post is the Willow Oak, and it is recom-mended that its use be extended on primary roadways in highly visible zones. Lee Avenue, in the vicinity of the PX and the Officers' Club, would be an excellent location to continue the use of the Willow Oak. (See FL. 6-101) Care should be taken not to overuse species that are heavily used on post; carefully mix in other species suitable for street tree use (already used on post) such as Red Maple, London Plane, Red Oak, Norway Maple, and Sugar Maple. Some sections on Adams Avenue contain American Elm; due to Dutch Elm disease, a good substitute would be Zelkova serrata (Japanese Zelkova).

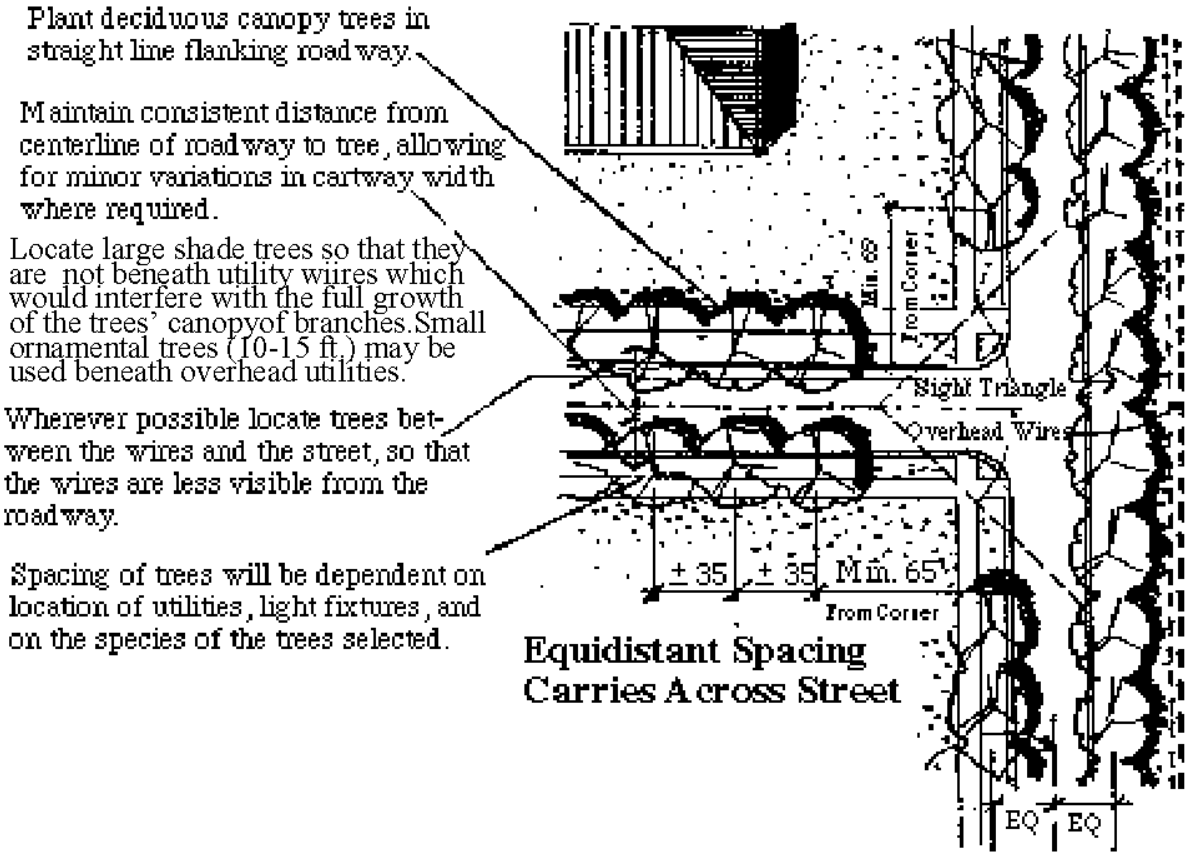
Screening purposes would best be achieved by the use of White Pine, Japanese Black Pine, Norway Spruce, and Canadian Hemlock. Existing Loblolly Pine stands should be supplemented with understory plantings.

The following species should be dis-couraged from use for street tree and lawn use: Eastern Red Cedar, Ginko, Loblolly Pine (reserve to natural areas), and American Elm (use recom-mended substitutes). Trees with low branching characteristics (i.e. Pin Oak) are not recommended for street and parking lot use.

FL. 6-101
Willow Oaks often line roadways throughout the post.

6.3 Landscape 3.1

6.3.2 Planting Street Trees GW LT CC SS TF FH OS



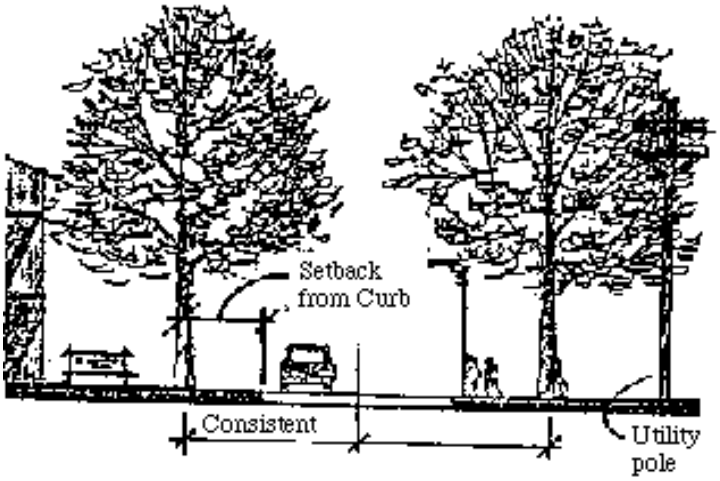
FL. 6-102 Conceptual Plan

Recommended Minimum Setback from Curb/Edge of Road to Center Line of Tree* (See FL. 6-102)

Primary Roadway	min. 10'
Secondary Roadway	min. 10'
Tertiary or other Roadways	min. 5'

* Individual conditions and restrictions may affect placement of street trees (i.e. overhead wires, paved walkways, etc.).

* Maintain a clear line of sight at intersections free of any visual obstructions. (See FL. 6-103)



FL. 6-103
Conceptual Section

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.3 Landscape 3.2.1

6.3.3 Screening GW LT CC SS TF FH OS

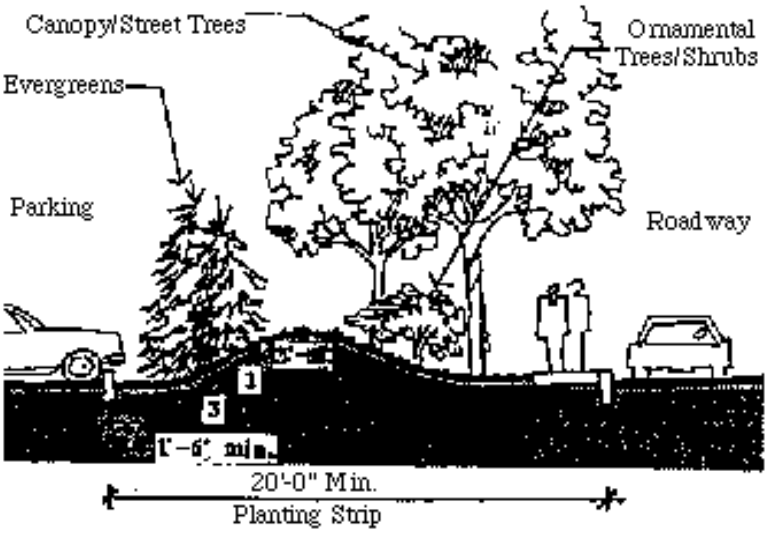
Screening Parking - Planting & Berms

General Note:

* In areas of high visibility, parking areas should be screened or visually buffered from roadways, housing and administrative buildings.

Bermed Planting Strip

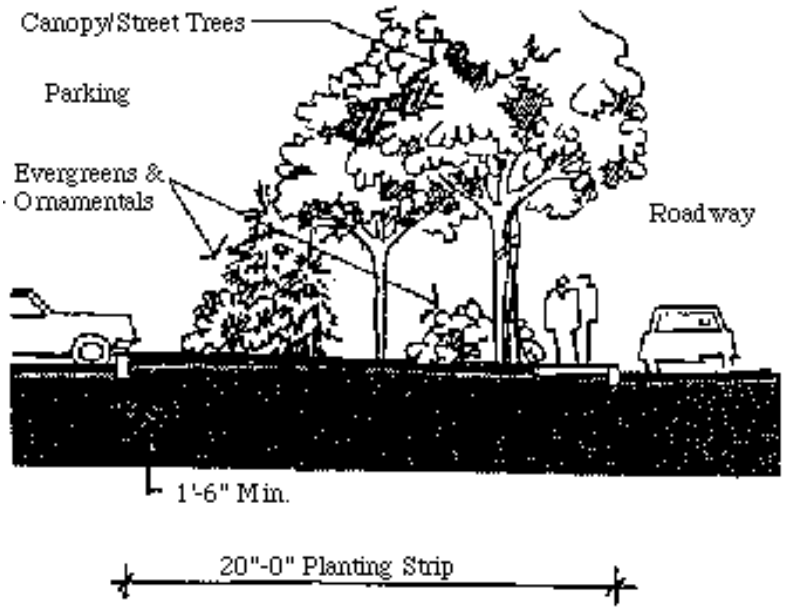
* An earth berm 3' high can be used to create a landscaped visual buffer. Planting should be placed at bottom or lower part of slope. Do not plant on top. Low maintenance ground cover should be used to cover remaining areas. Larger canopy street trees should be used closer to street. See DC 3.6 for recommended planting.
(See FL. 6-104)



FL. 6-104
Bermed Planting Strip

Planting Screen

* A landscaped planting strip can be used to screen negative visual elements. Larger canopy trees should be placed closer to street with evergreens and ornamental shrubs forming a more consistent visual barrier. See DC 3.6 for recommended planting.
(See FL. 6-105)



FL. 6-105
Planting Screen

6.3 Landscape 3.2.2

6.3.3 Screening LT CC TF FH

Screening Parking - Low Walls

Masonry Wall

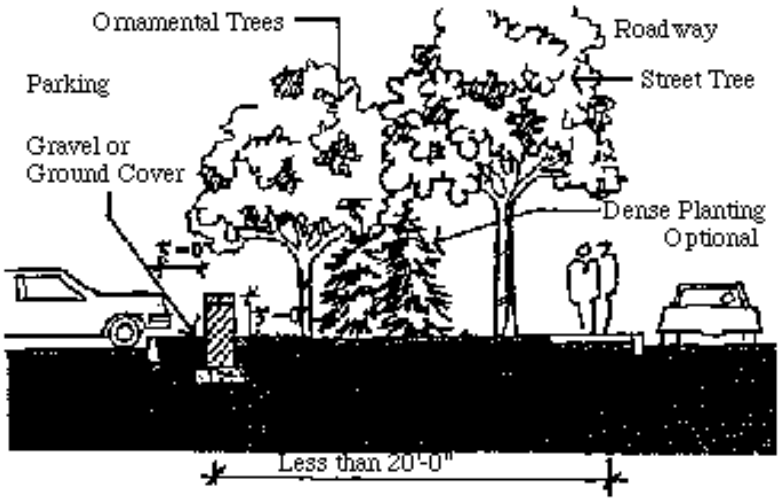
* In areas of high visibility where a 20' planting strip does not exist or when a wall is desired, place a 3' high brick wall to screen view of cars. Low evergreen planting is optional. See DC 3.6. for recommended planting

* Gravel or ground cover should be used in area between wheel stop and wall. (See FL. 6-106)

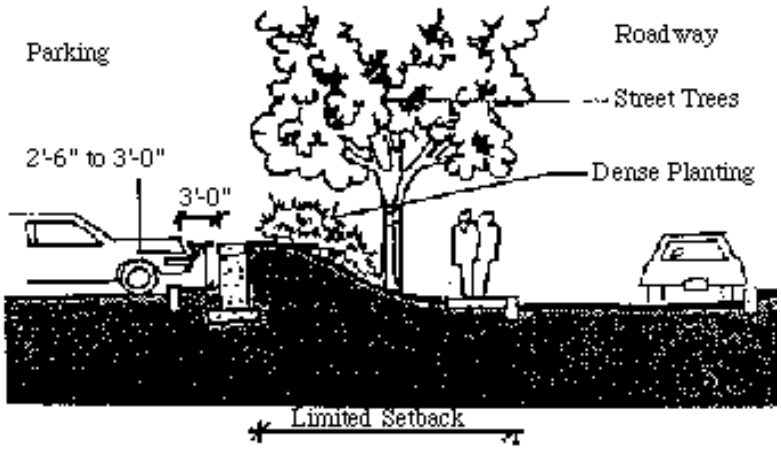
Berm and Retaining Wall

* A retaining wall can be used to hold earth berm and planting where setback is very limited. Concrete or wood railroad ties can be utilized in the appropriate Visual Zone.

* Arrange planting in clusters on side of berm using a dense mix of plant material. See DC 3. 6. for recommended planting. (See FL. 6-107)



FL. 6-106
Masonry Wall



FL. 6-107
Berm & Retaining Wall

6.3.3 Screening

GW LT CC SS TF FH OS

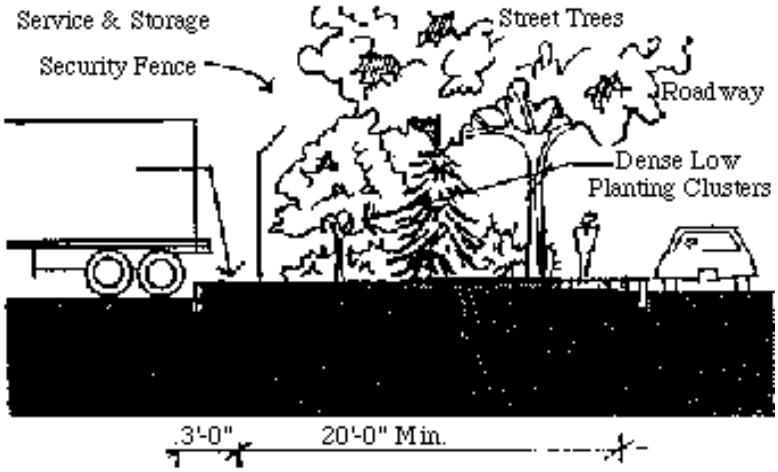
Screening Secured Areas

General Notes:

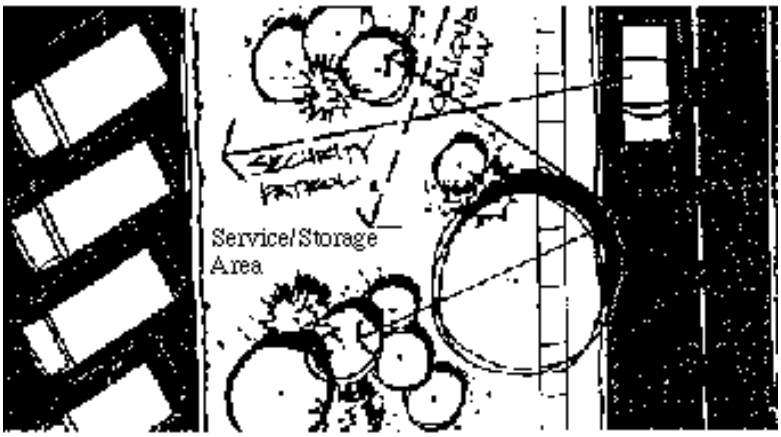
* Where chainlink fencing is required and where visual access from the road for security purposes is required, a system of clustered dense planting allows security patrols to view at right angles the subject area but screens oblique views of the secured areas.
(See FL. 6-108)

or * Arrange planting in informal groupings clusters. Use a mix of evergreen and deciduous species. See 3.6 for recommended planting.

* A low maintenance ground cover should be incorporated to reduce or eliminate mowing and upkeep.
(See FL. 6-109)



FL. 6-108
Planting Buffer Cross Section



FL. 6-109
Planting Buffer Plan (Shows Security Visibility)

6.3 Landscape 3.2.4

6.3.3 Screening GW LT CC SS TF

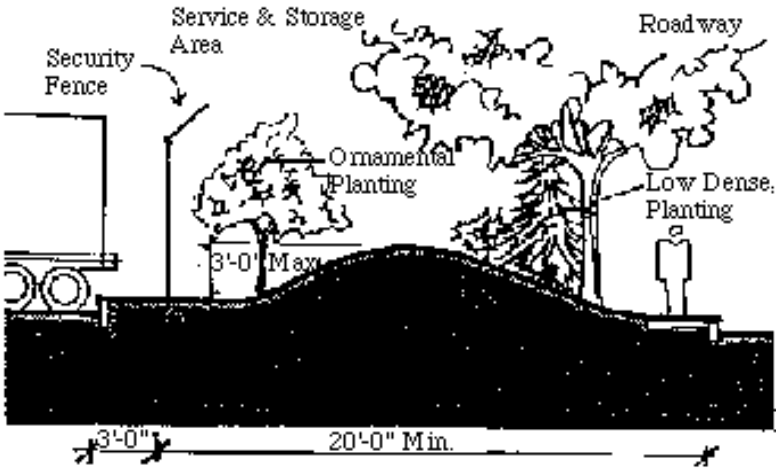
Screening Secured Areas with Earth Berm

General Notes

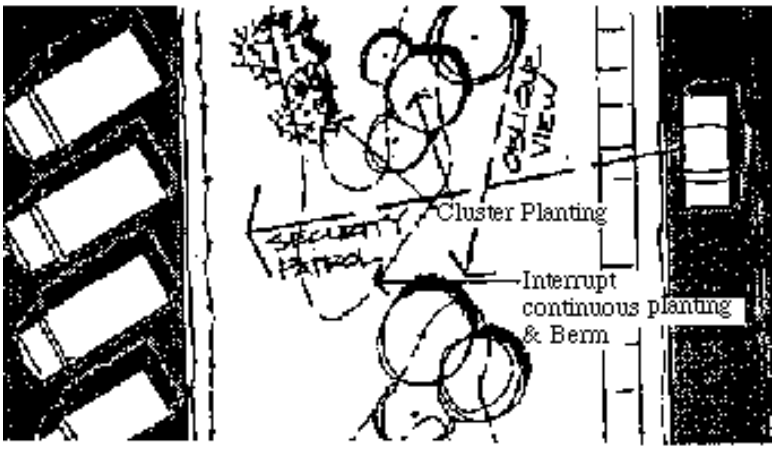
* Where chain link fencing is required and where visual access from the road for security purposes is necessary an earth berm with planting can be introduced to provide a partial visual screen. (See FL. 6-110)

* By varying the location of clustered planting and interrupting the berm security personnel can obtain a perpendicular view of the secured area from the road, while more oblique auto traffic views are screened. (See FL. 6-111)

* A low maintenance ground cover should be utilized on the berm. Larger planting should be located at edge and bottom of berm. See DC 3.6 for recommended planting.



FL. 6-110
Berm & Planting Cross Section



FL. 6-111
Berm & Planting Plan

6.3 Landscape 3.2.5

6.3.3 Screening LT CC TF

Screening Dumpsters
Masonry Wall

General Notes

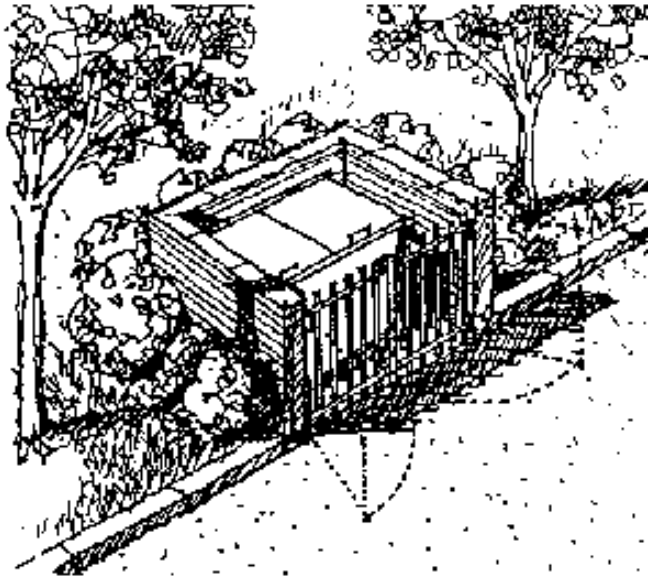
* In areas of extremely high visibility in proximity to major buildings a masonry (brick) dumpster enclosure should be introduced. In areas where the adjacent predominant building material is not brick, a compatible masonry material may be incorporated.
(See FL. 6-112)

* A wood or preferably black metal hinged gate should be incorporated to further screen dumpster.

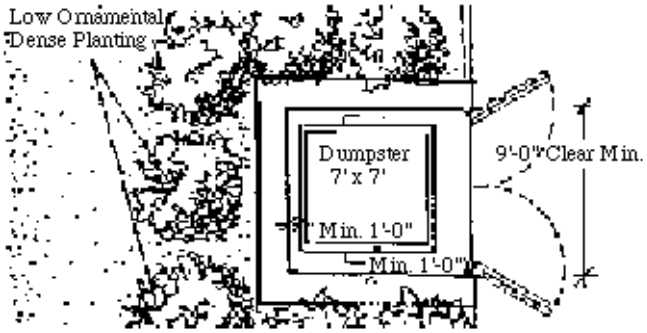
* A concrete pad and footing of appropriate size must be designed for the required load.

* If a larger dumpster is required the dimension of the enclosure must be adjusted accordingly.
(See FL. 6-113)

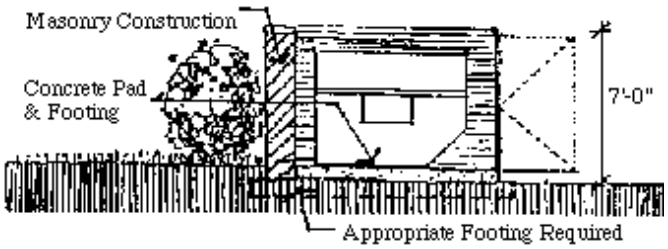
* A hose bib should be located in close proximity to the dumpster enclosure for cleaning purposes.
(See FL. 6-114)



FL. 6-112
Masonry Dumpster Enclosure



FL. 6-113
Plan



FL. 6-114
Section

6.3 Landscape 3.2.6

6.3.3 Screening GW LT CC SS TF FH OS

Screening Dumpsters
Wood Fencing

General Notes

* In areas of high visibility a wood screen wall is desired around dumpster. (See FL. 6-115)

* A 1" x 4" reinforced pressure-treated wood screen is recommended (in a particular visual zone all dumpsters should have consistent finish).

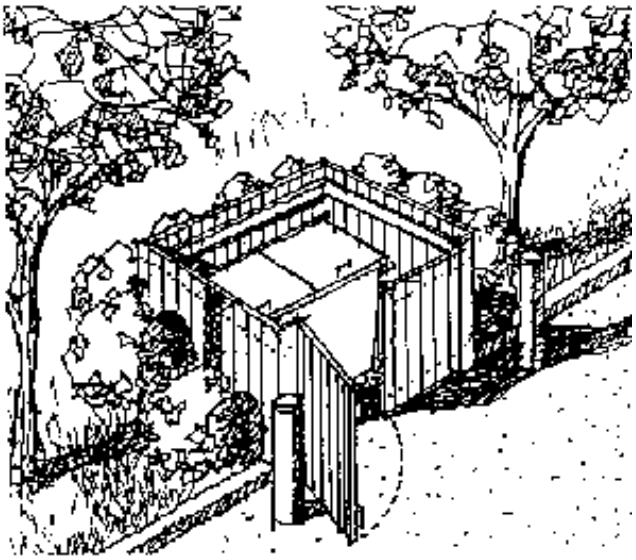
* Concrete filled pipe bollards are recommended to help protect the wood structure and concrete pad.

* When a larger dumpster size is required, dimension should be adjusted accordingly.

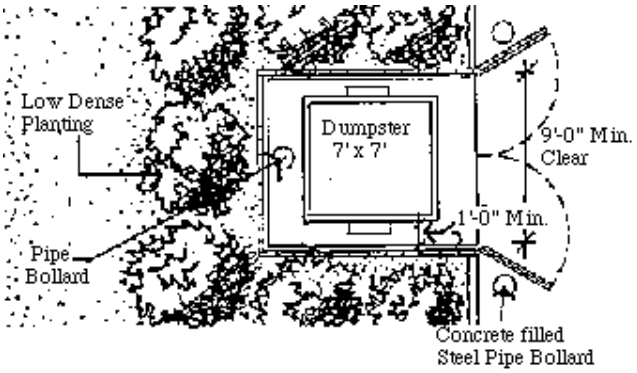
* Low dense planting is recommended around enclosure as illustrated.

* A hose bib should be located in close proximity to the dumpster enclosure for cleaning purposes. (See FL. 6-116)

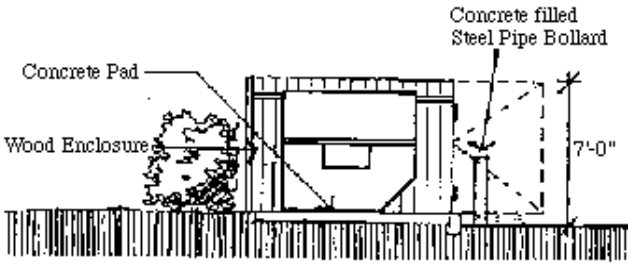
* Dumpsters should be painted a chocolate malt color throughout the entire post to complement other site furnishings (see Fort Lee Post Wide Paint / Exterior Finish Guide). (See FL. 6-117)



FL. 6-115
Wood Dumpster Enclosure



FL. 6-116
Plan



FL. 6-117
Section

6.3 Landscape 3.2.7

6.3.3 Screening GW LT CC SS TF FH OS

Screening Dumpsters
Standard Planting

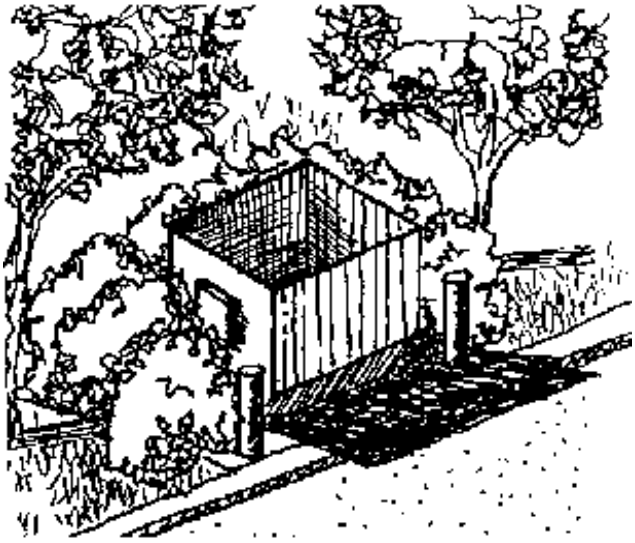
General Notes:

* In areas of lower visibility a dense planting screen should be introduced to visually buffer the dumpster. See DC 3.6 for recommended planting. (See FL. 6-118)

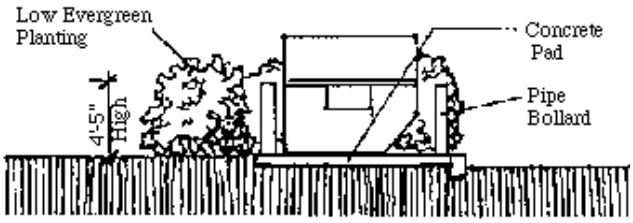
* A concrete pad should be provided, as well as concrete filled pie ballards.

* Planting screen should be 4'-5' high and consist of maintenance free, plant material including evergreens. (See FL. 6-119)

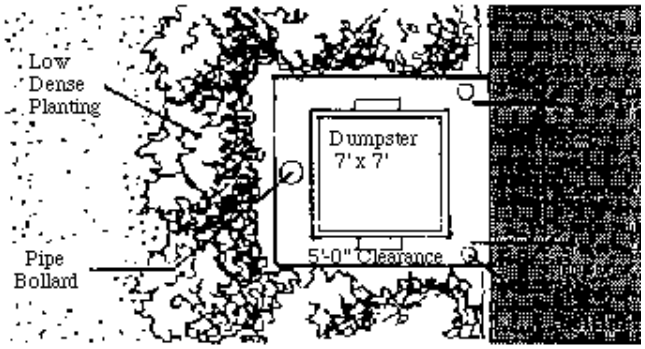
* A hose bib should be located in close proximity to the dumpster enclosure for cleaning purposes. (See FL. 6-120)



FL. 6-118
Planting Screen



FL. 6-119
Section



FL. 6-120
Plan

6.3 Landscape 3.2.8

6.3.3 Screening GW LT CC SS TF FH OS

Locating Dumpsters

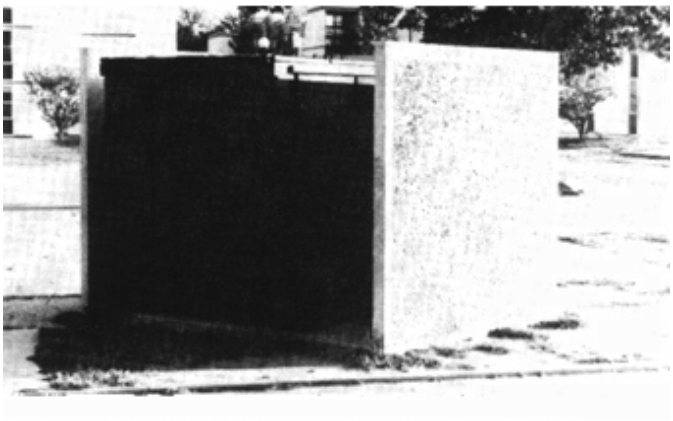
General Notes:

* Dumpsters should be located as required adjacent to loading docks. Access by truck (front end loader) should be readily available.
(See FL. 6-121)

* Screening as described in DC 3.2.5 and 3.2.6 should be incorporated where appropriate.

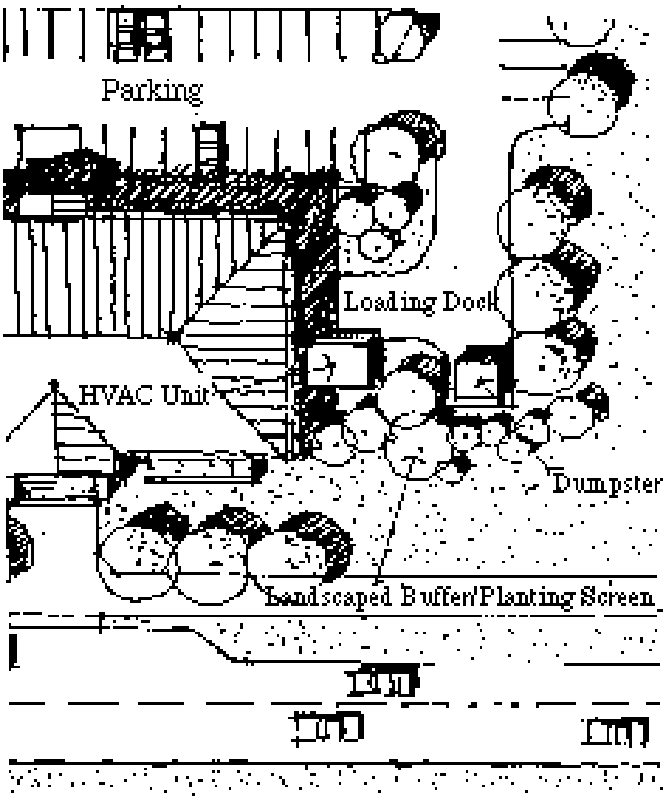
* In areas of less direct visibility and in service areas, no structured screen is required.

* A concrete pad and landscaped buffer should be incorporated See DC 3.6 for recommended planting.
(See FL. 6-122)



FL. 6-121

Dumpsters must be carefully located to minimize visibility while allowing for truck access, unlike this example.



FL. 6-122

6.3 Landscape 3.2.9

6.3.3 Screening SS TF OS

Screening Remote Toilet Facilities

General Notes

Portable toilets should incorporate a wood screen wall.

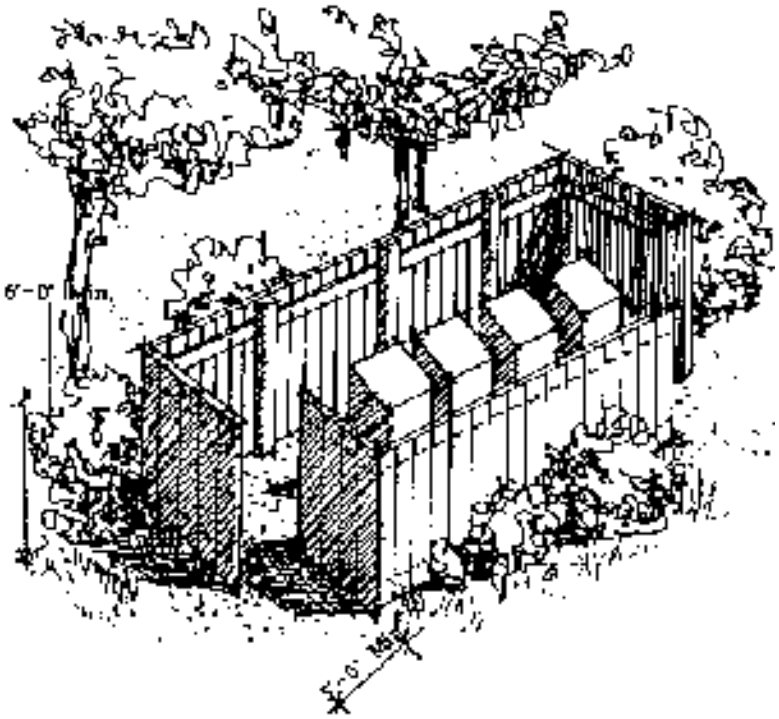
A 1" x 4" reinforced pressure-treated wood screen is recommended.

Sufficient space should be provided at entrance to enclosure wall for maintenance, cleaning, and removal (a minimum of 5' clear).

Gravel or sand should be utilized as ground surface within enclosure.

The portable toilets should be clustered in recreation areas as needed.

Portable toilet facilities should be used only in areas included in the visual zones cited above. (See FL. 6-123)



FL. 6-123

6.3 Landscape 3.2.10

6.3.3 Screening GW LT CC SS TF FH OS

Screening Mechanical Equipment

General Notes

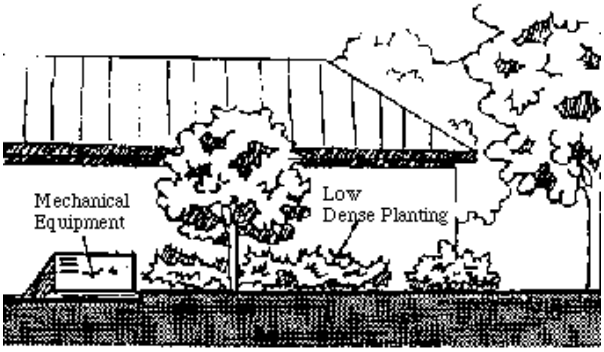
* TRADOC policy dictates that HVAC units should be located at grade on concrete pads adjacent to building wherever possible. (See FL. 6-124)

* In areas of high visibility it is recommended that mechanical equipment should be located on top of building surrounded by a parapet or screen wall.

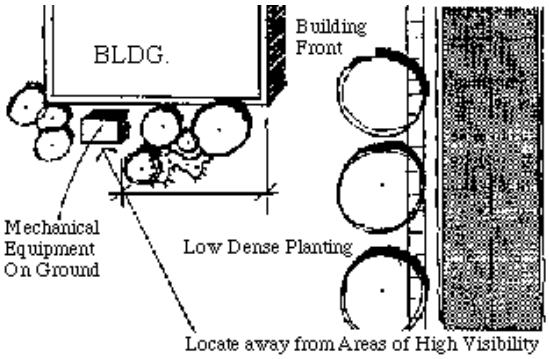
* Where it is not possible to mount HVAC equipment on top of buildings, it should be located at grade away from entrances and areas of high visibility.

* Units should be screened with low dense vegetation and earth berms if possible.

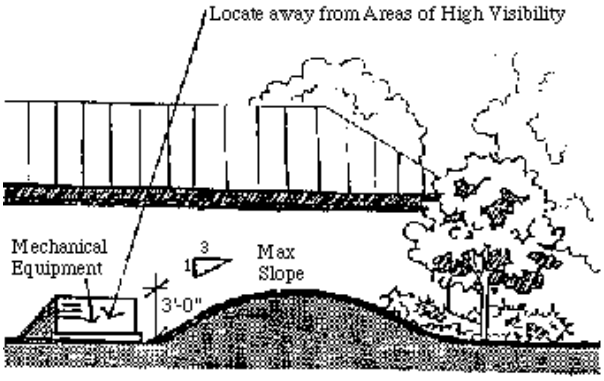
* Sufficient space should be provided for air circulation and easy maintenance. (See FL. 6-125 and FL. 6-126)



FL. 6-124
HVAC Screened by Planting



FL. 6-125
Plan



FL. 6-126
Berm & Planting Screen

6.3 Landscape 3.2.11

6.3.3 Screening

LT CC SS TF
(Page 1 of 2)

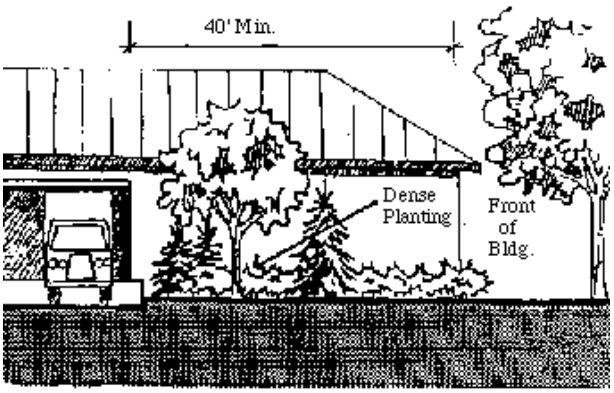
Screening Loading Docks

General Notes:

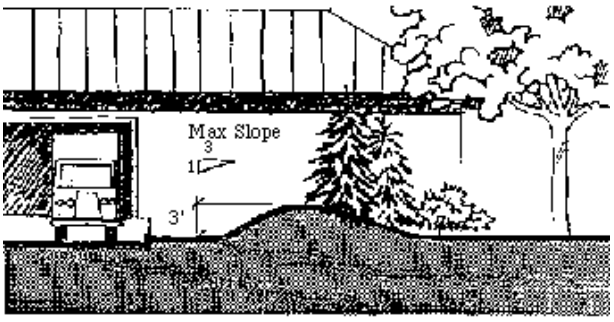
* Where loading docks abut a roadway or area of high visibility, an effort should be made to screen the loading dock from view. This is only appropriate in areas between incompatible zone uses. (See FL. 6-127)

* Landscaped buffer should include a variety of dense evergreen and ornamental planting, and should continue the length of the trucks using the dock. See DC 3.6 for recommended planting. (See FL. 6-128)

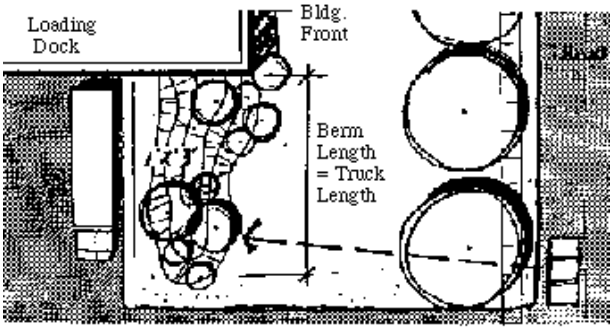
* In areas of extremely high visibility, a landscaped buffer may also be introduced to improve the visual screening. (See FL. 6-129)



FL. 6-127
Landscape Visual Screen



FL. 6-128
Berm & Landscaped Screen Section



FL. 6-129
Berm & Landscaped Screen Plan

6.3.3 Screening

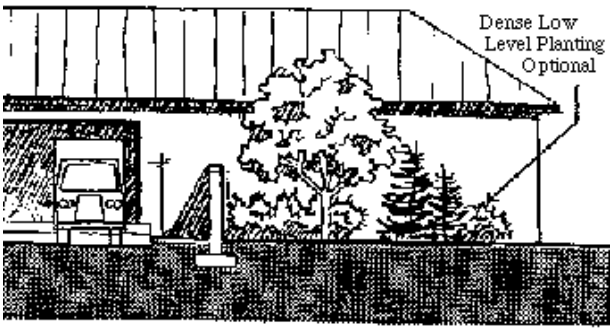
LT CC SS TF
(Page 2 of 2)

Screening Loading Docks

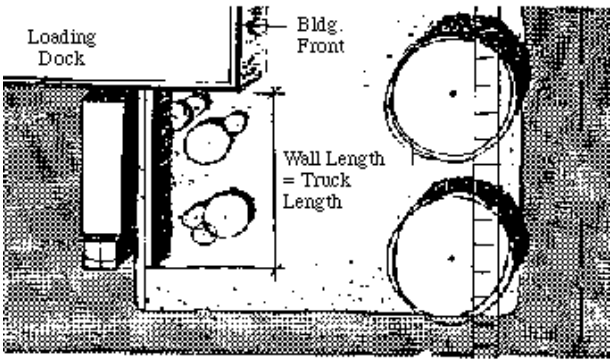
General Notes:

* In areas of extremely high visibility a 5' high masonry (brick) wall should be introduced to screen view of service docks and other deleterious building uses. If building material is other than brick the screen wall should be constructed of the same or a compatible material. Dense low level planting is optional but desirable.

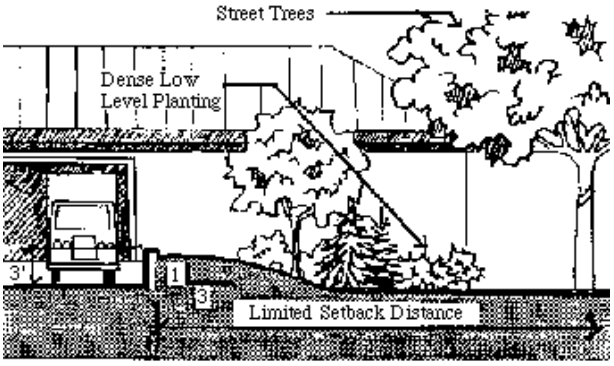
* Where a limited setback distance exists a combination of a retaining wall (concrete or wood railroad tie) and landscaping can be incorporated. See DC 3.6 for recommended planting. Berm should (See FL. 6-130, FL. 6-131 and FL. 6-132)



FL. 6-130
Wall as Visual Screen - Section



FL. 6-131
Wall as Visual Screen - Plan



FL. 6-132
Retaining Wall & Berm Screen - Section

6.3 Landscape 3.2.12

6.3.3 Screening GW LT SS TF OS

Motor Pool Entrance Area

Where entrance gates to motor pool areas are accessed directly from high visibility roads (i.e. primary, secondary, or through-highways), measures should be taken to provide proper access lanes and to screen direct views into the interior of the parking area.

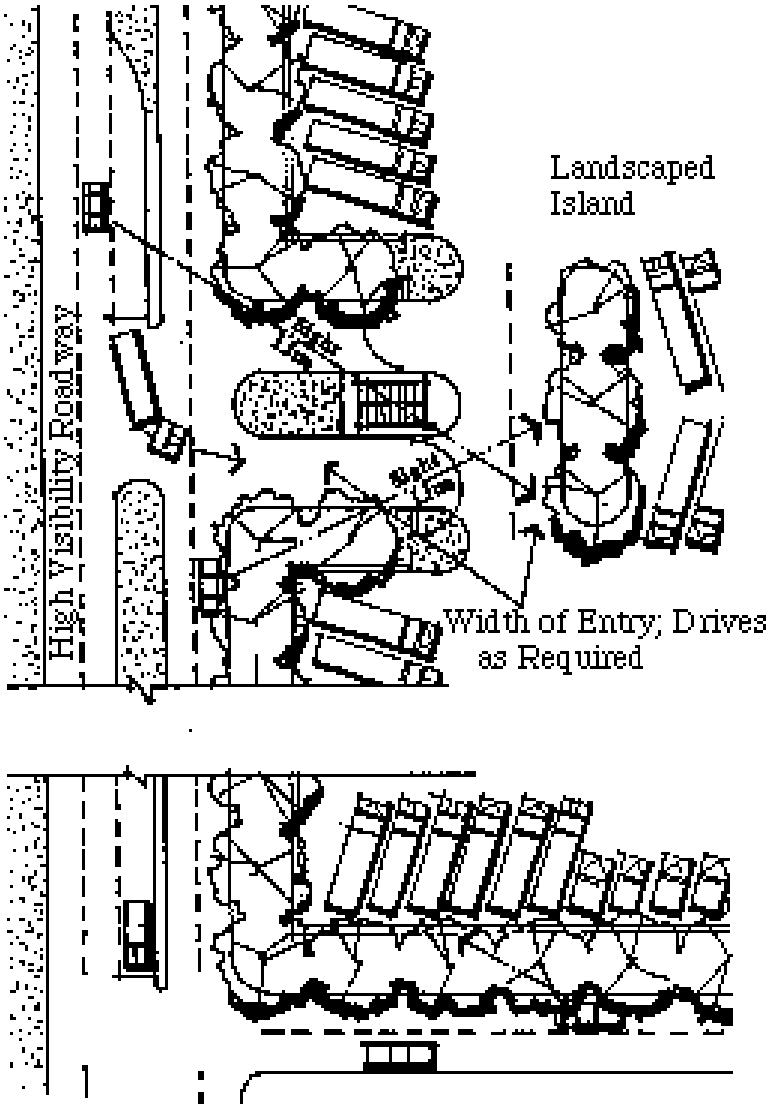
• Provide, where possible, adequate channelized left-hand turning lane.

• Provide landscaped island for security booth.

• Set back fence and security fence 50 ft. (approx.) at entry.

• Provide landscaped island at interior to screen views through gate.

• Screen the edge of the motor pool. Set back the fence 30 ft. and plant screen.
(See FL. 6-133)



FL. 6-133
Conceptual Plan

6.3 Landscape 3.3.1

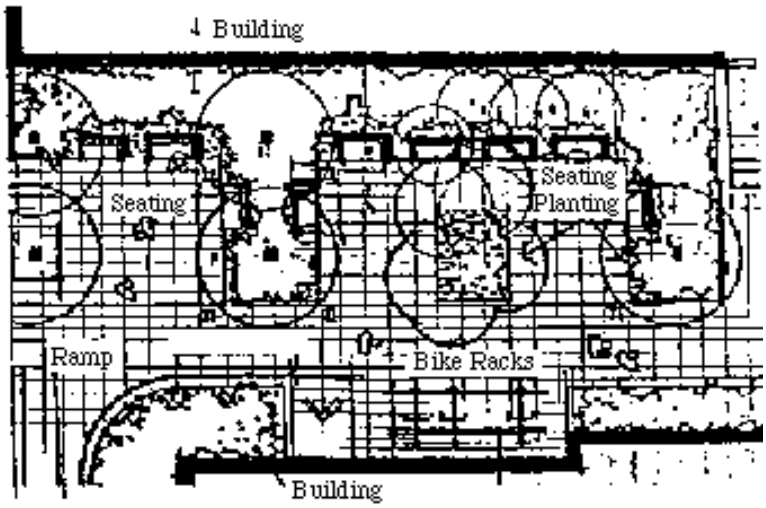
6.3.4 Design Character LT CC TF

Plazas & Courtyards

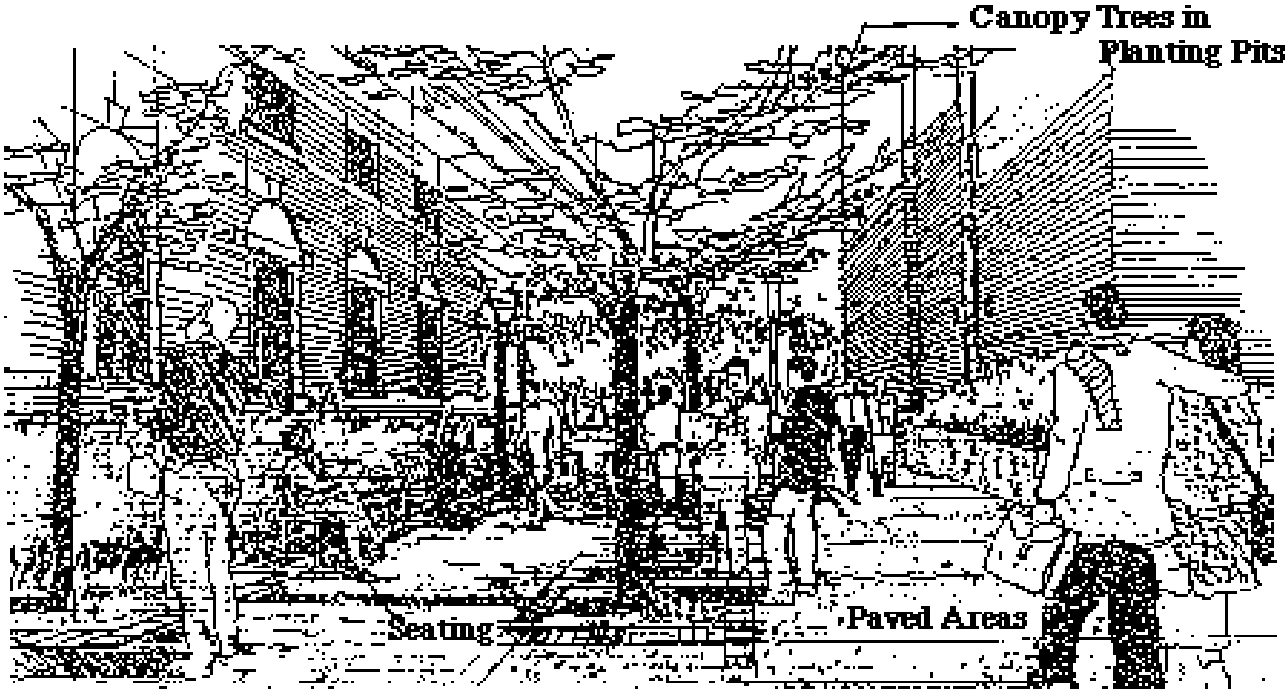
General Notes:

In areas of high visibility and intensive use, the spaces between buildings should be utilized as formal outdoor rooms.
(See FL. 6-134)

Planting, paving and seating should be utilized to create pleasant outdoor spaces for Personnel to interact and relax. See appropriate Design Criteria for recommended materials.
(See FL. 6-135)



FL. 6-134
Conceptual Plaza/Courtyard Plan



FL. 6-135 Conceptual View of Plaza Space between Buildings

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

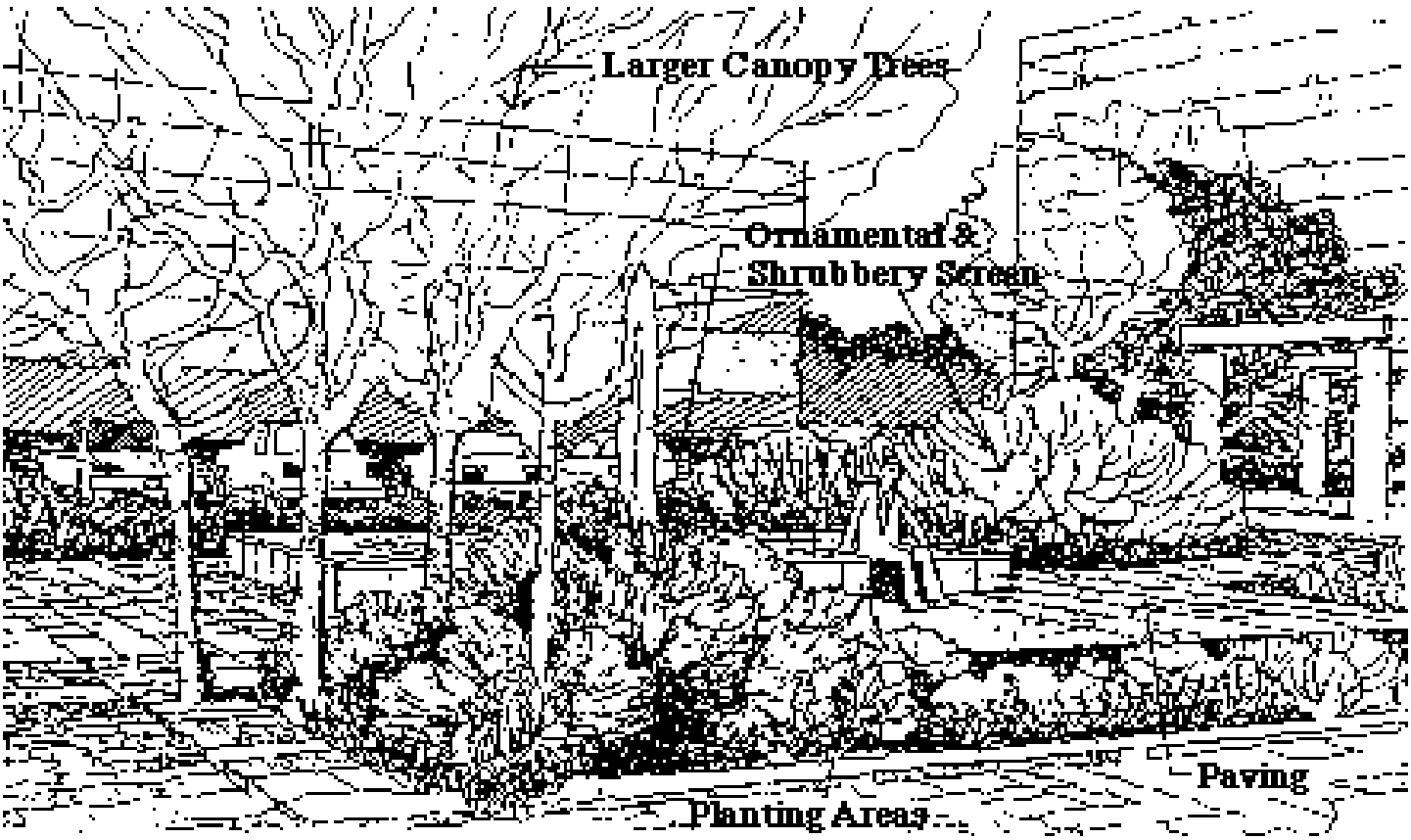
6.3 Landscape 3.3.2

6.3.4 Design Character LT CC TF

In high visibility and high activity areas formal plaza space should be created to provide usable outdoor space.

Planting should be used to define the edges of the space and break up large areas of paving. Large canopy trees should be used to provide shade and low maintenance ornamental plantings should be used in planter areas. See Plant Matrix for recommended plant materials. (See FL. 6-136)

Screen parking and service areas from plazas with low screen walls or with low evergreen hedges.



FL. 6-136 Conceptual Sketch of Plaza

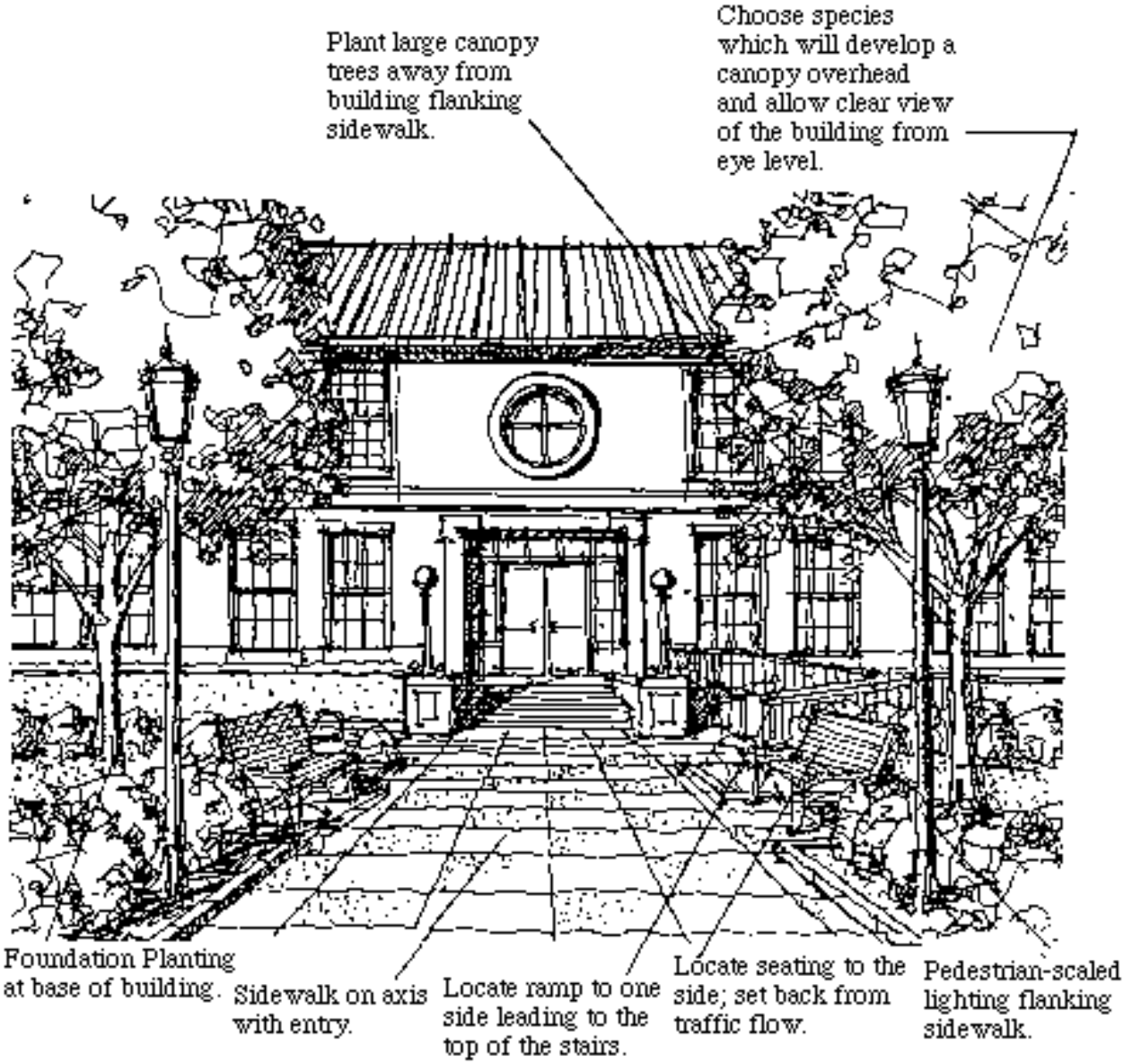
☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.3 Landscape 3.3.3

6.3.4 Design Character LT CC SS TF

Planting/Entrances to Important Buildings

To create a formal approach suitable for an important command building, align the sidewalk to the axis of the main entry. Do not place signs, plantings or other fixtures along that axis. Allow the pedestrian to approach the doorway walking along the centerline. Following the recommendations below for planting, lighting, etc. (See FL. 6-137)



FL. 6-137

6.3 Landscape 3.3.4

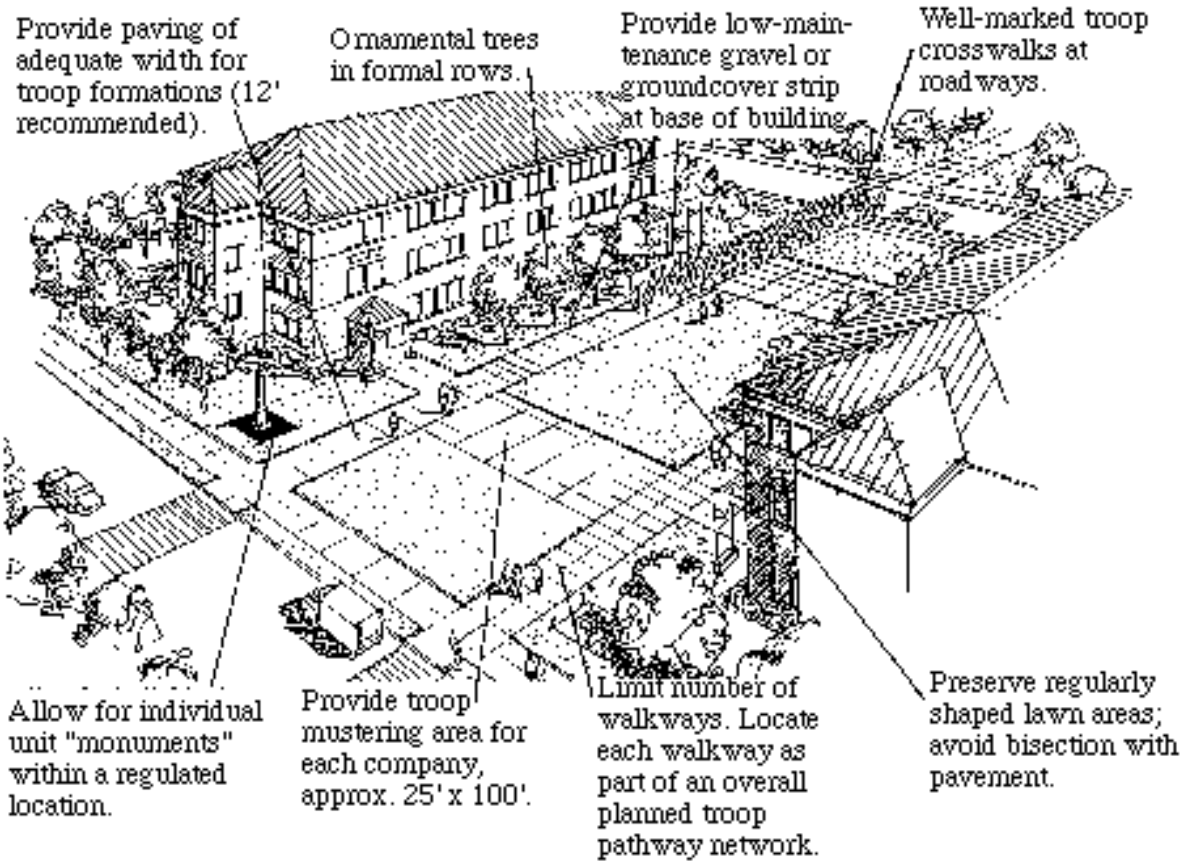
6.3.4 Design Character LT

Barracks Areas

The design of landscaping, paving layout and site furnishings in the vicinity of troop barracks is of critical importance in support of the intense activity that routinely takes place there. (See FL. 6-138) All landscape and pavement materials should be of low maintenance and durable for high intensity use. Site furnishings should be selected for high use and longevity. Following are a series of recommended features which should be provided at each barracks. (See FL. 6-139)

FL. 6-138

Intense troop training activity demands special accommodations in the design of exterior landscaping.



FL. 6-139

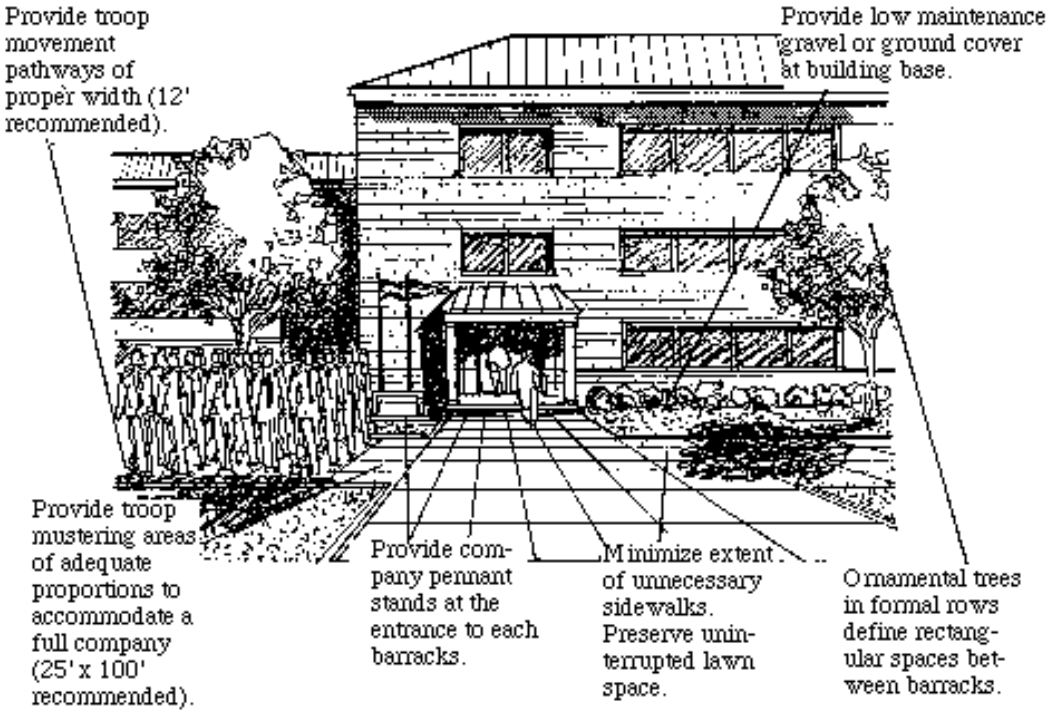
6.3 Landscape 3.3.5

6.3.4 Design Character LT

Troop Barracks Entrance Areas

The design of the environment immediately surrounding troop barracks is of critical importance. The intense concentration of troop activity there must be adequately served.
(See FL. 6-140and FL. 6-141)

FL. 6-140
Typical existing barracks entry.



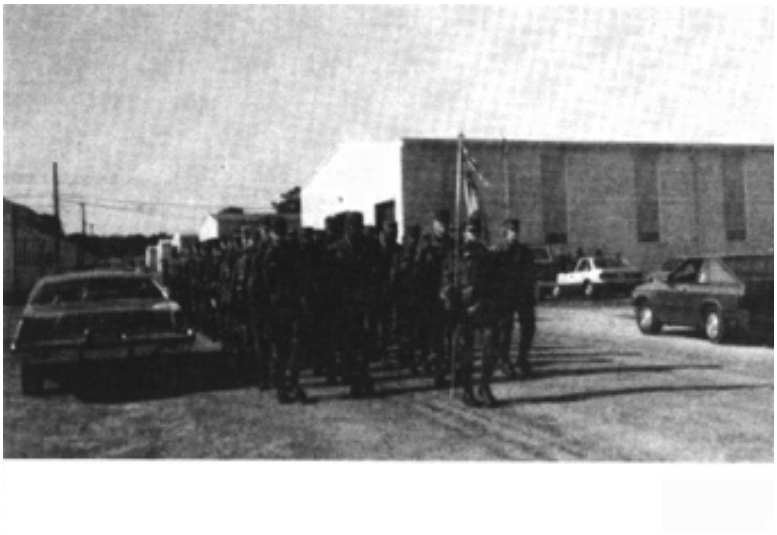
FL. 6-141

6.3 Landscape 3.4.1

6.3.5 Grounds LT

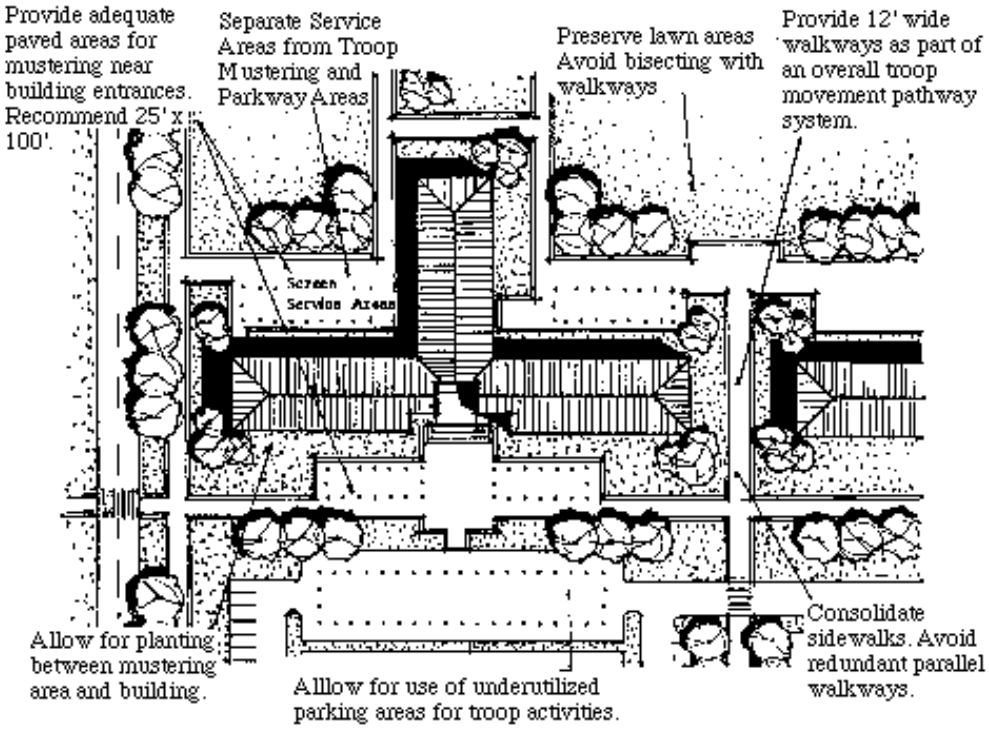
Troop Barracks Grounds

Careful design of paving layout, plantings, and site furnishings is of critical importance in these areas of intense troop activity. The specific needs of companies of foot soldiers are the focus of these design guidelines. They are to be adapted to specific conditions for both new and existing barracks areas. (See FL. 6-142), (See FL. 6-143)



FL. 6-142

Frequently parking lots are used for troop training functions.



FL. 6-143 Conceptual Plan

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.3 Landscape 3.4.2

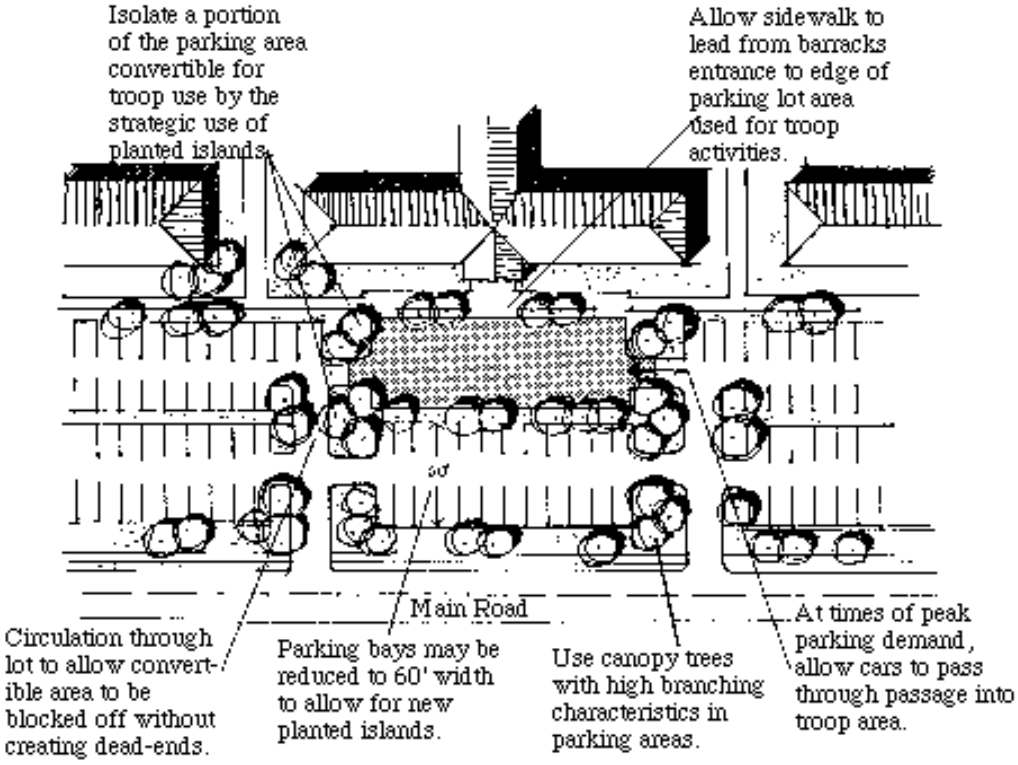
6.3.5 Grounds LT SS TF

Parking Lots Designed for Troop Mustering in Barracks Areas

When parking lots located next to barracks are not fully utilized for parking on a daily basis, they should be landscaped and paved in such a way to create a separate "convertible" area which can be easily blocked-off for troop use. (See FL. 6-144) Peak demands for parking, such as special ceremonies, can be accommodated by opening up the separated aisle for parking. During off--peak periods, the aisle can be converted for troop use by drawing a chain across the entrance drive. (See FL. 6-145)

FL. 6-144

Large parking areas are very often more important as troop activity areas, and should be designed as such.



FL. 6-145 Conceptual Plan

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.3 Landscape 3.4.3

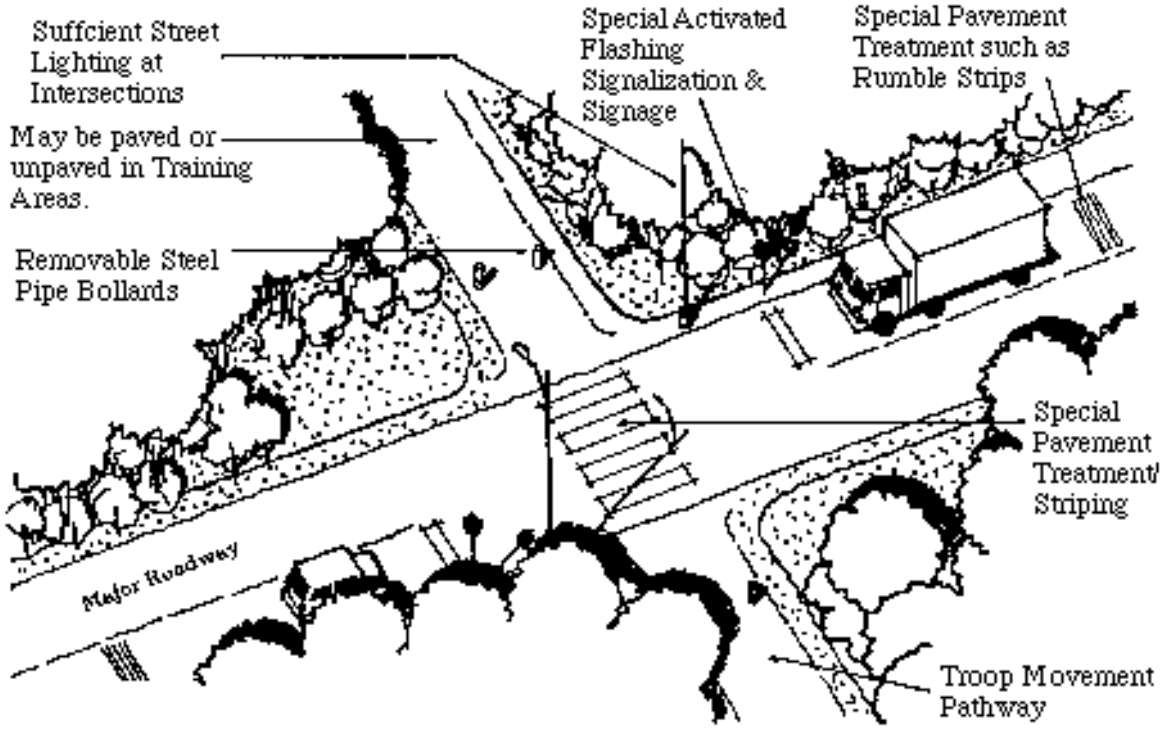
6.3.5 Grounds GW LT CC SS TF OS

Troop Crossings at Major Roadways

Safety is the primary concern at troop crossing points. These points must be clearly marked to command the attention of the motorist and to permit troops to easily and effectively control traffic.
(See FL. 6-146)

The following design features should be used at all important troop crossing points. Specific designs and dimensions must be reviewed by a traffic engineer to insure safety.
(See FL. 6-147)

FL. 6-146
A Platoon of Trainees Crossing Roadway.



FL. 6-147 Conceptual Treatment of Troop Pathway Intersection

6.3 Landscape 3.4.4

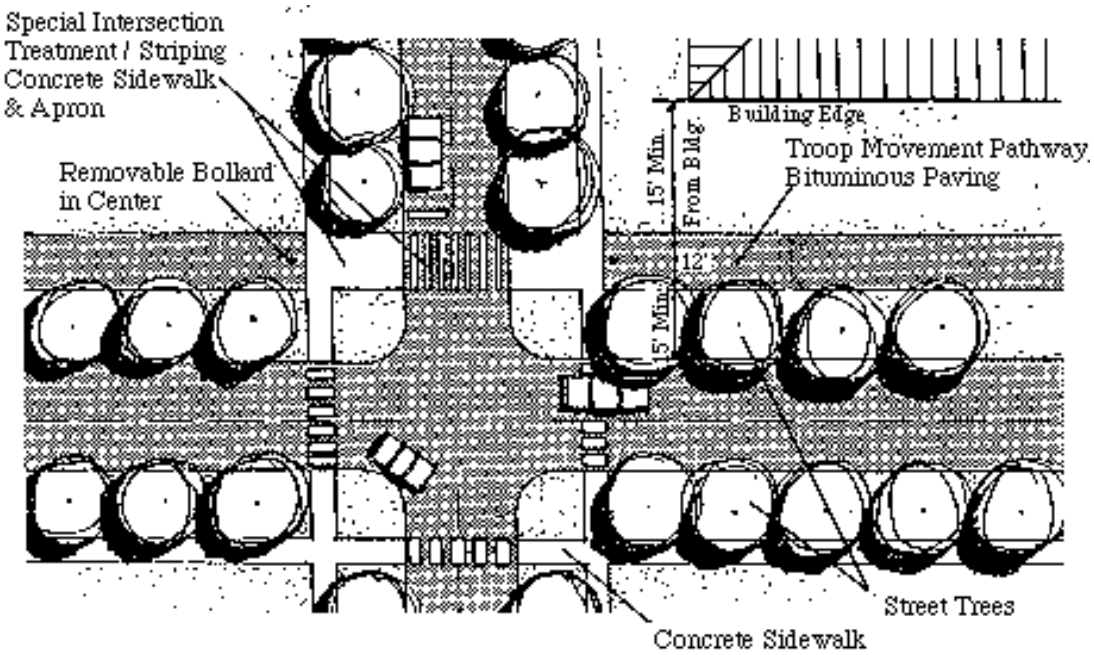
6.3.5 Grounds GW LT CC SS TF

Troop Movement Pathway-
Main Cantonment

A Troop Movement Pathway system should be established to link troop housing, activity and training areas. A 12' wide bituminous pathway with special treatment at intersections should be developed. A removable steel pipe bollard should be located at the intersections, centered in the pathway, to obstruct vehicles using the pathway. (See FL. 6-148 and FL. 6-149)

FL. 6-148

Intense troop training activity demands special accommodations in the design of exterior landscaping.



FL. 6-149 Conceptual Plan of Troop Movement Pathway

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

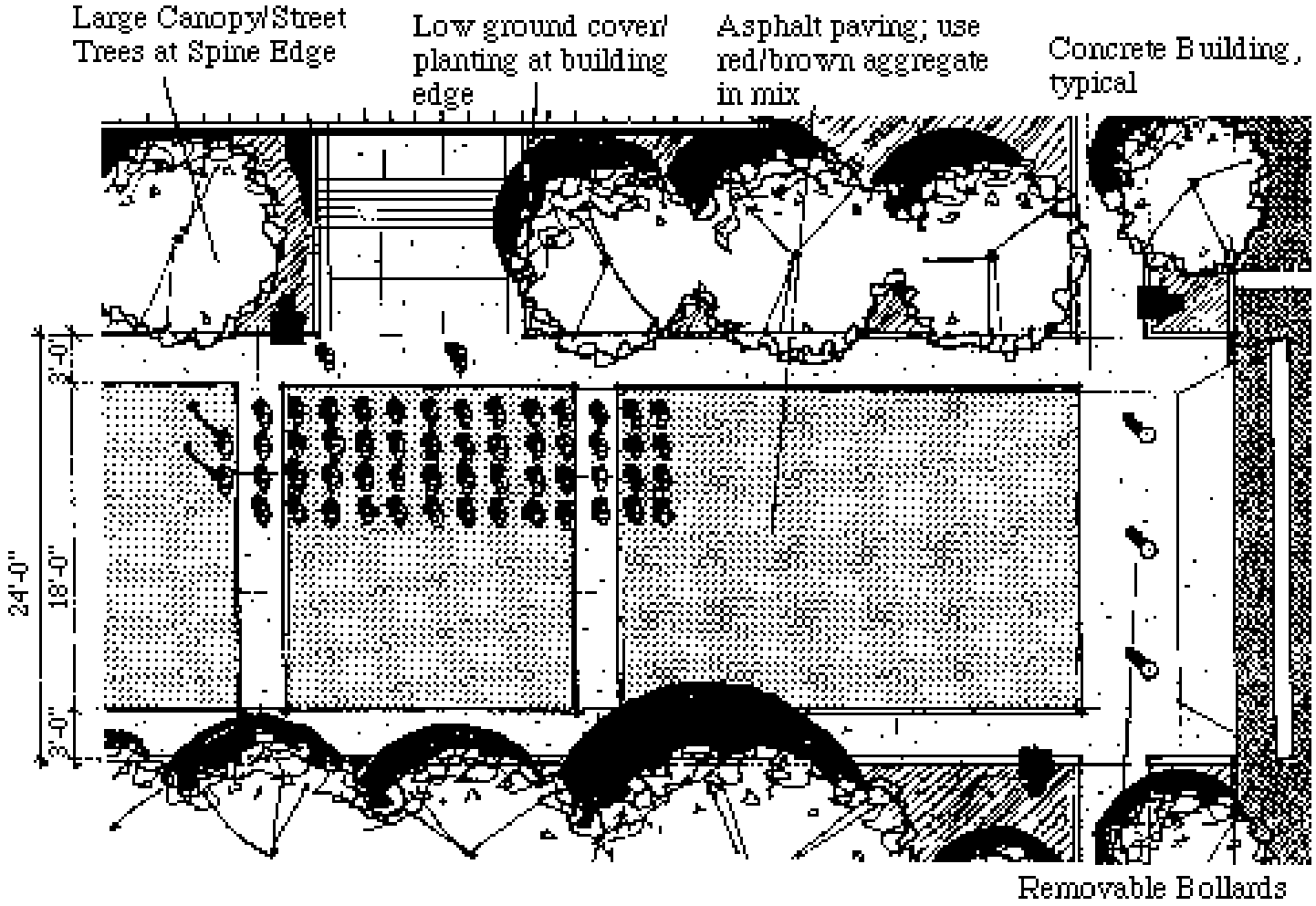
6.3 Landscape 3.4.5

6.3.5 Grounds LT

Troop Movement-Spine Design Detail

General Notes

The Troop Movement Spine will become the major central axis for the Living Training Zone, tying together all activities in this area. Its design should reinforce its primary use. Paving, landscaping, lighting, and street furnishings should follow the appropriate Design Criteria. (See FL. 6-150)



FL. 6-150 Conceptual Plan Troop Movement Spine

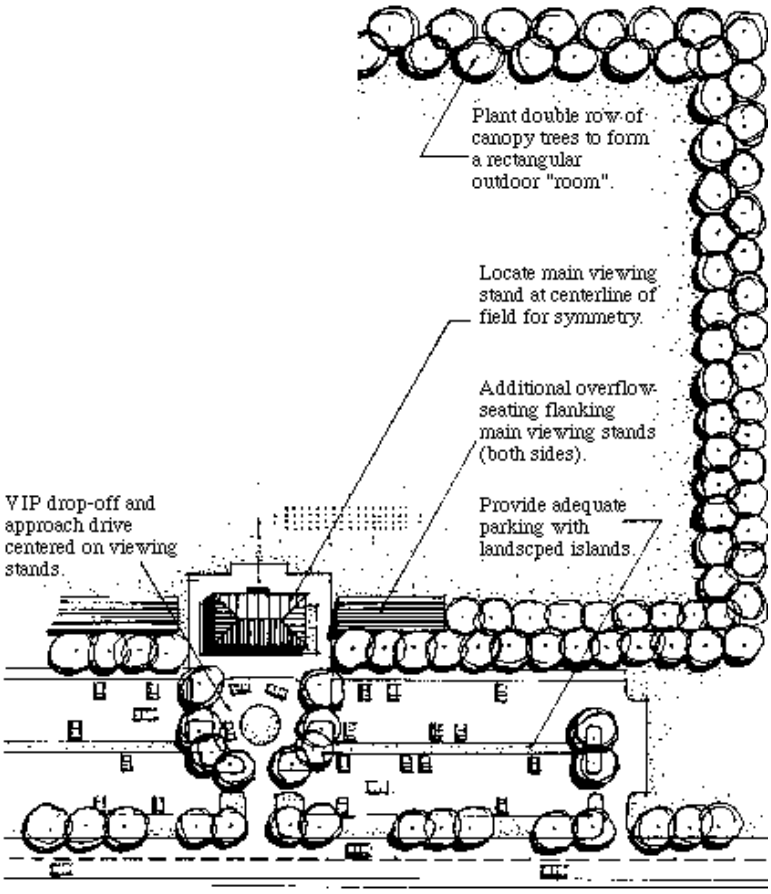
☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.3 Landscape 3.4.6

6.3.5 Grounds LT TF

Parade Grounds & Review Stands

Parade grounds are to be landscaped as formal ceremonial spaces, set off from other open space by a frame of canopy trees. Adjacent buildings and athletic fields appear as distracting and inappropriate backdrops for the large scale formal drills on the parade ground. Set these other facilities and parking areas apart from the parade ground with deciduous and evergreen trees. The formal double row of trees (allee) is to frame the rectangular parade ground to set it apart from other open space and to create a grand outdoor "room" for the post's most important ceremonies. (See FL. 6-151)



FL. 6-151 Conceptual Plan

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.3 Landscape 3.5.1

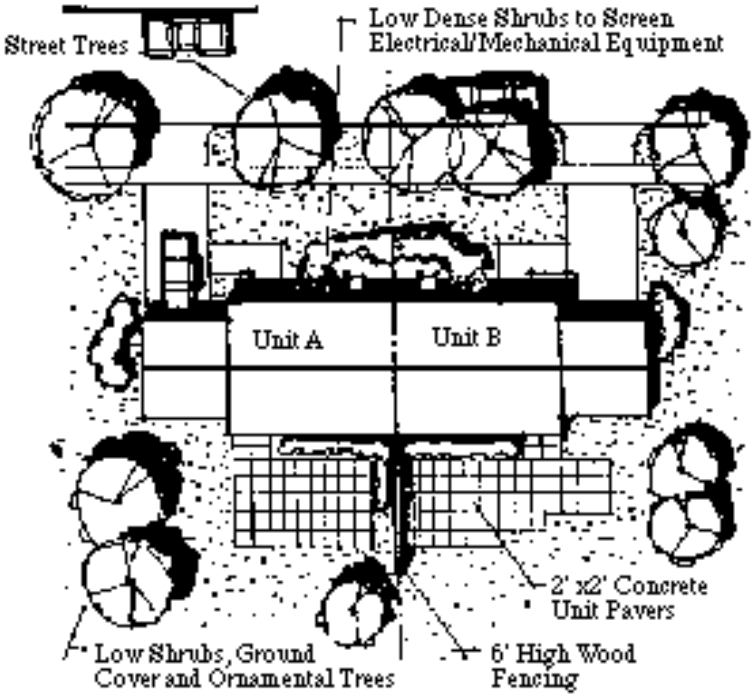
6.3.5 Grounds FH

Family Housing Landscaping Improvements

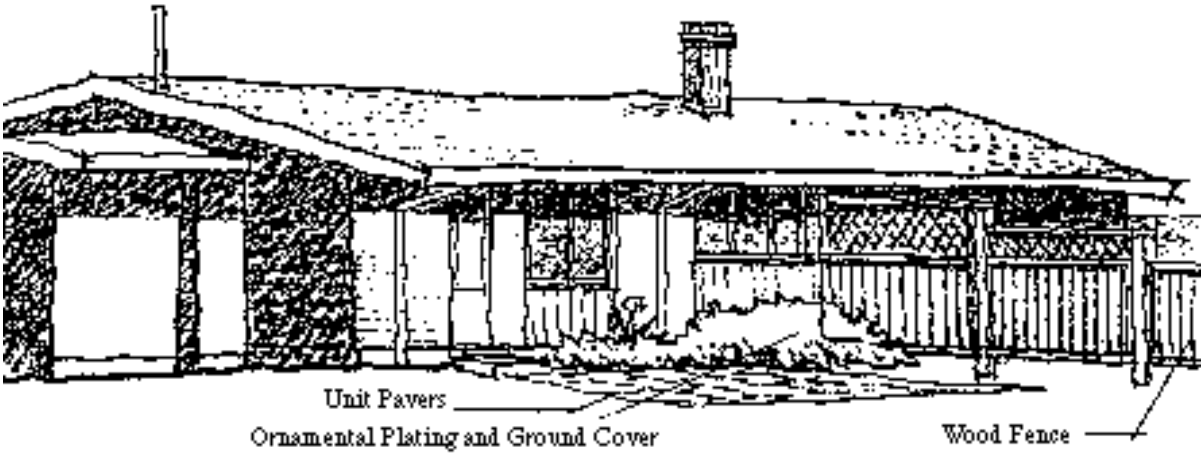
General Notes

* Dense low evergreen shrubs should be used to screen mechanical and electrical equipment in front yards.
* Canopy trees should be introduced along tree lawns and planting strips.
* Unit pavers for patio areas and ornamental and shade plantings should be used in rear yards. Residents should be encouraged to customize their yards.
* Wood 6' high fencing should be used to divide rear yards and create a greater sense of privacy. (See FL. 6-152)

These criteria apply to existing and/or new twin type residential units, where a pair of units are attached, requiring special definition of the rear patio areas. (See FL. 6-153)



FL. 6-152
Conceptual Plan.



FL. 6-153 Conceptual Sketch Rear Yard

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.3 Landscape 3.5.2

6.3.5 Grounds FH

Housing Rear Yard/Patio Treatment

General Notes

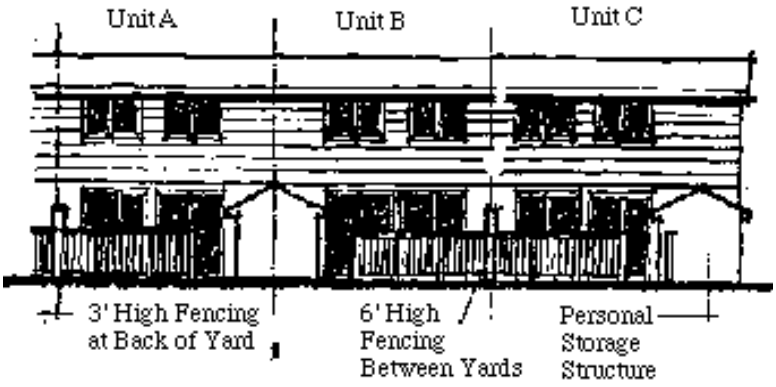
* The rear yards of family housing units should provide more opportunity for individual treatment. (See FL. 6-154)

* Permanent storage buildings of similar materials and colors should be located to provide more private back yard spaces, as well as increased storage space for personal belongings.

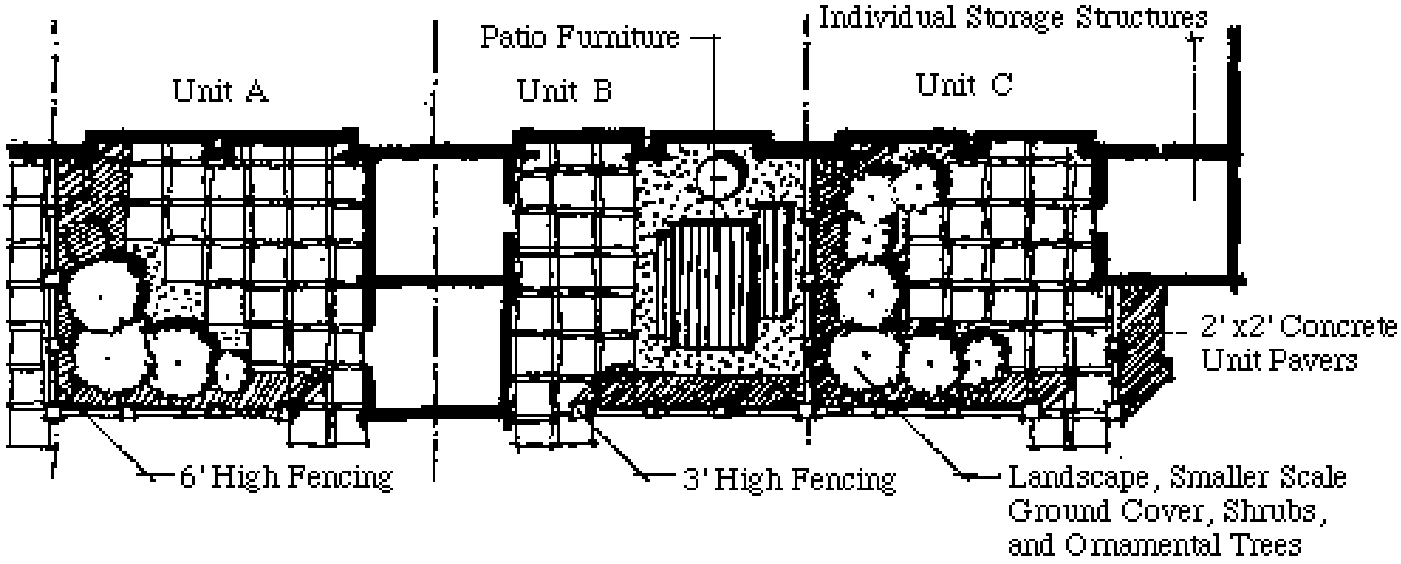
* Concrete 2' x 2' max. size unit pavers should be utilized in conjunction with smaller scale landscape materials in backyard treatment.

* 3' high wood fencing should be used at the back of the yards and 6' high wood fencing between yards should be encouraged.

* Residents should be encouraged to customize their individual yards. (See FL. 6-155)



FL. 6-154
Conceptual Rear Yard Elevation.



FL. 6-155 Conceptual Rear Yard Plan

6.3 Landscape 3.5.3

6.3.6 Buildings GW LT CC SS TF FH OS

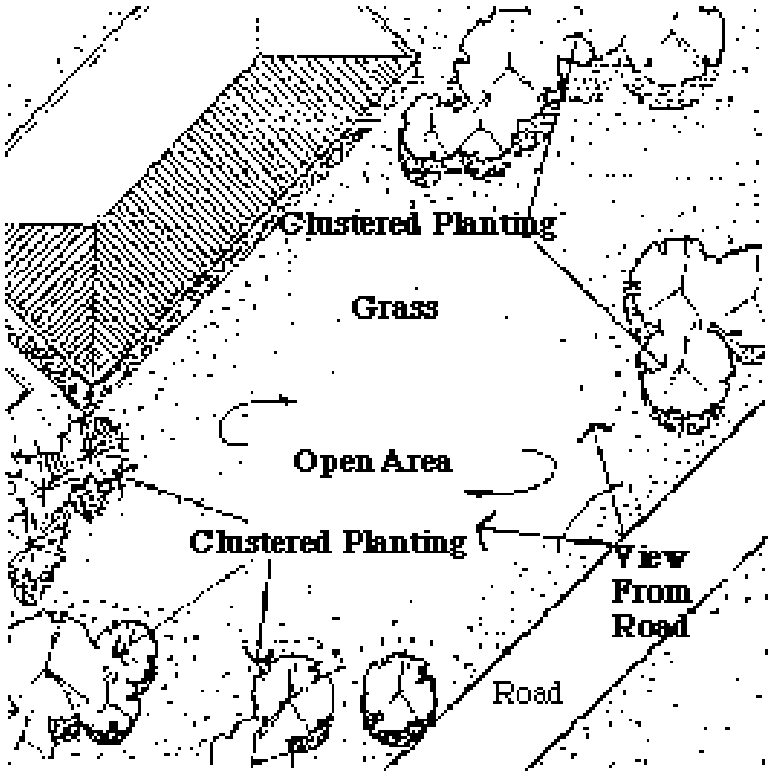
Landscaping in Proximity to Buildings

General Notes:

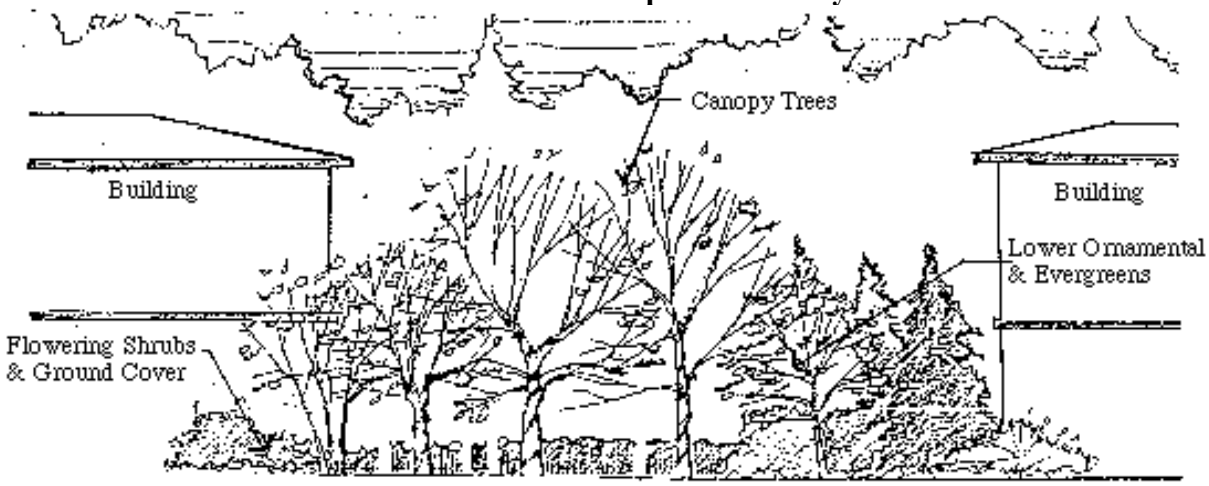
* The spaces between buildings should be of the character of the building architecture and unify the buildings within the visual zone. A variety of open lawn areas and clustered planting should be used to complement buildings, frame open areas, enclose views and add seasonal interest. See DC 3.6 for recommended planting. (See FL. 6-156)

* A mix of canopy trees and ornamental planting of varying sizes should be used. Group planting to form clusters with ornamentals in foreground, canopy and evergreen in background.

* Plantings should be strategically located for purposes of shade screening, and ornamental interest. (See FL. 6-157)



FL. 6-156
Conceptual Plan Layout



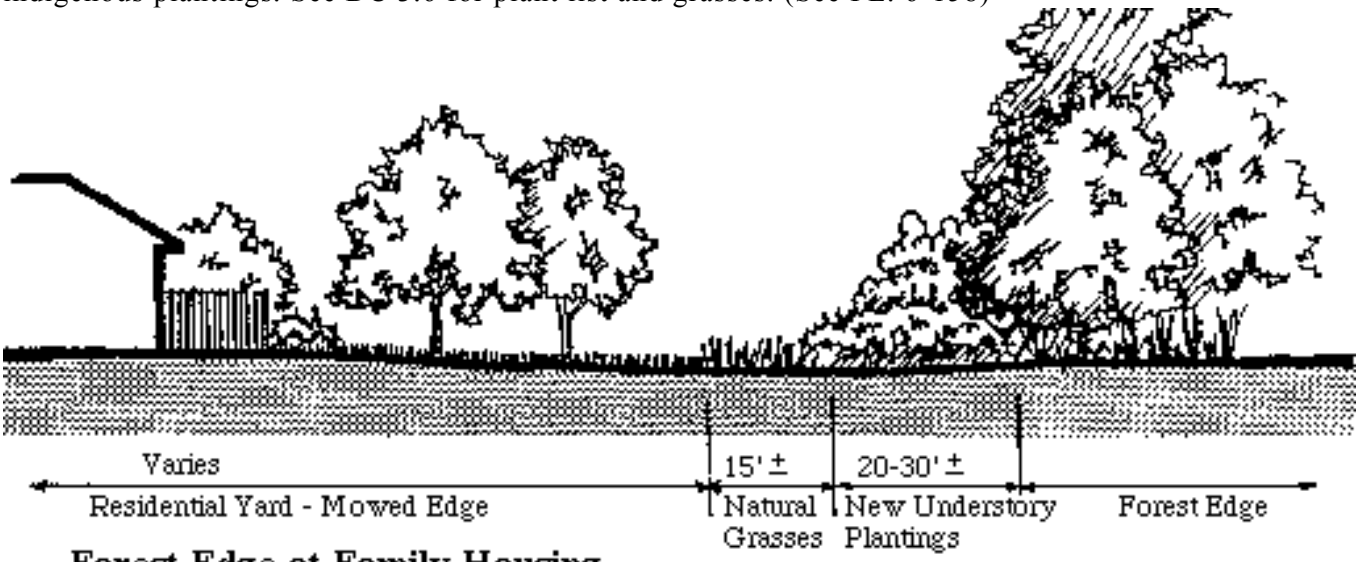
FL. 6-157 Typical Landscaping Between Buildings

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.3.6 Buildings GW LT CC SS TF FH OS

Management of the Forest Edge

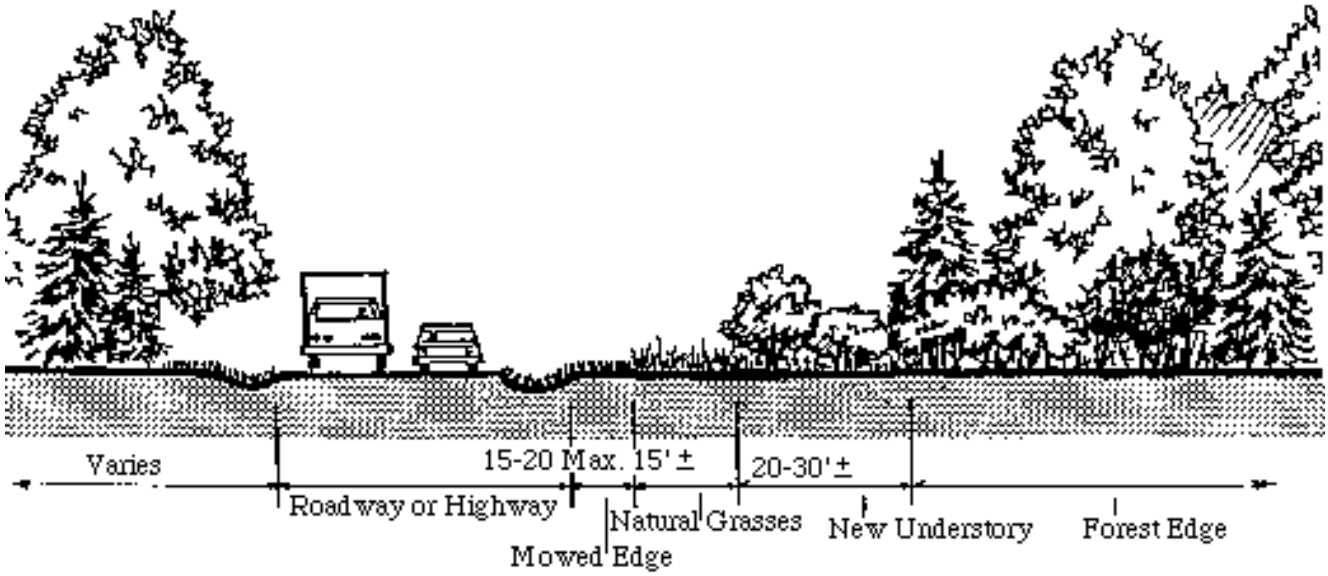
Provide transition areas between residential yard areas and the existing forest edge with natural grasses and indigenous plantings. See DC 3.6 for plant list and grasses. (See FL. 6-158)



Forest Edge at Family Housing

FL. 6-158

Minimize mowing and plant maintenance along roadway edges by using indigenous grasses and plantings 20 ft. from the roadway edge. See DC 3.6 for plant list and grasses. (See FL. 6-159)



Forest Edge along Roadways

FL. 6-159

6.3 Landscape 3.6

6.3.7 Plant Matrix GW LT CC SS TF FH OS

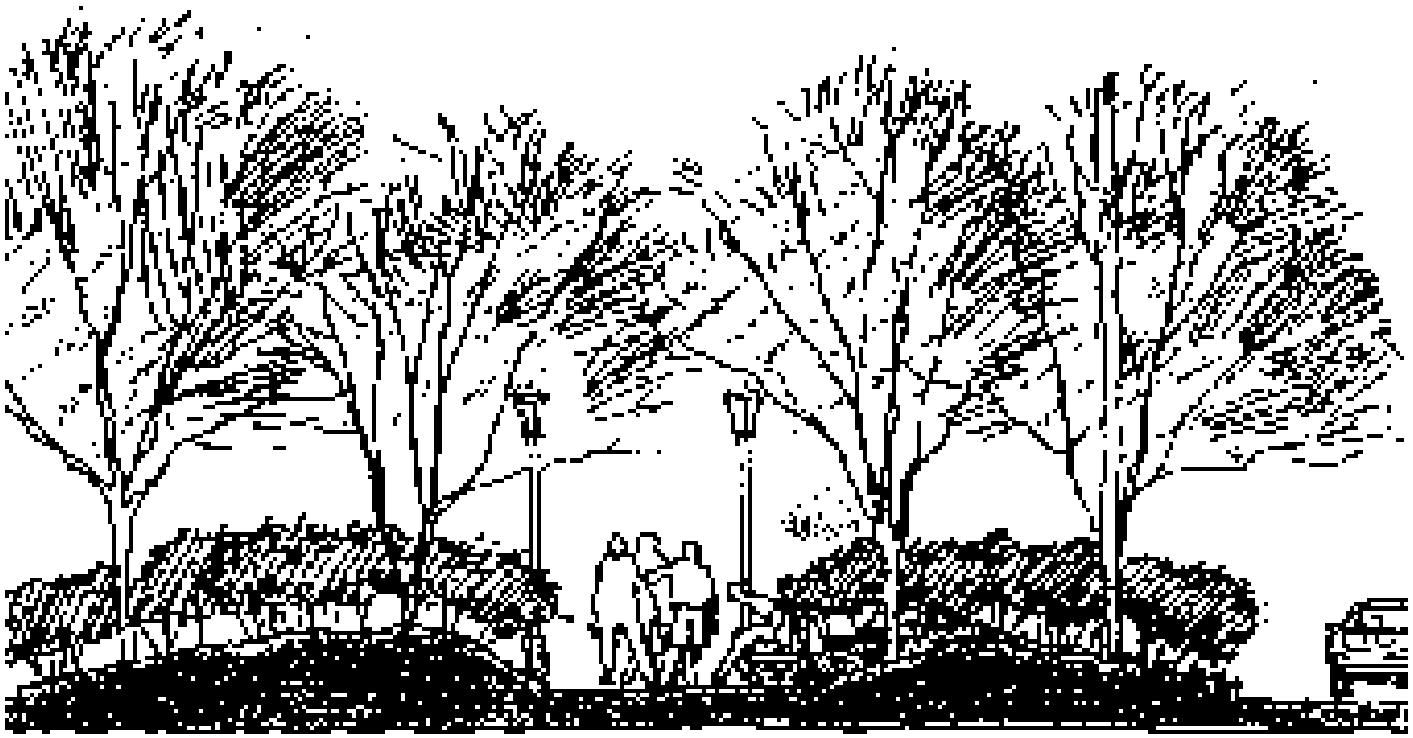
How to Use the Plant Matrix

The following PLANT MATRIX should be used in conjunction with a thorough investigation of the micro-climate of the specific planting project. This plant matrix should then be used as a guideline to developing a plant list for the specific project subject to review by the Post's horticulturalist. These are recommended species and do not necessarily preclude the selection of other species based on availability and cost or other factors.

The Plant Matrix is organized into plant categories of Trees (deciduous), Evergreen Trees, Ornamental Trees, Shrubs and Groundcovers. The applicable criteria checklist to the right of the species will tell the user the following information:

Type (Indigenous, Deciduous, Evergreen)
Visual Zone (appropriate application)
Application (how the plant can be used)
Exposure (degree of sun, shade)
Soil (tolerable plant medium)

The post horticulturalist or design professional may use this list as an initial guide, and apply other design criteria for selection and location on a planting plan. (See FL. 6-160)



FL. 6-160

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.3 Landscape 3.6

6.3.7 Plant Matrix

GW LT CC SS TF FH OS

(Page 1 of 7)

Botanical Name / Common Name	Type			Visual Zone							Appl.					Exp.			Soil		
	Deciduous	Evergreen	Indigenous	GW	LT	CC	SS	TF	FH	OS	Shade	Street Tree	Ornamental Interest	Screen	Erosion Control	Sun	Partial Shade	Shade	Dry	Moist	Adaptable
TREES																					
Acer ginnala Amur Maple	●				●	●		●	●				●			●	●				●
Acer palmatum Japanese Maple	●					●		●	●				●			●	●			●	
Acer platanoides Norway Maple	●				●	●		●	●		●	●				●					●
Acer rubrum Red Maple	●		●	●	●	●	●	●	●	●	●	●	●			●				●	
Cercidiphyllum japonicum Katsura Tree	●					●		●	●		●		●			●				●	
Fraxinus lanceolata Marshall's Seedless Ash	●			●	●		●	●			●	●				●	●				●
Gleditsia triacanthos inermis Thornless Honeylocust	●				●	●		●			●	●				●					●
Liquidamber styracifua Sweetgum	●		●	●	●	●	●	●	●		●					●	●				●
Liriodendron tulipifera Tulip Tree	●		●	●				●	●	●						●					●
Magnolia virginiana Sweetbay Magnolia		●		●	●	●	●	●	●				●			●					●
Magnolia grandiflora Southern Magnolia		●	●	●	●	●	●	●	●	●	●		●			●					●
Nyssa sylvatica Sourgum	●		●	●	●	●	●	●	●				●			●	●			●	●
Platanus acerifolia London Planetree	●			●	●	●	●	●	●	●	●	●	●			●				●	●

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.3 Landscape 3.6

6.3.7 Plant Matrix

GW LT CC SS TF FH OS
(Page 2 of 7)

Botanical Name / Common Name	Type			Visual Zone							Appl.					Exp.			Soil		
	Deciduous	Evergreen	Indigenous	GW	LT	CC	SS	TF	FH	OS	Shade	Street Tree	Ornamental Interest	Screen	Erosion Control	Sun	Partial Shade	Shade	Dry	Moist	Adaptable
Pyrus calleryana Callery Pear	●				●	●		●	●			●	●			●				●	●
Quercus borealis Red Oak	●		●	●	●	●		●	●	●	●	●				●			●		
Quercus darlingtoni Darlington Oak	●	●	●					●	●				●			●				●	●
Quercus palustris Pin Oak	●			●	●	●		●	●		●					●			●		●
Quercus phellos Willow Oak	●			●	●	●		●			●	●				●	●		●		●
Sophora japonica Jap. Scholartree	●				●	●		●			●	●				●					●
Tilia cordata Littleleaf Linden	●				●	●		●			●	●				●					●
Zelkova serrata Japanese Zelkova	●				●	●	●	●	●		●	●	●			●			●		●

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.3 Landscape 3.6

6.3.7 Plant Matrix

GW LT CC SS TF FH OS
(Page 3 of 7)

Botanical Name / Common Name	Type			Visual Zone							Appl.					Exp.			Soil		
	Deciduous	Evergreen	Indigenous	GW	LT	CC	SS	TF	FH	OS	Shade	Street Tree	Ornamental Interest	Screen	Erosion Control	Sun	Partial Shade	Shade	Dry	Moist	Adaptable
ORNAMENTAL TREES																					
Amelanchier canadensis Downy Shadblow	●		●		●			●	●	●			●				●	●	●		
Cornus kousa Kousa Dogwood	●			●	●	●		●	●	●			●				●				●
Cercis canadensis American Redbud	●		●	●				●	●	●			●				●				●
Cragaegus phaenopyrum Washington Hawthorn	●			●	●	●		●	●				●			●					●
Magnolia soulangeana Saucer Magnolia	●				●	●		●	●				●			●				●	
Magnolia stellata Star Magnolia	●				●			●	●								●			●	
Malus species Crabapple species	●			●	●	●	●	●	●				●			●			●		●
Oxydendrum arboreum Sourwood	●		●			●		●	●	●	●		●			●	●		●		●
Prunus serrulata kwanzan Kwanzan cherry	●					●	●	●					●			●				●	

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.3 Landscape 3.6

6.3.7 Plant Matrix

GW LT CC SS TF FH OS
(Page 4 of 7)

Botanical Name / Common Name	Type			Visual Zone							Appl.					Exp.			Soil		
	Deciduous	Evergreen	Indigenous	GW	LT	CC	SS	TF	FH	OS	Shade	Street Tree	Ornamental Interest	Screen	Erosion Control	Sun	Partial Shade	Shade	Dry	Moist	Adaptable
EVERGREEN TREES																					
Hex opaca American Holly		●	●	●	●	●		●	●				●	●		●			●		
Picea abies Norway Spruce		●		●	●	●		●	●				●	●		●			●		●
Pinus strobus White Pine		●		●	●	●	●	●	●	●				●		●			●		
Pinus thunbergii Jap. Black Pine		●			●	●		●	●					●		●					●
Pinus virginiana Virginia Pine		●	●				●	●		●			●	●		●			●		●

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.3 Landscape 3.6

6.3.7 Plant Matrix

GW LT CC SS TF FH OS
(Page 5 of 7)

Botanical Name / Common Name	Type			Visual Zone							Appl.					Exp.			Soil		
	Deciduous	Evergreen	Indigenous	GW	LT	CC	SS	TF	FH	OS	Shade	Street Tree	Ornamental Interest	Screen	Erosion Control	Sun	Partial Shade	Shade	Dry	Moist	Adaptable
SHRUBS																					
Abelia grandiflora Glossy Abelia		●			●	●	●	●	●				●		●	●	●	●			●
Azalea species Azalea species	●	●			●	●		●	●				●				●				●
Buxus sempervirens American Boxwood		●				●		●	●				●	●		●					●
Cornus stolonifera Yellowtwig Dogwood	●			●	●			●	●				●		●	●	●				●
Cotoneaster species Cotoneaster species		●			●	●		●	●				●		●	●			●		
Euonymous patens Upright Eurnymous		●			●	●	●	●	●				●		●	●					●
Ilex cornuta burfordi Dwarf Burford Holly		●			●	●		●	●				●		●	●	●				●
Ilex crenata Japanese Holly		●			●	●		●	●						●	●					●
Juniperus chinensis Juniper species		●			●	●	●	●	●	●			●	●	●	●			●		
Juniperus horizontalis Juniper					●	●	●	●	●				●		●	●			●		
Ligustrum obtusifolium Regal Privet					●			●	●				●				●				●
Myrica cerifera Southern Bayberry		●	●	●	●	●	●	●	●	●			●	●	●		●				●

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.3 Landscape 3.6

6.3.7 Plant Matrix

GW LT CC SS TF FH OS
(Page 6 of 7)

Botanical Name / Common Name	Type			Visual Zone							Appl.					Exp.			Soil		
	Deciduous	Evergreen	Indigenous	GW	LT	CC	SS	TF	FH	OS	Shade	Street Tree	Ornamental Interest	Screen	Erosion Control	Sun	Partial Shade	Shade	Dry	Moist	Adaptable
Syringa vulgaris Common Purple Lilac	●					●		●	●				●			●				●	
Taxus cuspidata Japanese Yew		●		●	●	●	●	●	●				●	●	●	●	●	●			●
Viburnum species Viburnum species	●	●	●	●	●	●	●	●	●	●			●	●	●	●	●	●			●

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.3 Landscape 3.6

6.3.7 Plant Matrix

GW LT CC SS TF FH OS
(Page 7 of 7)

Botanical Name / Common Name	Type			Visual Zone							Appl.					Exp.			Soil		
	Deciduous	Evergreen	Indigenous	GW	LT	CC	SS	TF	FH	OS	Shade	Street Tree	Ornamental Interest	Screen	Erosion Control	Sun	Partial Shade	Shade	Dry	Moist	Adaptable
GROUNDCOVERS																					
Ajuga reptans Ajuga		●			●	●		●	●				●		●	●	●	●			●
Euonymous radicans coloratus Wintercreeper		●			●	●	●	●	●				●		●	●	●				●
Hedera helix baltica English Ivy		●		●	●	●	●	●	●	●			●		●	●	●	●			●
Liriope Lilyturf		●		●	●	●		●	●				●		●	●	●	●			●
Pachysandra terminalis Japanese Spruge		●			●	●		●	●				●		●		●	●			●
Vinca minor Periwinkle		●			●	●		●	●				●		●		●	●			●

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6.3 Landscape 3.7

6.3.8 Paving Materials GW LT CC SS TF FH OS

(Page 1 of 2)

Paving Material	Application	GW	LT	CC	SS	TF	FH	OS	Installation/Finish
1. Brick Pavers	1.A. Ceremonial Plaza	●	●	●		●			1.A. & B. Recommended Pattern - - Running Bond for General Use Mortar Joints - - Heavy Pedestrian Use Concrete Base with Mortar or Bituminous Setting Bed - - Heavy Pedestrian Use/Vehicular Access
	1.B. Entrance Plazas/ Courtyards		●	●		●			
2. Concrete	2.A. Walkways - General Pedestrian Use	●	●	●	●	●	●	●	2.A. Broom finish or aggregate surface * (brown/tan aggregate) for non-slip finish, with smooth trowel edging within scoring.
	2.B. Service Areas/ Truck Dock	●	●	●	●	●	●	●	2.B. Use appropri-ate thickness for use. Light broom finish for nonslip surface.

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.3 Landscape 3.7

6.3.8 Paving Materials GW LT CC SS TF FH OS

(Page 2 of 2)

Paving Material	Application	GW	LT	CC	SS	TF	FH	OS	Installation/Finish
3. Unit Pavers	3. Entrance Plazas/ Courtyards	●	●	●		●			3. Prest concrete or asphalt pavers. Optional brick edging to match adjacent buildings.
4. Asphalt Pavement	4.A. Troop Movement Pathways & Spine	●	●	●	●	●	●	●	4A. Use a red or brown colored aggregate in mix to differentiate from pedestrian and roadway pavements
	4.B. Roadways/ Service Areas	●	●	●	●	●	●	●	4.B. Use the appropriate thickness for heavy vehicles.
	4.C. Bikeways	●	●	●	●	●	●	●	4.C. Use a light colored aggregate in mix to differentiate from roadway pavement.
	4.D. Sidewalks in Training and Recreational Areas	●	●	●	●	●	●	●	4.D. See 4A.

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Design Criteria Section

4 Site Furnishings

6.4 Site Furnishings 4.0

6.4.1 Site Furnishings Matrix GW LT CC SS TF FH OS

(Page 1 of 3)

The following matrix is a summary of the site furnishings to be used on post within the appropriate visual zones. Refer to DC 4.1.1 to 4.1.11 for specific manufacturers, and to pages 4.2.1 to 4.2.8 for specific applications. The three columns contain the following information: Item (general description), Visual Zone (which visual zones each furnishing is used within) Application (specific application within visual zone). Though there may be exceptions to application and visual zone, the matrix may be used as a general guide, followed by more detailed information on selection and location in each particular application.

Item	Visual Zone							Application
	GW	LT	CC	SS	TF	FH	OS	
1. Benches/Tables								
A. Wood Curvilinear Form with Metal Supports	●	●	●		●	●	●	1A. General use throughout,especially in areas of public use
B. Backless Wood Bench, Metal Supports		●		●	●			1B. Other less visible areas, especially in training areas
C. Picnic Table						●	●	1C. Recreational areas
2. Bollards								
A. Steel Pipe with Steel Ball and Cap, Black	●	●	●		●			2A. Highly visible areas throughout post
B. Wood					●	●	●	2B. Recreational and housing areas
C. Conc. Filled Pipe, Ptd. Black	●	●	●	●	●	●	●	2C. Service areas and less visible areas

6.4 Site Furnishings 4.0

6.4.1 Site Furnishings Matrix

GW LT CC SS TF FH OS
(Page 2 of 3)

Item	Visual Zone							Application
	GW	LT	CC	SS	TF	FH	OS	
3. Trash Receptacles								
A. Metal Receptacle, Formal Design		●	●		●			3A. Areas of high visibility
B. Metal Receptacle, Utilitarian Design	●	●	●	●	●	●	●	3B. General use - - near seating areas
4. Fences								
A. Metal Picket	●	●	●		●			4A. High visibility areas requiring security
B. Wood Screen	●	●	●		●	●	●	4B. General screening
C. Chain Link - Black Vinyl	●			●	●		●	4C. High security in areas of low visibility
D. Sidewalk Railing		●						4D. As required
5. Phone Booths								
A. Extruded Aluminum Kiosk	●	●	●		●			5A. Areas of high public use
6. Bus Shelters								
A. Rectangular Aluminum Frame with Wood Seat	●	●	●	●	●	●	●	6A. As required
7. Flagpole								
A. Standard Pole	●	●	●	●	●	●	●	7A. Key ceremonial areas, as required
B. Pennant Holder		●						7B. As required

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.4 Site Furnishings 4.0

6.4.1 Site Furnishings Matrix

GW LT CC SS TF FH OS
(Page 3 of 3)

Item	Visual Zone							Application
	GW	LT	CC	SS	TF	FH	OS	
8. Drinking Fountain								
A. Standard Iron/Steel Fountain	●	●	●		●		●	8A. Areas of high use & visibility
B. Handicap Pedestal-mounted Fountain		●	●					8B. As required near seating
9. Bicycle Racks								
A. Simple Ribbon Rack - Black	●	●	●	●	●	●	●	9A. Locate at building entries out of main circulation patterns

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6.4 Site Furnishings 4.1.0

6.4.2 Furnishing Selection GW LT CC SS TF FH OS

General Notes

The following descriptions (DC 4.1.1 to 4.1.12) identify each furnishing to be used within each visual zone. Though it is not required that the specific manufacturer be used, if substitutions are made the furnishings selected should match the specifications of the model shown as closely as possible. (See FL. 6-161)

The Section is arranged in the following way:

Item: (Generic description of furnishing to be used)

Material: (of the major components)

Color: (of the major components)

Form/Style: (General Description)

Application: (General location and specific visual zones)

AsManufactured by or Equal to: (Selected Manufacturer or first choice of manufacturers)

Model No.: (Most current model number available at the time of the brochure printing)

FL. 6-161

6.4 Site Furnishings 4.1.1

6.4.2 Furnishing Selection GW LT CC SS TF FH OS

Benches/Tables

Contour Bench (See FL. 6-162)

1A. Contour Bench

Material: Wood seat and back with metal supports

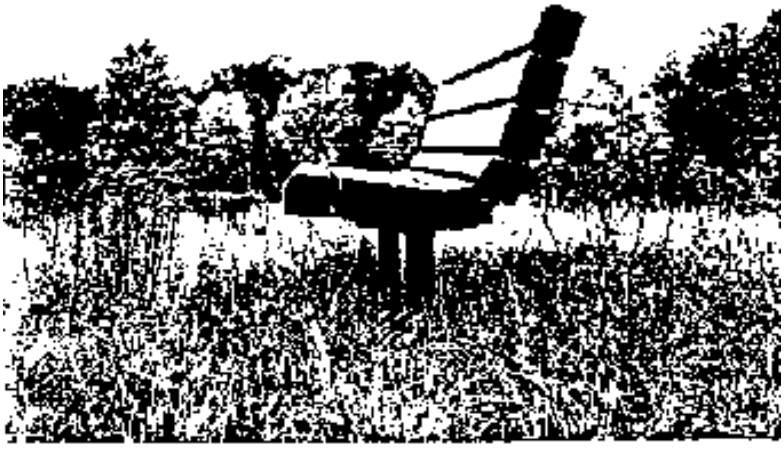
Color: Natural wood color, black metal parts

Application: General use in public areas throughout post. Zones: GW, LT, CC, FH, OS, SS, TF

AsManufactured by or Equal to:

Landscape Forms/LfI
431 Lawndale
Kalamazoo, Michigan
49001
800-521-2546

Model No.: Timberline 3.13 (Redwood or Red Oak) 313PE2572 POE: Support (Square, tubular embedded)



1.A Contour Bench

FL. 6-162
Contour Bench

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6.4.2 Furnishing Selection

LT CC SS TF FH OS
(See Site Furnishings Matrix)

Backless Wood Bench (See FL. 6-163)

1B. Backless Wood Bench

Material: Wood seat, metal pedestal

Color: Natural wood color, black metal

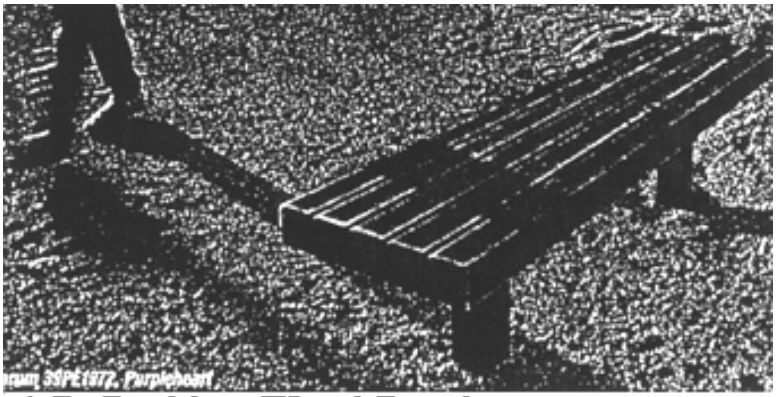
Form/Style: Simple, wood slat seat with embedded pedestal

Application: Zones: LT, SS, TF

AsManufactured by or Equal to:

Landscape Forms/LFI
431 Lawndale
Kalamazoo, Michigan
49001
800-521-2546

Model No.: Forum 39 PE 1972 Redwood, PDE Support (square tubular embedded)



FL. 6-163
Backless Wood Bench

Picnic Table (See FL. 6-164)

1C. Picnic Table

Material: Pressure-treated wood top and seats, galvanized pipe supports

Color: Natural wood color galvanized pipes to have black finish.

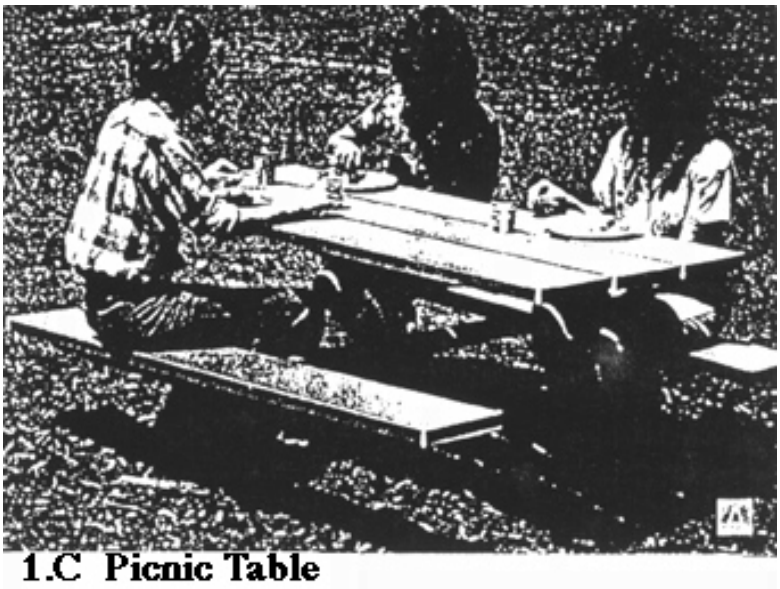
Form/Style: Two seats per table, single pedestal

Application: Zones: FH, OS

AsManufactured by or Equal to:

Gametime
P.O. Box 121
Fort Payne
Alabama 35967
205-845-5610

Model No.: No. 795, 6ft. Single Post Picnic Table



FL. 6-164
Picnic Table

6.4.2 Furnishing Selection

GW LT CC SS TF FH OS
(See Site Furnishings Matrix)

Metal Bollard (See FL. 6-165)

2A. Metal Bollard

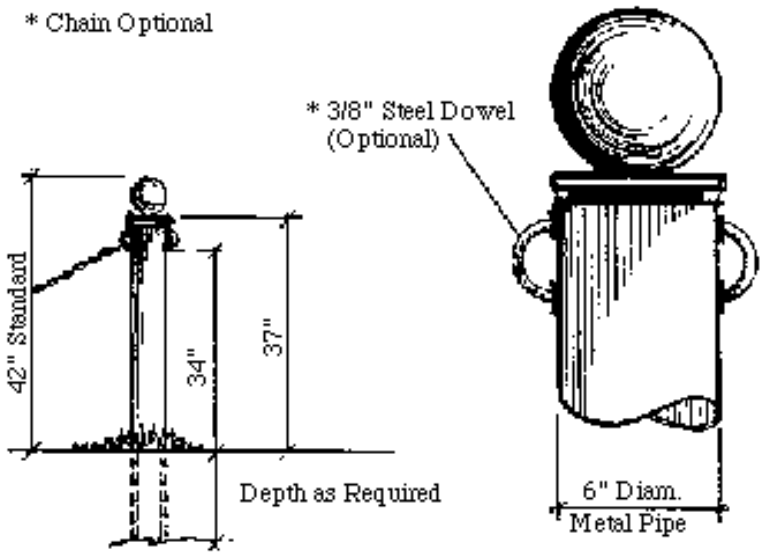
Material: Steel Pipe with Steel Ball & Cap

Color: Black

Form/Style: Traditional pipe with ball

Application: General use for any area requiring circulation control. Zones: GW, LT, CC, TF ball

AsManufactured by or Equal to: Make and install on Post 3 Ft. Ht., 6-8" Dia.



2A Metal Bollard

FL. 6-165
Metal Bollard

Wood Bollard(See FL. 6-166)

2B. Wood Bollard

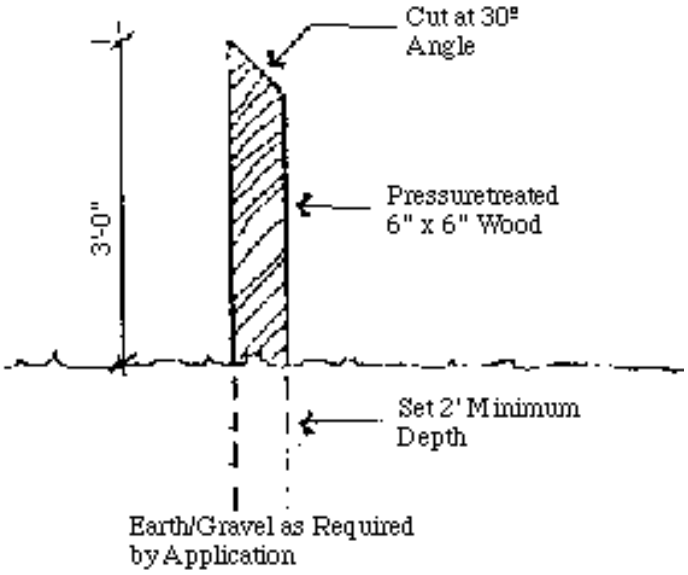
Material: Wood

Color: Natural Pressure-treated

Form/Style: 6" x 6" square wood, cut top on 30 degree angle

Application: Recreational Areas, training areas, family housing areas vehicular circulation control Zones: TF, FH, OS

AsManufactured by or Equal to: Make and install on Post.



2B Wood Bollard

FL. 6-166
Wood Bollard

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.4 Site Furnishings 4.1.4

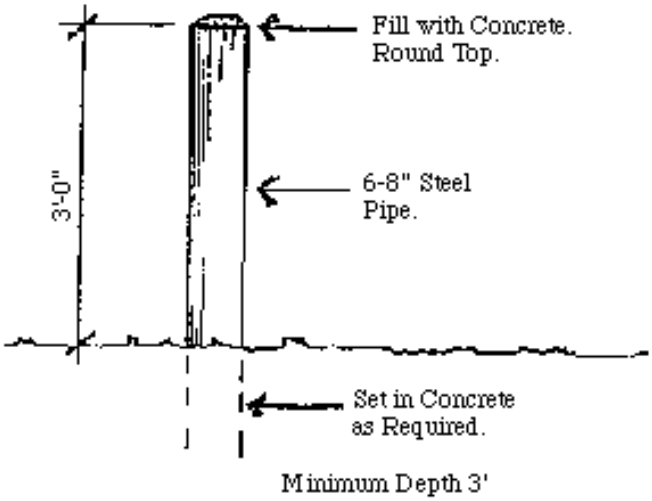
6.4.2 Furnishing Selection

GW LT CC SS TF FH OS
(See Site Furnishings

Matrix)

Concrete-filled Pipe Bollard
(See FL. 6-167)

2C.	Concrete Filled Pipe Bollard
Material:	Galvanized steel pipe filled with concrete with convex top
Color:	Black colored finish
Form/Style:	Simple cylinder
Application:	Service areas, protection of building walls, corners, where required in less visible areas.
AsManufactured by or Equal to:	Make and install on post--3 ft. ht., 6-8inch dia.



2.C Concrete-filled Pipe Bollard

FL. 6-167
Concrete-filled Pipe Bollard

6.4 Site Furnishings 4.1.5

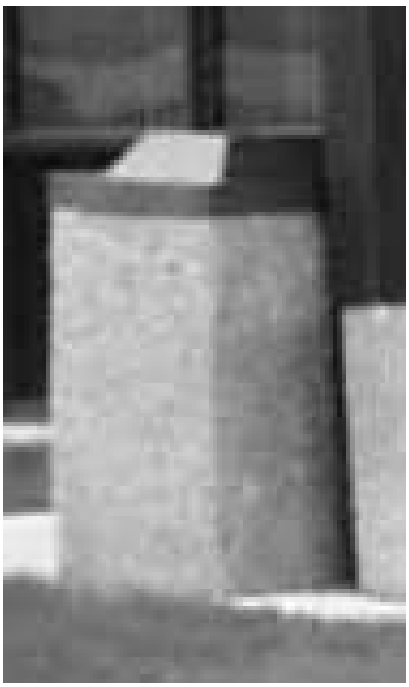
6.4.2 Furnishing Selection

GW LT CC SS TF FH OS
(See Site Furnishings Matrix)

Trash Receptacles

Metal Receptacle (See FL. 6-168)

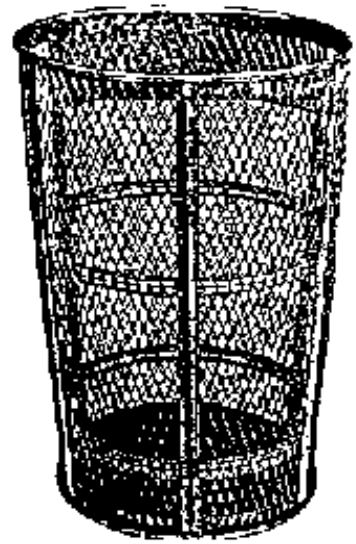
3A.	Metal Receptacle
Material:	Reinforced (concrete) exposed aggregate with linear low density high impact resistant polyethylene liner and lid with receptacle hole in it
Color:	Natural
Form/Style:	Square
Application:	High visibility areas within public use zones Zones: LT, CC, TF
AsManufactured by or Equal to:	The BEST Litter Receptacles, Inc.
Model No.:	Various models/sizes



FL. 6-168
Metal Receptacle

Metal Mesh Receptacle (See FL. 6-169)

3B.	Metal Trash Receptacle
Material:	Heavy gauge, hot-dipped galvanized steel
Color:	Black painted finish
Form/Style:	Tapered, utilitarian design
Application:	General use throughout post Zones: GW, LT, CC, SS, TF, FH, OS
AsManufactured by or Equal to:	United Metal Receptacle Corp. 14th & Laurel Street Pottsville, PA 17901 717-622-7715
Model No.:	SBR 52 32 Inch Ht., 24 Inch Dia.



3.B Metal Mesh Receptacle

FL. 6-169
Metal Mesh Receptacle

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.4.2 Furnishing Selection

GW LT CC SS TF FH OS
(See Site Furnishings Matrix)

Fencing/Railings

Steel Picket Fence(See FL. 6-170)

3A. Metal Picket Fence

Material: Tubular Steel

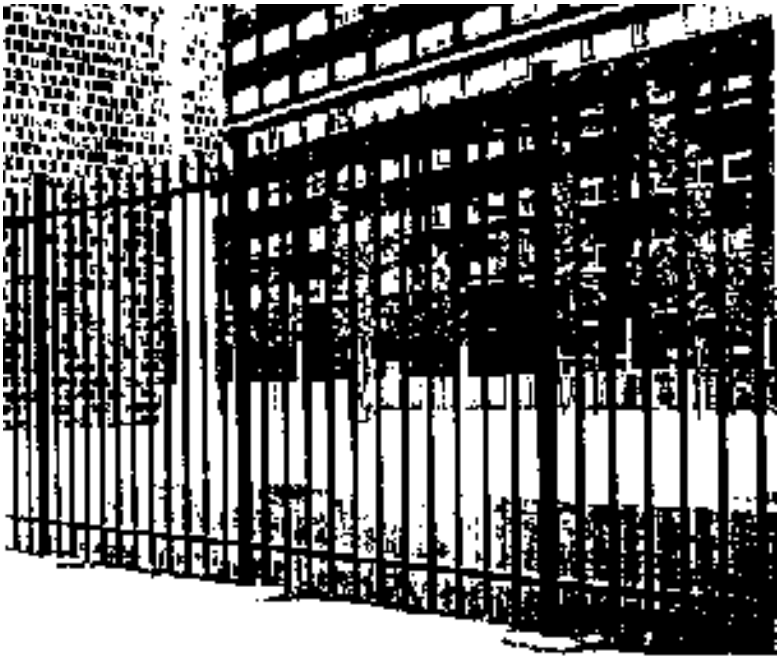
Color: Black finish

Form/Style: Traditional Picket

Application: Areas of high visibility within public use zones
Zones: GW, LT, CC, TF

AsManufactured by or Equal to:
Westmoreland Tubular Products Mfg. Co.
Bristol, PA
215-949-3100

Model No.: Barrier Traditional



4.A Steel Picket Fence

FL. 6-170
Steel Picket Fence

Wood Fence(See FL. 6-171)

4B. Wood Fence

Material: Wood

Color: Natural

Form/Style: Traditional Post, Board, Rail pattern

Application: Screening or area definition in Headquarters and Residential areas
Zones: GW, LT, CC, FH, OS

AsManufactured by or Equal to:
Walpole Woodworkers
767 East Street
Walpole, MA 02081
616-668-2800

Model No.: The 'Universal' Fence
4, 5, 6, or 8 ft. ht.

4.B Wood Fence

FL. 6-171
Wood Fence

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.4 Site Furnishings 4.1.7

6.4.2 Furnishing Selection GW LT CC SS TF FH OS

Fencing/Railings

Chain Link Fence (See FL. 6-172)

4C. Chain Link Fence

Material: Galvanized mesh with vinyl coating

Color: Black vinyl coat

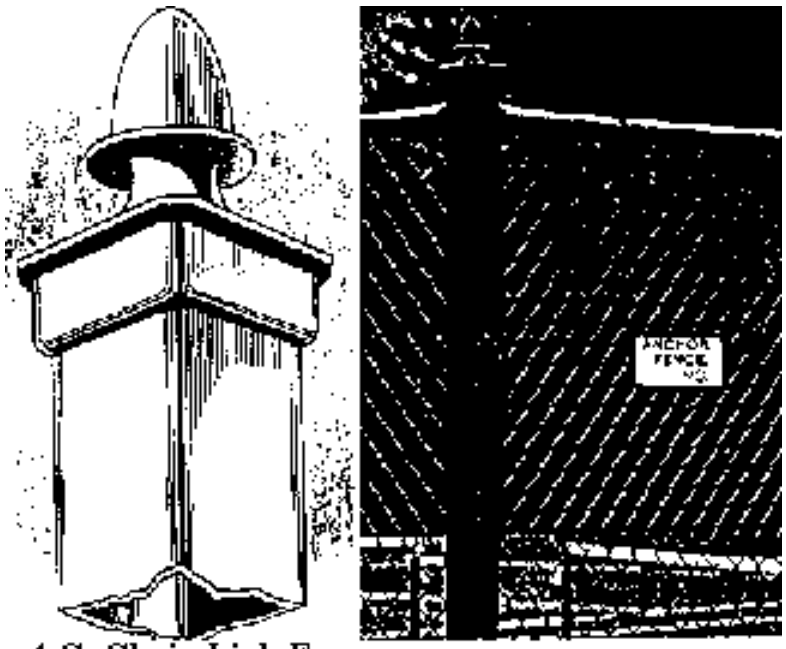
Form/Style: Posts and rails as required, with square terminal post tops

Application: High security in areas of low visibility wherever needed

AsManufactured by or Equal to:

Anchor Fence Co.
6500 Eastern Ave.
Baltimore,
Maryland 21224
301-633-6500

Model No.: As required for application with PVC vinyl and square terminal posts



4.C Chain Link Fence

FL. 6-172
Chain Link Fence

Sidewalk Railing (See FL. 6-173)

4D. Sidewalk Railing

Material: Steel Pipe Rail, 2" Dia., 4" x 4" Wood Posts

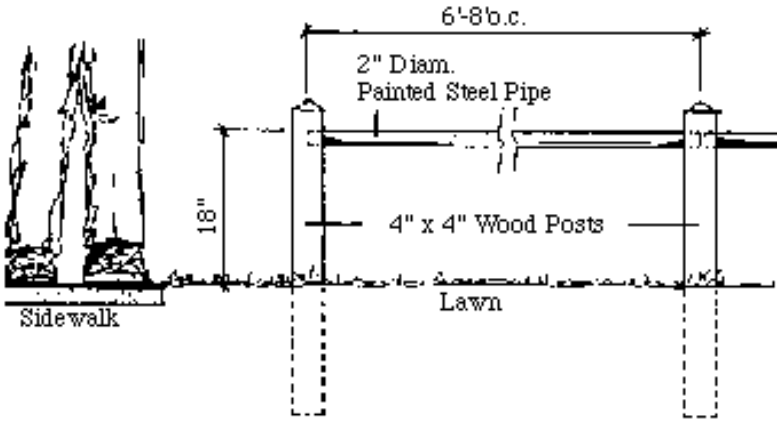
Color: Dark Terra Cotta, Pipe Only

Form/Style: As illustrated

Application: Edges of and at Intersections of Sidewalks (To Prevent Shortcuts across lawns where High Pedestrian Traffic Occurs)

AsManufactured by or Equal to:

Make and install on Post



4.D Sidewalk Railing

FL. 6-173
Sidewalk Railing

6.4.2 Furnishing Selection

GW LT CC SS TF FH OS
(See Site Furnishings Matrix)

Phone Booth (See FL. 6-174)

5A. Kiosk Phone Booth

Material: Cast Aluminum

Color: Black finish

Form/Style: Cylinder

Application: Use only in high volume pedestrian areas.
Zones: GW, LT, CC, TF

AsManufactured by or Equal to:
King Products Ltd.
3150 Wharton Way
Mississauga, Ont.
Canada L4X 2C1
416-625-1111

Model No.: 540, Telephone Kiosk

5.A Phone Booth

FL. 6-174
Phone Booth

Bus Shelter (See FL. 6-175)

6A. Bus Shelter with Bench

Material: Aluminum structure with wood bench

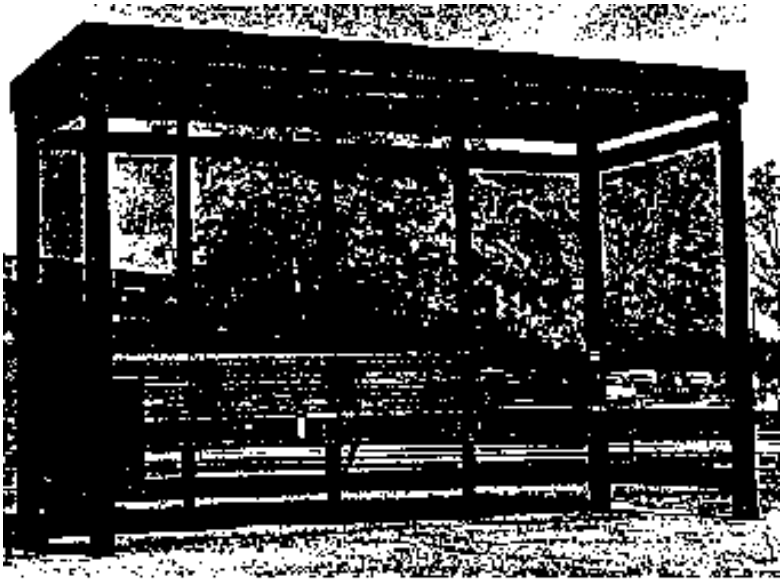
Color: Aluminum to have black finish, bench to be natural wood color

Form/Style: Simple rectangular shape with flat roof

Application: Throughout post as required

AsManufactured by or Equal to:
Michigan Industrial Co.
5505 36th Street
Grand Rapids,
Michigan 49508
616-949-1900

Model No.: 'Manatee Shelter'



6.A Bus Shelter

FL. 6-175
Bus Shelter

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.4 Site Furnishings 4.1.9

6.4.2 Furnishing Selection GW LT CC SS TF FH OS

Flagpole

Flagpole (See FL. 6-176)

7A. Steel Flagpole

Material: Stainless steel pole

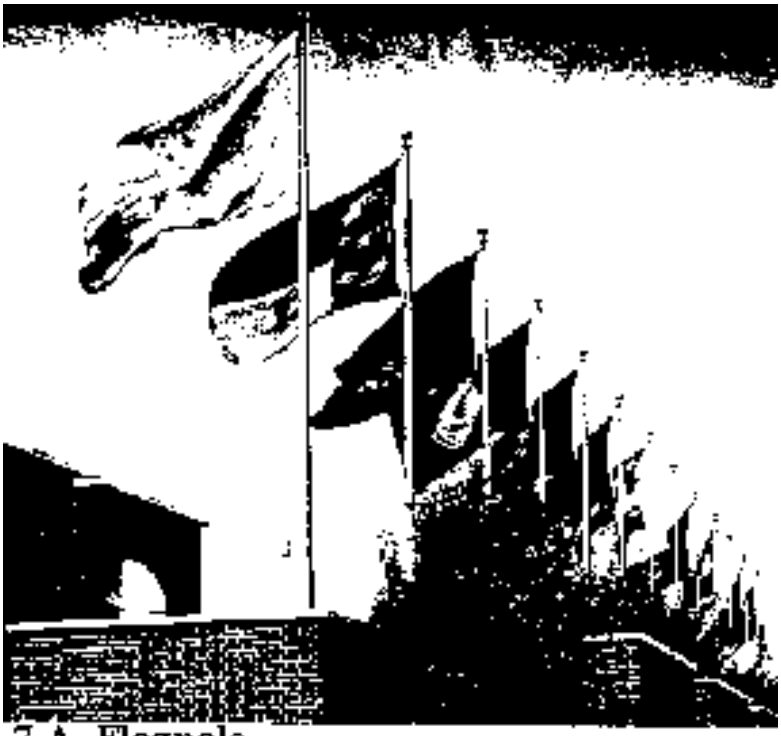
Color: Clear finish, satin rubbed finish

Application: Key ceremonial and activity areas

AsManufactured by or Equal to:

Acme Flagpole Co.
Lingo, Inc.
Box 1237, 28th St.
Camden NJ 08105
609-964-0487

Model No.: As required with:
* Standard foundation
* Flagclasp with thermoplastic finish
* Ball on pole top
* Polished finish #4



7.A Flagpole

FL. 6-176
Flagpole

Pennant Holder (See FL. 6-177)

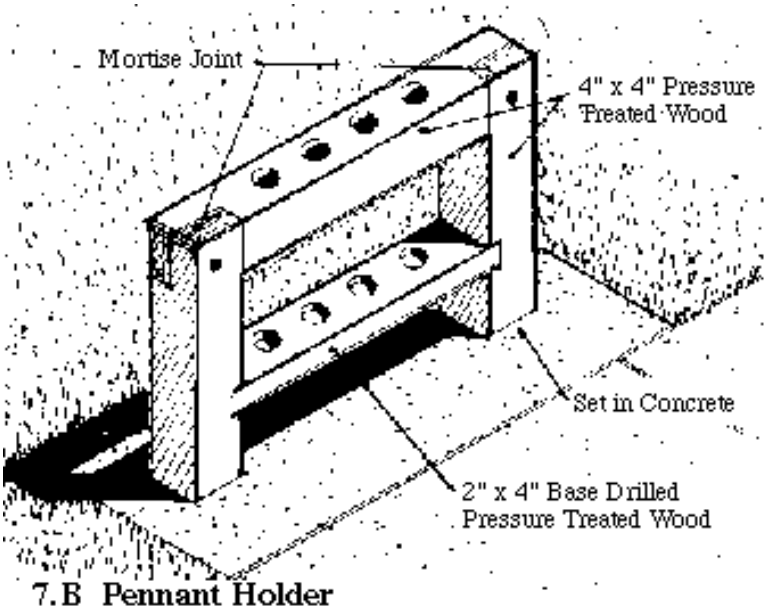
7B. Pennant Holder

Material: Pressure-treated Wood, 4” x 4” posts

Application: Entrances to Barracks and other buildings used by trainees, LT Zone.

AsManufactured by or Equal to:

Fabricated on Post



FL. 6-177
Pennant Holder

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.4.2 Furnishing Selection

GW LT CC SS TF FH OS
(See Site Furnishings Matrix)

Drinking Fountains

Drinking Fountain (See FL. 6-178)

8A. Drinking Fountain

Material: Cast-iron base, steel standard, chrome-plated bronze bowl, bubbler, and mouthguard

Color: Black finish

Form/Style: Octagonal base and bowl.

Application: General use as required in pedestrian areas.
Zones: GW, LT, CC, TF, OS

AsManufactured by or Equal to:
Murdock, Inc.
2488 River Road
Cincinnati, Ohio 45204
513-471-7700

Model No.: M-30
Economy
Anti-freezing

8.A Drinking Fountain

FL. 6-178
Drinking Fountain

Handicap Drinking Fountain (See FL. 6-179)

8B. Drinking Fountain for Handicapped Use

Material: Cast aluminum

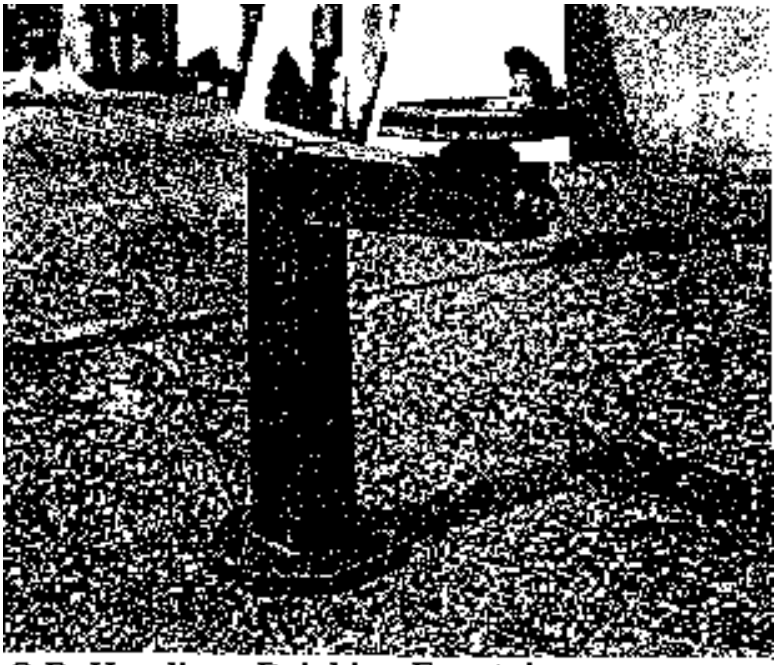
Color: Black finish

Form/Style: Octagonal base; handicap-accessible

Application: As required

AsManufactured by or Equal to:
Murdock, Inc.
2488 River Road
Cincinnati, Ohio 45204
513-471-7700

Model No.: M-43 HOAF
Pedestal Mount Anti-freezing



8.B Handicap Drinking Fountain

FL. 6-179
Handicap Drinking Fountain

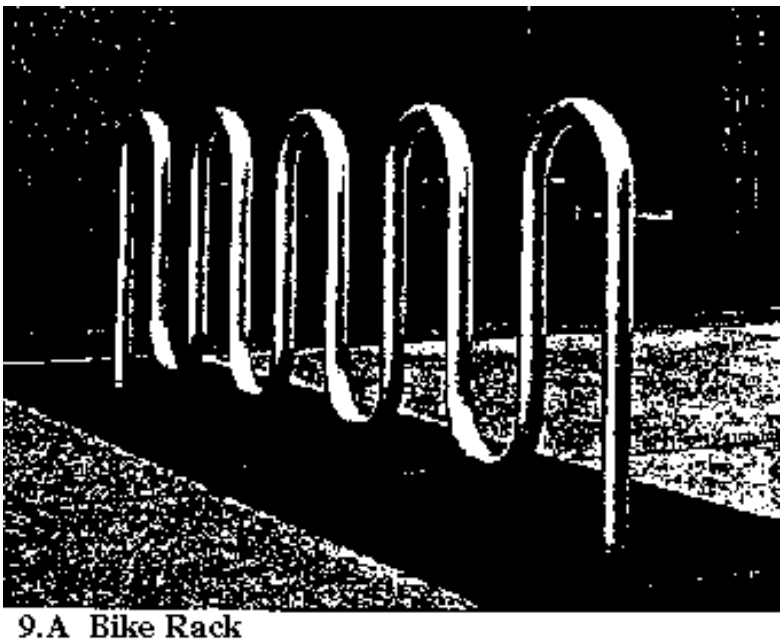
6.4 Site Furnishings 4.1.11

6.4.2 Furnishing Selection GW LT CC SS TF FH OS

Bike Rack

Bike Rack (See FL. 6-180)

9A.	Ribbon-shaped Bike Rack
Material:	Welded seamless pipe
Color:	Black finish
Form/Style:	Sinuous curved rack, embedded below grade
Application:	At building entries out of main circulation areas
AsManufactured by or Equal to:	Bike Security Racks Space Lattice Co. P.O. Box 371 Cambridge, MA 02140 617-547-5755
Model No.:	"Bike Stanchion" BS-B3 Mounted Below-Grade



9.A Bike Rack

FL. 6-180
Bike Rack

6.4 Site Furnishings 4.2.1

6.4.3 Site Furnishings Relationships GW LT CC SS TF

Bench/Sidewalk

Relationship of Bench and Sidewalk

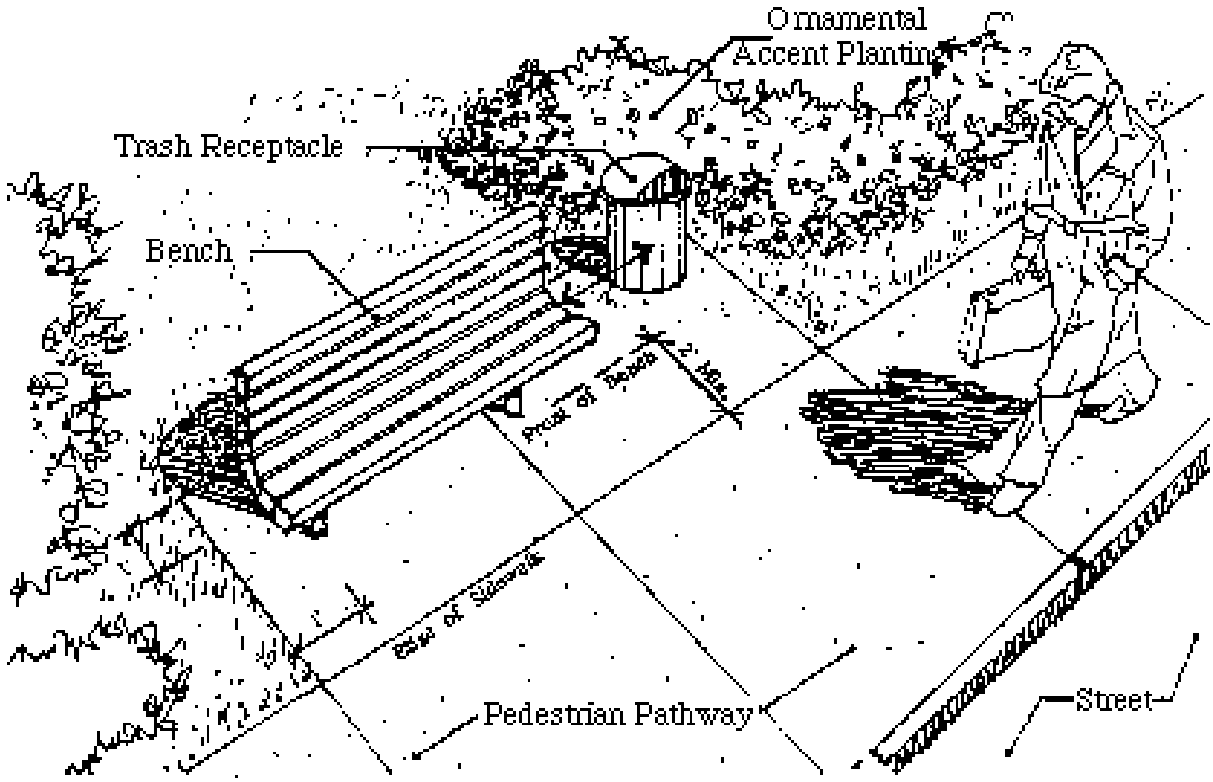
* The simplest of relationships between site furnishings and site conditions is illustrated here. (See FL. 6-181)

* Benches in the appropriate style should be located in areas of active pedestrian use.

* A bench should be incorporated with a trash receptacle in the appropriate style.

* Paving should extend a minimum of 1' beyond the end and back of bench.

* Bench should face walkway activity area.



FL. 6-181 Conceptual Relationship of Bench and Walkway

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.4 Site Furnishings 4.2.2

6.4.3 Site Furnishings Relationships GW LT CC SS TF FH

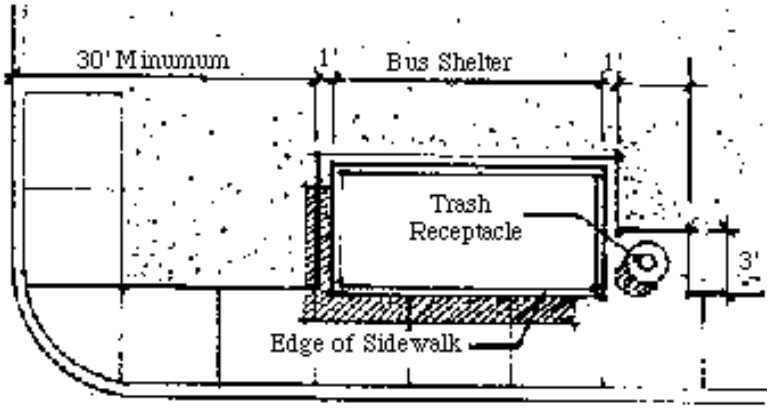
Bus Shelters

Location

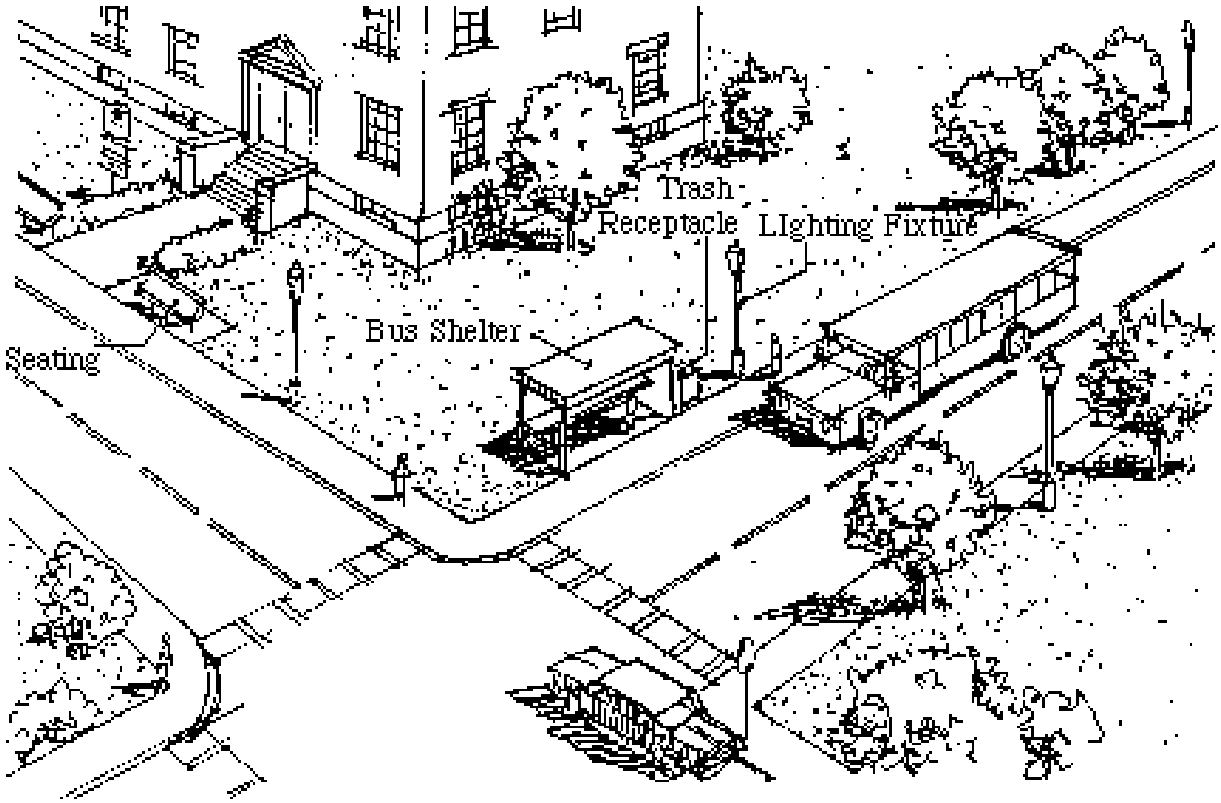
* Bus shelters should be located in as few locations as possible, only v where the heaviest demand exists.

* The shelter should be a minimum of 30' from the corner in order to not obstruct the view of on-coming traffic and not interfere with pedestrian movement on the sidewalk. (See FL. 6-182)

* Trash receptacles and lighting fixtures should be located in proximity to bus shelter.(See FL. 6-183)



FL. 6-182
Conceptual Plan of Bus Shelter



FL. 6-183 Conceptual Relationship of Bus Shelter, Street, and Site Furnishings

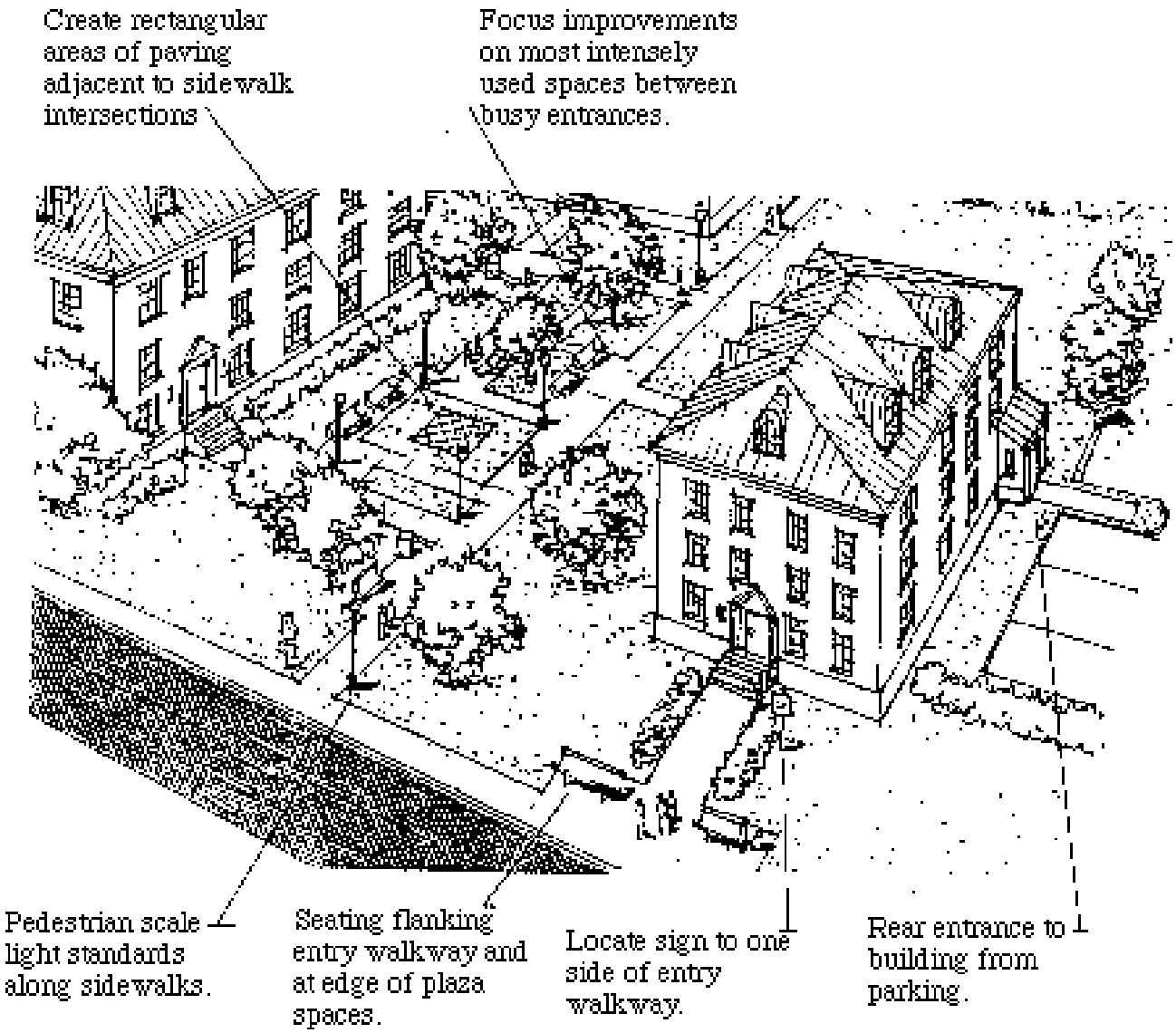
☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.4 Site Furnishings 4.2.3

6.4.3 Site Furnishings Relationships LT CC TF

Buildings/Open Space

Small plaza areas are important where administration buildings are clustered. These are the places people use enroute to different offices. They serve as informal meeting places and unify the complex of buildings. (See FL. 6-184)



FL. 6-184 Conceptual Relationship of Site Furnishings and Building Open Spaces

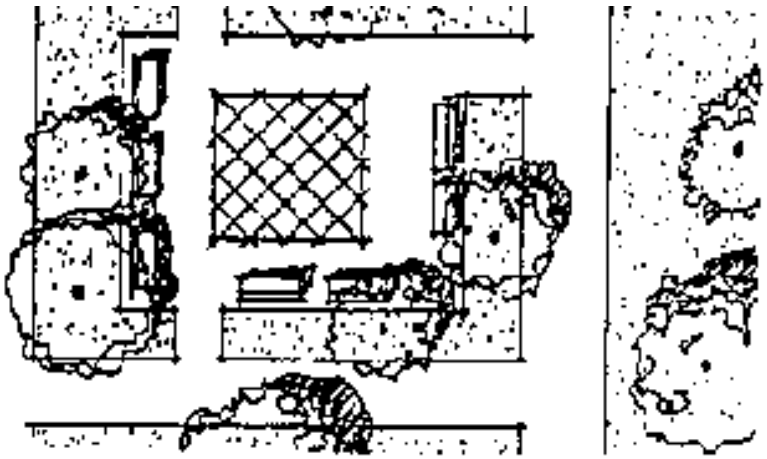
☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.4 Site Furnishings 4.2.4

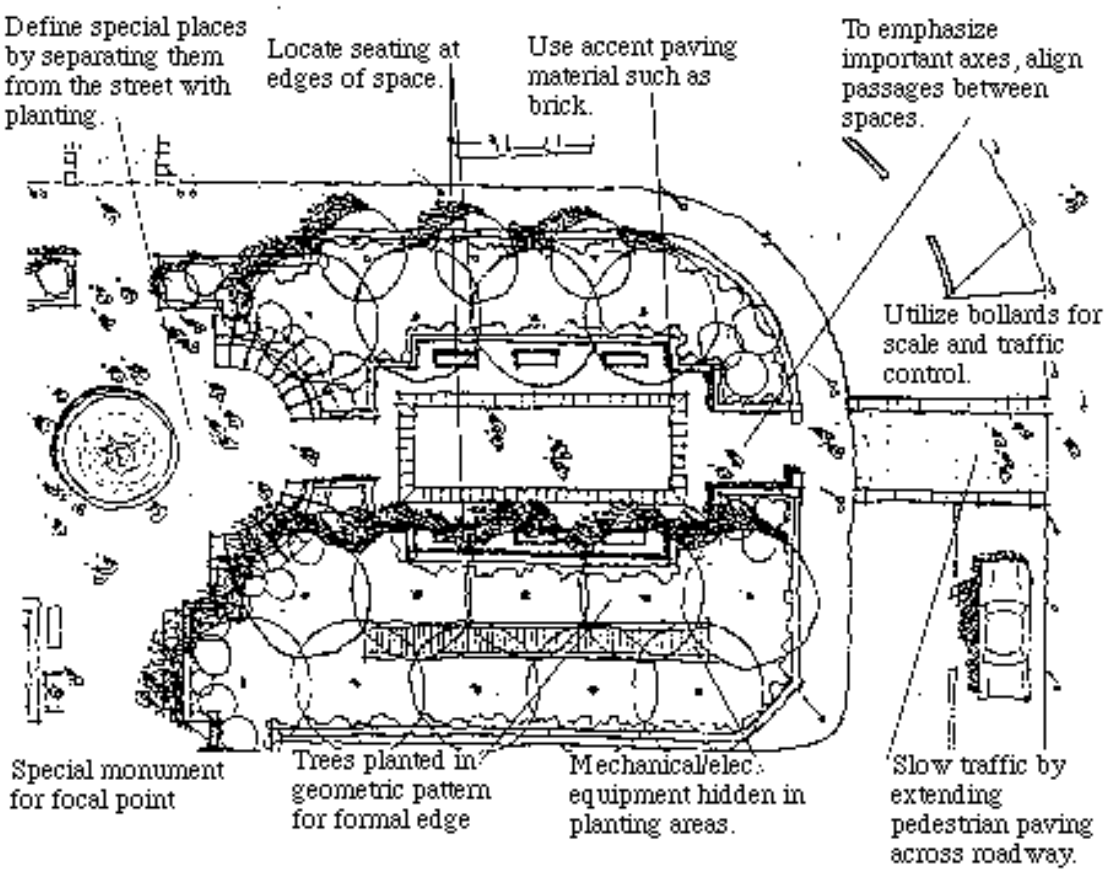
6.4.3 Site Furnishings Relationships LT CC TF

Plaza Courtyards

Create a small defined "outdoor room" by forming a rectangular area of paving, using accent materials, such as brick with concrete.(See FL. 6-185 and FL. 6-186)



FL. 6-185
Conceptual Plan for Outdoor Room



FL. 6-186 Conceptual Plan for Prototypical Plaza/Formal Open Space

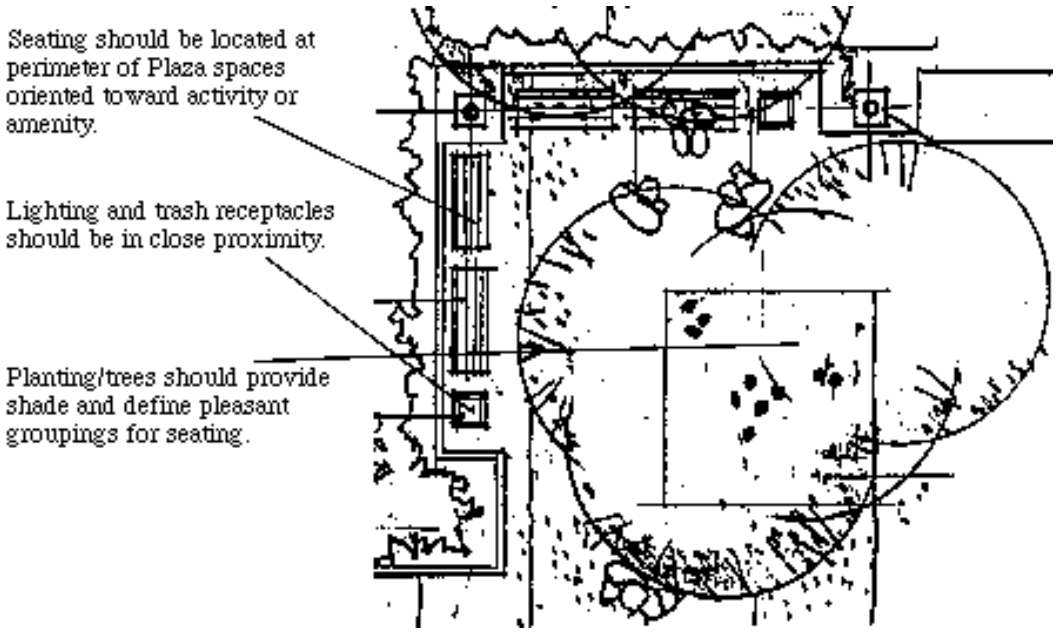
☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.4 Site Furnishings 4.2.5

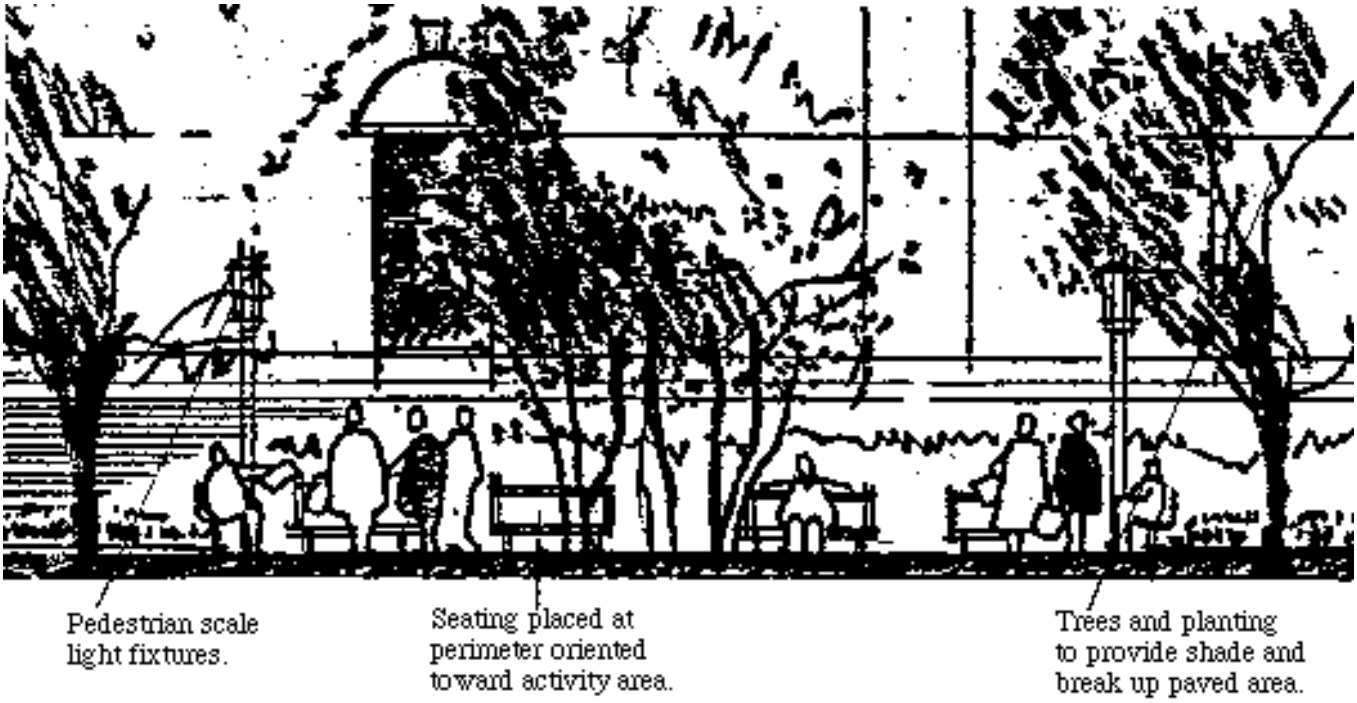
6.4.3 Site Furnishings Relationships LT CC TF

Seating in Plazas/Courtyards

Relationship of Seating/ Site Furnishings (See FL. 6-187 and FL. 6-188)



FL. 6-187



FL. 6-188

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.4 Site Furnishings 4.2.6

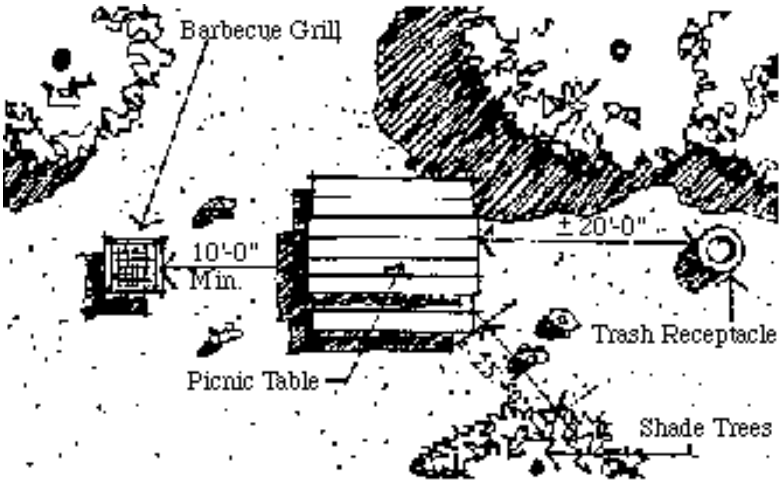
6.4.3 Site Furnishings Relationships FH OS

Recreation/Picnic Areas

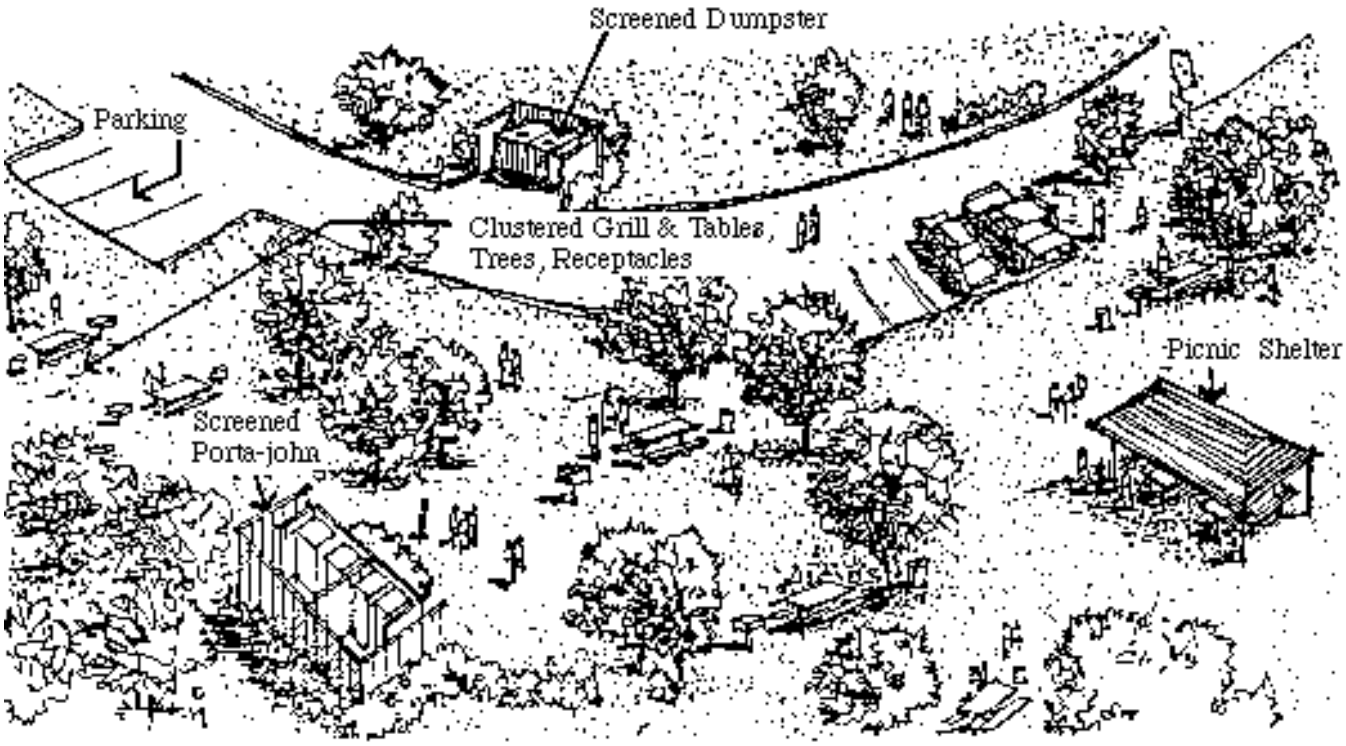
Site Furnishing should be grouped together to form clusters of activity in the open space, rather than randomly scattered in the OS Zone.

* Picnic tables should be placed close to trees for shade, but not underneath the tree. Grills and trash receptacles should not be too close. (See FL. 6-189)

* The relationship of active recreational uses and facilities must be carefully planned and related to the natural elements in the landscape, especially shade trees. (See FL. 6-190)



FL. 6-189
Relationship of Picnic Furnishings.



FL. 6-190 Conceptual Relationship of Site Furnishings-Recreation Areas

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.4 Site Furnishings 4.2.7

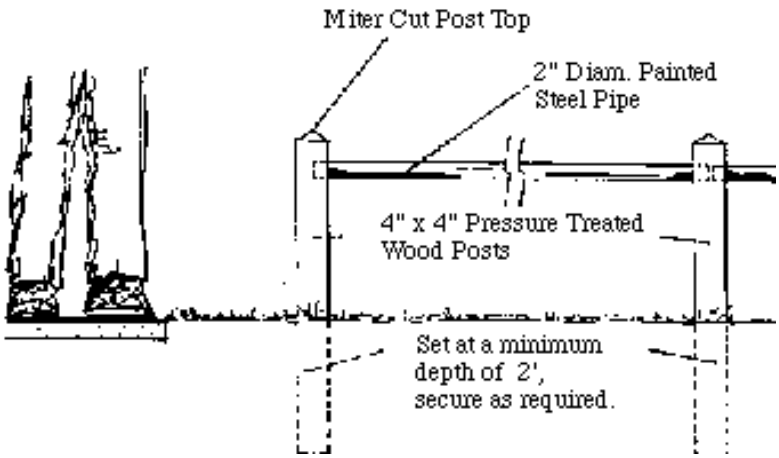
6.4.3 Site Furnishings Relationships LT

Lawn Barrier Rail

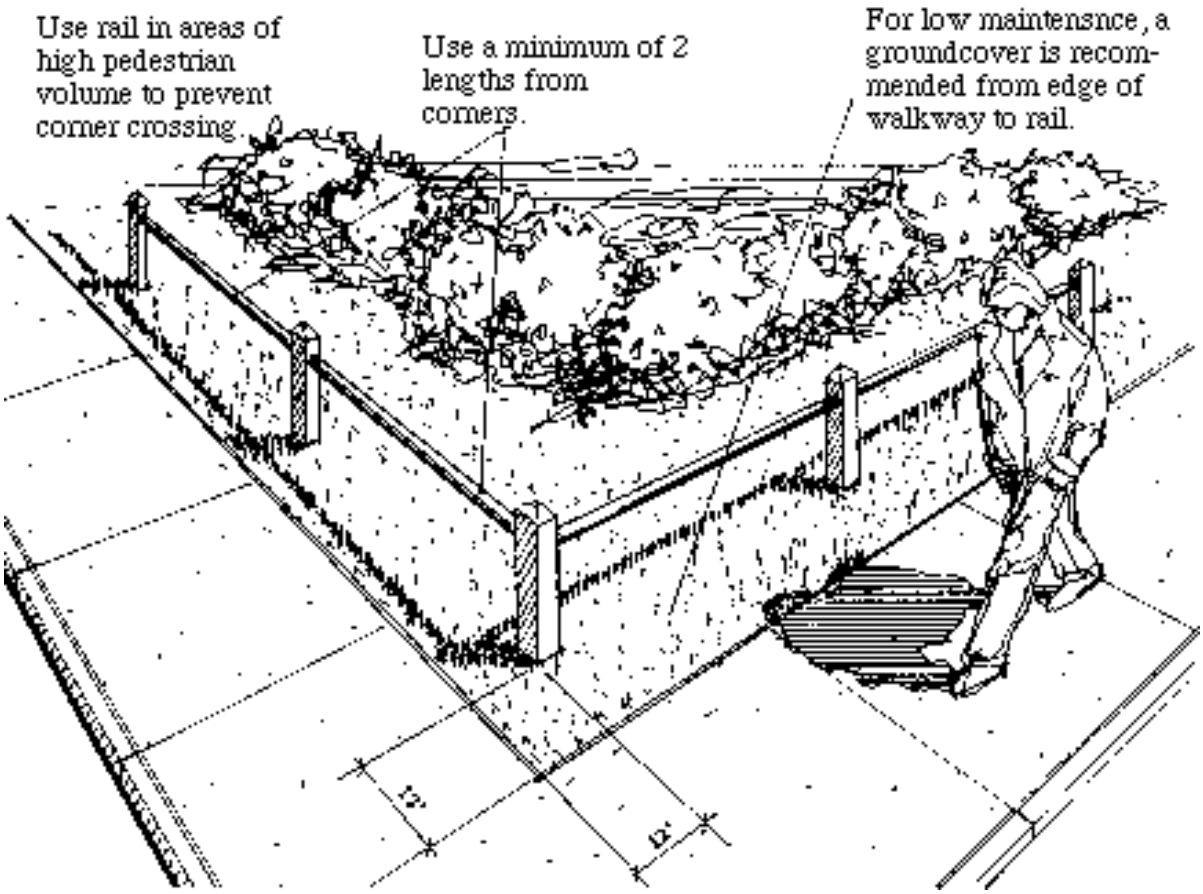
To discourage footpaths across lawn areas, use lengths of a low pipe rail along edge of sidewalk.

* Locate rail 18" high, 12" back from edge of sidewalk. Use 2" diam. steel pipe painted Brown.
  (See FL. 6-192)

* Locate vertical supports 6' to 8' apart. Use 4' x 4' pressure treated wood. Secure as required
  (See FL. 6-191)



FL. 6-191



FL. 6-192

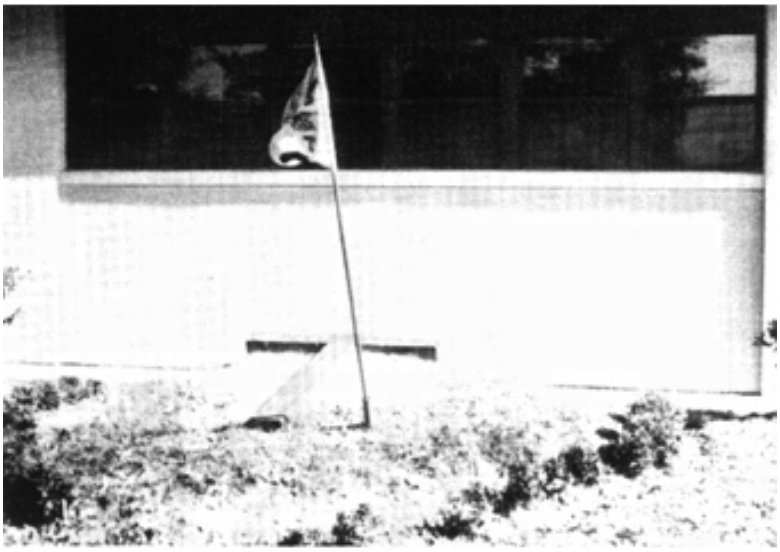
☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.4 Site Furnishings 4.2.8

6.4.3 Site Furnishings Relationships LT

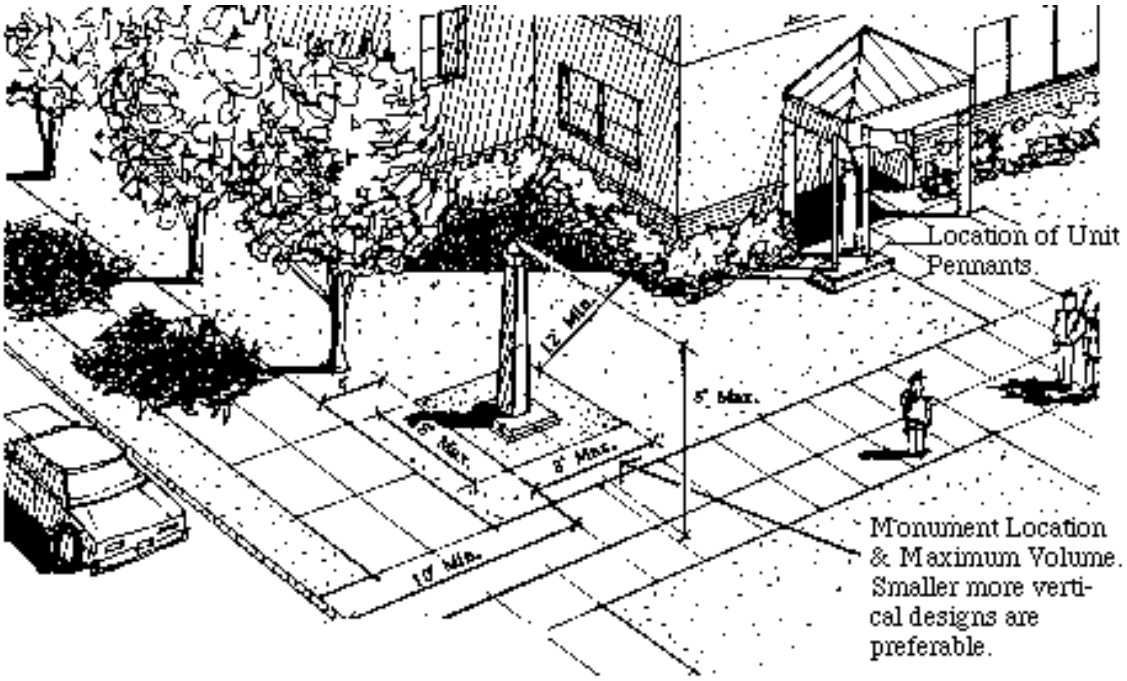
Battalion Monuments

Battalion Monuments are constructions that instill pride and identity. The location and size of these constructions should be carefully controlled as illustrated. While the creativity of each battalion should not be stifled, the design energy should be channeled in order to create a structure that is permanent and projects a professional image. Materials that will withstand the elements and facilitate maintenance should be selected
(See FL. 6-193 and FL. 6-194)



FL. 6-193

Existing Monument and Pennant. Careful Siting and Selection of Building Materials will Improve the Appearance.



FL. 6-194 Conceptual Illustration of Monument, Location and Size

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

Design Criteria Section

5 Lighting and Utilities

6.5 Lighting and Utilities 5.0

Introduction

GW LT CC SS TF FH OS
(Page 1 of 3)

This section includes two separate but related elements that have a signifi-cant impact on the visual environment (lighting and utilities). Both these ele-ments are most commonly associated with the street system or roadway right of way.

Lighting Overview

The exterior lighting system on the post provides visual impressions from both a functional as well as a perceptual point of view. Daytime pedestrian and vehicular activity is concentrated in certain visual zones, especially the Living Training, Community Services and Service/Support zones. Because Fort Lee is an open post with open spaces infiltrating it throughout and surrounded by a forest edge, activity concentration would become more apparent at night due to differences in required light levels. Some zones (i.e. Tenant Facilities) would seem separated from the rest of the post if surrounded by open spaces. What appears to be an open, campus-like environment psychologically changes personalities somewhat in the evening.

As is generally the case in the evening, the after office-hour syndrome occurs when many of the operations and facilities are closed and personnel have left the premises. Additionally, vehicular traffic is reduced and, what was hours earlier an active campus, now becomes a somewhat vacated environment.

Compounding this situation is the fact that the evening brings darkness and a uniform reduction of post visibility and presence. In recent years, there has also been a policy of reducing the night time exterior light levels to conform to energy conservation directives. In general, at night it is more difficult to orient oneself around the post than in the daytime environment.

In the evening, the lighting concentra-tion would occur in residential areas for both barracks-type housing and family housing. Community facilities in use would be lighted, and important buildings, monuments and gateways would be highlighted. Activity areas would be linked by lighted roadways, with the lighting level reflecting the roadway hierarchy.

The street luminaires, which in daylight receded into the tree and facade backdrop, become visible at night (as points of light) and set the new scale for the post. The visual quality of the light (which is low pressure sodium) is also negatively affected by the energy concerns. The relatively low light output and very distorted yellow/orange light quality casts a peculiar veil over the post at night.

Additional security lighting is needed, especially in storage areas and within the Service/Support and Tenant Facility zones. This is particularly important on an open post with public highways penetrating its perimeters.

Lighting Lamp Types

There exist a number of light sources available for exterior lighting. The following is a simple description of each type. This information is general only; for specific application more detailed design will be required:

6.5 Lighting and Utilities 5.0

Introduction

Low Pressure Sodium - This light source is very energy-efficient but puts out a very low level of light. The color rendition from the light is yellow/ orange and visually reflects plants and people poorly.

High Pressure Sodiurn - This light source is very efficient, relatively long-lived, with a high lighting level. The color rendition is pink/ orange which is not particularly flattering to plants or people. This is recommended for the public highways going through the post on the perimeters.

Mercury Vapor - The mercury vapor lamp is the longest-lived of any of the sources mentioned here. It is not as efficient as the high pressure sodium and produces lower lighting levels. The color of the light produced is bluish/green and not complimentary to people or plants, although it is not as offensive as high pressure sodium light. Color corrected mercury vapor is even less offensive and should be used instead of mercury vapor.

Metal Halide - Metal halide is between mercury vapor and high pressure sodium in both efficiency and longevity. It has good color rendition and is not psychologically offensive to people.

Incandescent - This lamp type has the most pleasing color of all light sources. However, low efficiency and short life span limit its use except in special areas where its warm color rendition characteristics are required.

Required illumination levels are determined by the amount of nighttime activity that will take place in a given area. Primary streets will be bright lit than secondary streets.

Housing areas should be lit at the lowest level allowed for safety. Standards for foot-candle levels should be followed for the different use areas with allowances for special conditions and will require specific engineering/ design studies.

Lighting Recommendations

Our recommendations at this point in time are broad brush in nature and discuss solutions in a generic sense. In an effort to comprehend these recommendations, it is important to understand a basic physical requirement which is: light to see by as distinguished from light you see. This physical requirement calls for sufficient light without distraction and with appropriate direction and diffusion. It is a simple requirement, but within its general framework, the precise amount and placement of light (not fixtures) will vary widely according to the demands.

Light Source/Lamp Type Recommendations

* A single light source type should be used throughout an entire visual zone and preferably throughout the entire street and roadway system.

* Color-corrected Mercury Vapor or Metal Halide is recommended for the entire post but especially the higher visibility areas of the Gateway, Community Center, Living/Training and Tenant Facilities areas.

6.5 Lighting and Utilities 5.0

Introduction

* Incandescent light should be utilized in the Family Housing Zone associated with a surface-mounted house light program.

Lighting Application

* Appropriate fixture types are described in detail in the following pages of this section.

* In general terms more emphasis should be placed on illuminating building facades, especially the more symbolic and significant architectural structures and portions of the Headquarters area. This will have both a symbolic visual improvement effect, as well as an improved security impact.

* Lighting should be reflected off building facades rather than light sources being mounted on and shining away from building facades. Reflected light has a much more beneficial impact and should be carefully placed to minimize offensive glare.

Utility Systems Overview

The utility systems are the infrastructure that carry and distribute power, water, gas, steam, wastes and communications throughout the post. While these systems are essential to the operations of the post, their functional requirements must not dominate the streetscape.

Utility Recommendations

* As a general rule, utility systems should be combined and placed underground. This is especially true in high visibility areas.

* Where underground placement is not possible and where distribution systems necessitate above-ground placement; careful coordination must be carried out to assure that unsightly utilitarian equipment is located and screened from view The pages that follow in this section; will address these techniques in more detail.

6.5 Lighting and Utilities 5.1

6.5.1 Light Matrix GW LT CC SS TF FH OS

Selection of Fixtures

The following matrix is a summary of the light fixtures to be used on post within the appropriate visual zones. Refer to pages DC 5.2, 5.3 and 5.4 for specific fixture types, and to DC 5.5.1-5.5.2 for specific recommendations on location and application. The three columns below contain the following information: Light Fixture (General Description), Application, and appropriate Visual Zone. Though there may be exceptions to Application and Visual Zone, the matrix may be used as a general guide followed by more detailed information on installation and location.

Light Fixture	Application	Visual Zone: GW	LT	CC	SS	TF	FH	OS
1. Square Cutoff Luminare	A. Roadways	●	●	●	●	●	●	●
Single Luminare	B. Walkways	●	●	●	●	●	●	●
	C. Parking Lot Perimeter	●	●	●	●	●	●	●
	D. Service Areas	●	●	●	●	●	●	●
Double Luminare	Parking Lot Islands	●	●	●	●	●	●	●
2. Light Bollard - Aluminum	Plazas & Courtyards		●	●	●	●		
3. Flood Lights	A. Recreational Fields		●		●	●	●	
	B. Security Lighting	●	●	●	●	●		
4. Accent Lighting	A. Ceremonial Areas, Monuments	●	●	●	●	●	●	●
	B. Architectural Highlighting	●	●	●		●		●

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6.5 Lighting and Utilities 5.2

6.5.2 Light Fixtures

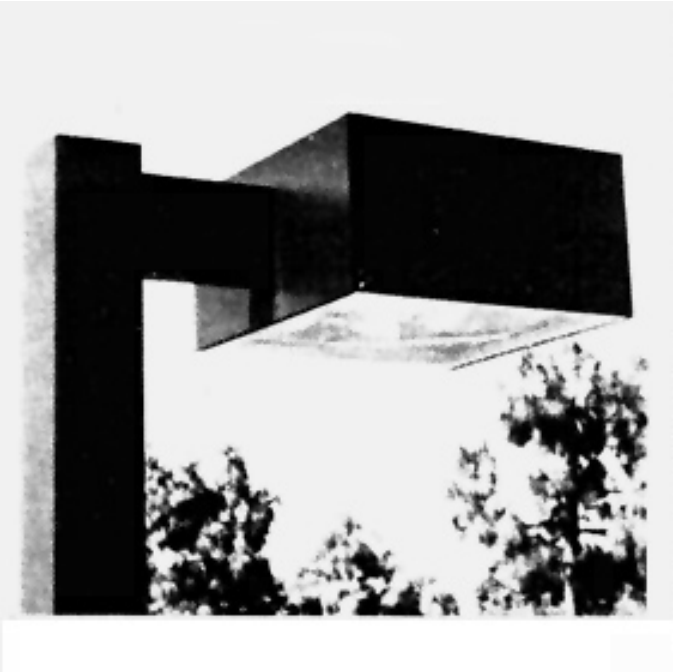
GW LT CC SS TF FH OS
(See Lighting Matrix)

Single-mount Cut-off Fixture
(See FL. 6-195)

Double-mount Cut-off Fixture
(See FL. 6-196)

1. .Fixture

Description	Square, cut-off fixture
Material:	Cast aluminum pole and housing
Color:	Black finish on all parts
Application:	Roadways - single mount Parking Lots - single mount on periphery; double mount within parking lots in curbed islands as required Walkways - single mount (See Application Section for height range of fixtures
AsManufactured by or Equal to:	Kim Lighting by Kidde 16555 E. Gale Ave. P.O. Box 1275 Industry California 91749 818-330-3861
Model No.:	Series - CCL 329,325, 320 or 529, 525, 520; PBCI or PCCL Poles with optional Lexan Shield



FL. 6-195
Single-mount Cut-off Fixture

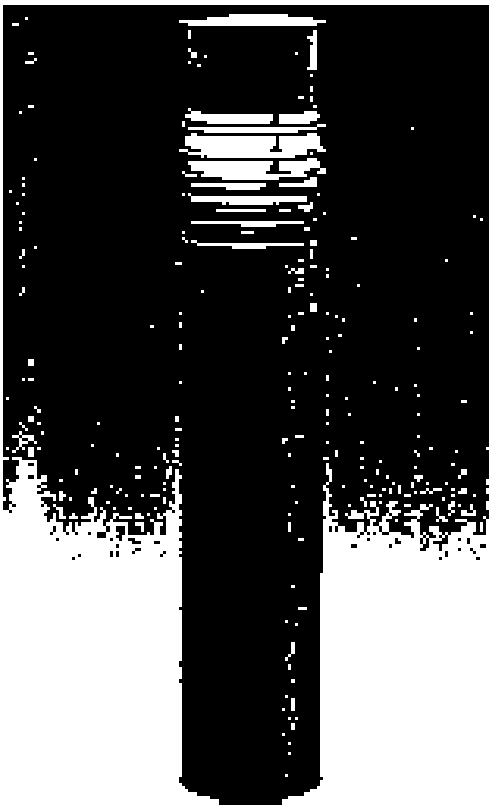
FL. 6-196
Double-mount Cut-off Fixture

6.5 Lighting and Utilities 5.3

6.5.2 Light Fixtures GW LT CC SS TF FH OS

Light Bollard (See FL. 6-197)

2. .Fixture	Contemporary Cylindrical
Description	Light Bollard
Material:	Cast Aluminum
Color:	Black finish clear Polycarbonate diffuser
Application:	Pedestrian areas
AsManufactured by or Equal to:	Sterner Lighting Systems, Inc. Winstead Minnesota 55395 612-485-2141
Model No.:	Annapolis Round ART - 12” Dia. Bollard Ht. - 36”
3. .Fixture Description	Floodlights
Application:	As required for recreational fields, high security areas
AsManufactured by or Equal to:	GTF Sylvania Lithonia Lighting North American Phillips Prescolite Progress Lighting Sentry Electric



FL. 6-197
Light Bollard

Light fixtures should be selected on basis of functional requirements in areas of low visibility.

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6.5 Lighting and Utilities 5.4

6.5.2 Light Fixtures GW LT CC SS TF FH OS

4. .Fixture

Description	Accent Lights
Application:	Ceremonial areas, monuments, any site of building feature requiring highlighting
AsManufactured by or Equal to:	Kim Lighting by Kidde 16555 E. Gale Ave. P.O. Box 1275 Industry California 91749 818-330-3861

Light fixtures should be selected to provide accent lighting for significant structures and monuments. Fixtures should be screened from view as much as possible.

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6.5 Lighting and Utilities 5.5.0

6.5.3 Locating Electric and Telophone Lines

GW LT CC SS TF FH OS

Unsightly overhead utilities in high-visibility areas are to be relocated underground wherever possible. This program should be implemented as new development projects provide opportunities for relocation of electric and telephone lines.
(See FL. 6-198)

Recommendation A:
Underground Lines.

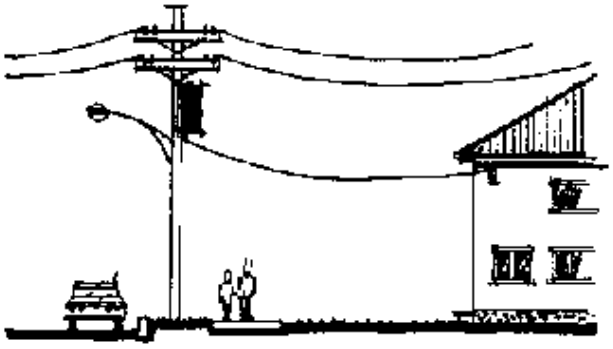
* Lines are to be buried in grass strip along curb, minimizing conflicts with paving, lighting and street trees. (See FL. 6-199)

* Service to individual buildings underground; meters (when req'd.) on side or rear walls.

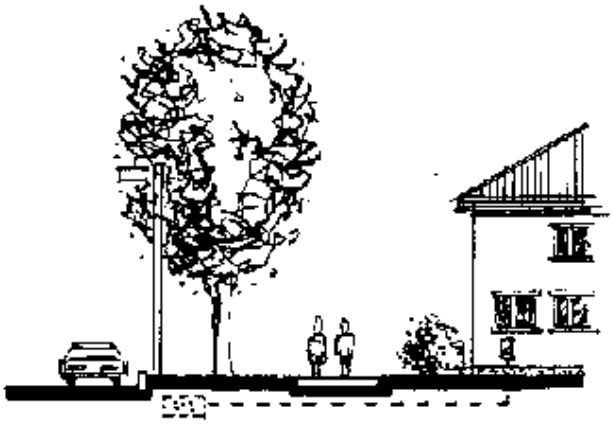
* Transformers to be ground-mounted in low-visibility locations.

Recommendation B:
Setback behind street trees, or to rear of buildings.

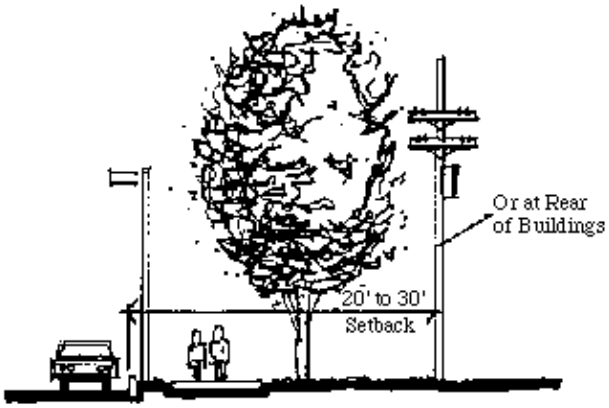
* Set back utility poles 20' to 30' from roadway and screen with row of street trees (40' o.c.). (See FL. 6-200)



FL. 6-198
Not Recommended



FL. 6-199
Recommendation A



FL. 6-200
Recommendation B

6.5.3 Locating Electric and Telophone Lines

GW LT CC SS TF FH OS

Roadway Lighting

Pole adjacent to walkway

* Place pole a minimum of 2' from edge of walkway. (See FL. 6-201)

Pole adjacent to curb street

* Place pole a minimum of 3' from back of curb. (See FL. 6-202)

* Spacing of poles will be determined by light source and layout pattern; follow manufacturer's specifications.

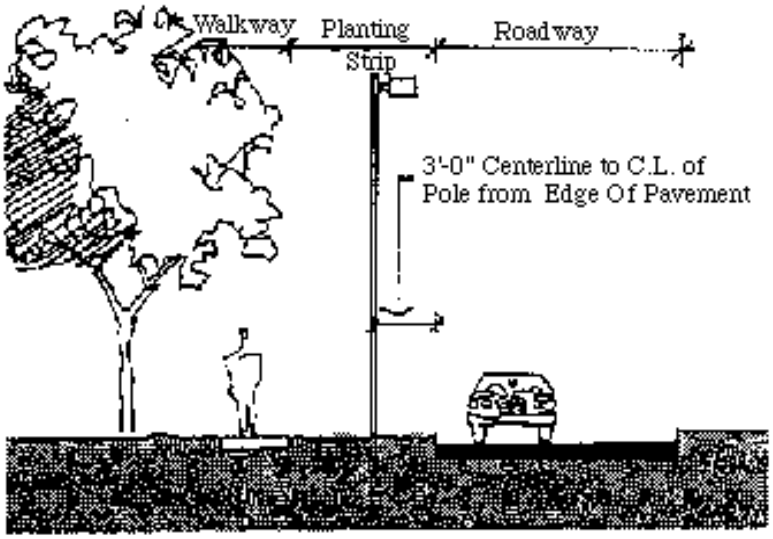
Pole Height & Spacing Guidelines

* Varying assumptions of light source and placement will affect pole placement and height. Assume here one side of road only, 1.0 footcandles, single mount and high pressure sodium light source.

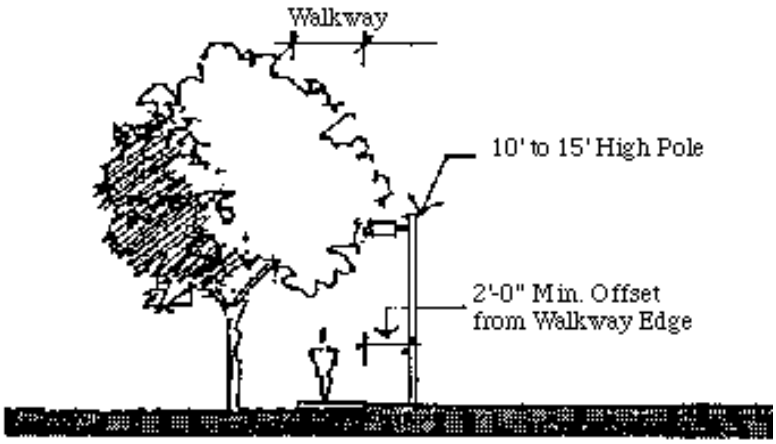
  Primary Road or Highway (Road width + 50')
  Pole Height: 30'- 40'
  Pole Spacing: 130' o.c.
  (250 Watt light source)

  Secondary Road (Road width +40')
  Pole Height: 25'- 30'
  Pole Spacing: 115' o.c.
  (200 Watt light source)

  Tertiary Road (Road width +35')
  Pole Height: 15'- 20'
  Pole Spacing: 100' o.c.
  (100 Watt light source)



FL. 6-201
Light Pole Adjacent to Walkway



FL. 6-202
Light Pole Adjacent to Street

6.5 Lighting and Utilities 5.5.2

6.5.3 Locating Electric and Telophone Lines

GW LT CC SS TF FH OS

Parking and Pedestrian Lighting

Parking Lot Lighting

Place a light pole at perimeter of lot, a minimum of 3' from edge of curb. Fixtures at perimeter should be single-mounted. (See FL. 6-204)

Place double-mounted fixtures on interior planting islands between parking bays. Pole should be a minimum of 3' from edge of curb.

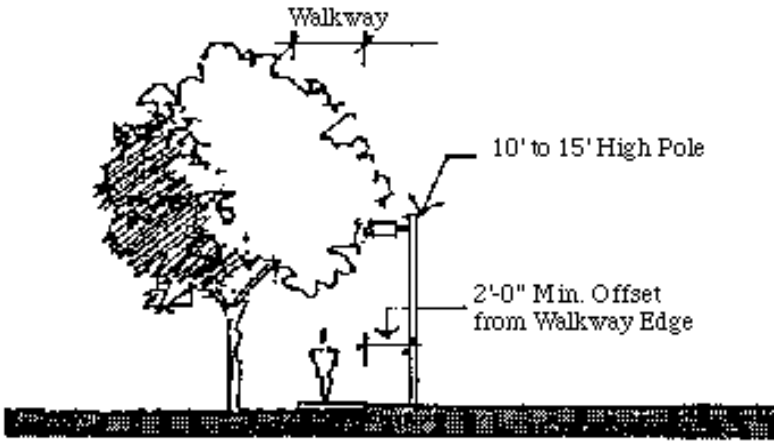
Where no planting island exists, light pole should be placed on 3' high round concrete pier or protected with pipe ballards.

Spacing of poles will be determined by light source and layout pattern; follow manufacturer's specifications.

Pole Height & Spacing Guidelines
Parking Areas

Varying assumptions on light source and placement will affect pole placement and height. Assume here double-mounted fixture, high pressure sodium, and 2 footcandles.(See FL. 6-203)

Parking Lot
Pole Height: 25’-30’
Pole Spacing: 100’-150’ o.c.

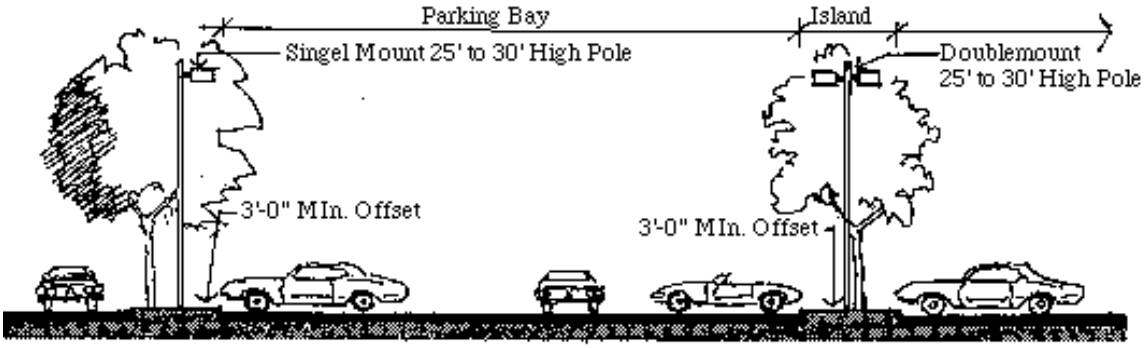


FL. 6-203
Typical Pedestrian Lighting

Pole Height & Spacing Guidelines
Pedestrian Areas

Varying assumptions on light source and placement will affect pole placement and height. Follow manufacturer's specifications. Assume here a high pressure sodium light source, single-mounted fixture and 2-5 footcandles.

Pedestrian Areas
Pole Height: 10’-15’
Pole Spacing: 50’-55’ o.c.



FL. 6-204. Typical Parking Lot Lighting

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6.5 Lighting and Utilities 5.6

6.5.4 Utilities Matrix

GW LT CC SS TF FH OS

(Page 1 of 2)

This matrix is a brief summary of the existing and proposed utilities on post, and how they are to be screened or relocated within each visual zone.

Utility Type	Visual Zone							Action to be Taken
	GW	LT	CC	SS	TF	FH	OS	
1. Existing Overhead Utilities	●	●	●	●	●	●	●	A. Wherever possible place utility lines underground.
			●	●	●	●	●	B. Where underground placement is not possible, relocate to the rear of buildings and in service areas.
2. New Utilities	●	●	●	●	●	●	●	A. Locate underground wherever feasible.
3. Existing/New Transformers and Substation	●	●	●	●	●	●	●	A. Near buildings locate to the rear and/or rear service areas; screen with walls, fences, berms, or planting. Size of unit to be as small as possible.
	●	●	●	●	●	●	●	B. Along roadways screen from view with berms, plantings, and fencing. Use existing vegetation for screening as much as possible.

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6.5 Lighting and Utilities 5.6

6.5.4 Utilities Matrix GW LT CC SS TF FH OS

(Page 2 of 2)

Item	Visual Zone							Application
	GW	LT	CC	SS	TF	FH	OS	
4. HVAC Units	●	●	●	●	●	●	●	A. Locate within service areas or to rear of buildings. Screen.
		●	●					B. In areas of extremely high visibility every effort should be made to place units on top of building screened from view by a parapet of screen wall.
	●	●	●	●	●	●	●	C. Window AC units should be eliminated in all zones.
5. Storm Inlets	●	●	●	●	●	●	●	A. Install bike-proof grates.
6. Existing Drainage Ditches	●	●	●	●	●	●	●	A. Eliminate where possible by underground piping to meet drainage requirements.
	●	●	●	●	●	●	●	B. Use grass swales with lawn inlets where drainage
require-								ments are not great

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Design Criteria Section

6 Signs

6.6 Signs

6.6 Signs 6.1

6.6.1. General Notes GW LT CC SS TF FH OS

Signage throughout the installation must be skillfully managed and coordinated according to an overall Signage Master Plan, prepared and maintained by the DPW.

The goal of this design criteria is the establishment of a hierarchy of information and sign types which presents information clearly, projects a unified image and is flexible and adaptable to accommodate a wide range of message requirements. The pages that follow describe a coordinated "menu" of sign types and sizes.

Current Policy

Recently a program to upgrade signage throughout the installation has been implemented with some success. A limited set of signage guidelines were developed as part of the Fort Lee Post-wide Paint/Exterior Finish Guide, produced by the DPW in 1986. Those guidelines established certain color, material and size standards which have been incorporated into this design criteria. Sign types Al, A2, and B1 are adopted from the previous policy, while the rest of the sign types expand the range of choices to adequately accommodate the full scope of Fort Lee's signage requirements.

Application of Criteria

Even with the most extensive design controls, any signage policy must be skillfully adapted to each situation. Although the appearance of consistency and standardization is important, this effect can only be achieved by carefully adapting signage design criteria to particular circumstances. Rigidly applied controls frequently result in specific solutions that are uniform, but appear to be inappropriate. Most important, the information itself must be carefully condensed and organized on the signs in an efficient hierarchical fashion. The spatial arrangement of the information on each sign is itself part of the message, and is as important as the specific wording.

Other References

Virginia Uniform Traffic Code Manual

6.6 Signs

6.6.2. Sign Types and Dimensions

GW LT CC SS TF FH OS

(Page 1 of 2)

Recommendations for selecting sign types and panel sizes:

The illustrations on the following page demonstrate most choices and combinations necessary to accommodate any message requirement. Wherever possible, limit choices to those included on page 6.2 so that signage throughout the post will be coordinated. (See FL. 6-205)

Certain sign sizes and shapes must be visually associated with specific categories of information. Message types must therefore be restricted to a limited set of sign size/shape options. Refer to the chart on the following page for permitted sign type choices for your message type.(See FL. 6-205a)

Type A and Type B signs are to be the post-wide standard for most messages. When used for identification signs, the size and proportion of the sign board is to be determined by the command level associated with the function identified: (For Type A signs See FL. 6-206A1, FL. 6-206A2, FL. 6-206A3, FL. 6-206A4). (For Type B signs See FL. 6-207B1, (See FL. 6-207B2, FL. 6-207B3, FL. 6-207B4, FL. 6-207B5, FL. 6-207B6, FL. 6-207B7, FL. 6-207B8, FL. 6-207B9, FL. 6-207B10)

Command Level	Sign Type	Dimensions (w x h)
Maj. Directorate	A2	4'8"x4'0"
Brigade	A2	4'8"x4'0"
Battalion	A2	4'8"x4'0"
Division	A3	3'0"x2'0"
Branch	A3	3'0"x2'0"
Section	A3	3'0"x2'0"
Company	A3	3'0"x2'0"
CDR/CSM/Name signs	A4	24"x 4"
Subordinate Division	B1	2'4"x2'4"

Type C (monumental/pylon signs) are to be used for major identification signs or for post identification signs at the major roadways entering the installation. Sign type C1 should be limited to post identification use, and is recommended for use in the center of the median of Route 3 6 at the points where the highway crosses the post boundary. (See FL. 6-208C1 and FL. 6-208C2)

Type C2 may be used for identifying important buildings or complexes.

FL. 6-205
Typical Example of Identification Sign

6.6 Signs

6.6.2. Sign Types and Dimensions

GW LT CC SS TF FH OS

(Page 2 of 2)

Type C signs are to be used sparingly. They are very special signs which must command attention. Do not place two type C signs within 500 ft. (min.) of each other.

Mounting heights are to be consistent. Use 8'0" ht. and dimension to top of frame for types At, A2. Use 7'0" ht. for types A3 and A4. See DC 6.2 for complete mounting height information.

In general, the size and height should be minimized, wherever possible, to reduce visual clutter.

Choose a sign sized as small as possible which will adequately do the job. Choose the 2' or 3' mounting height for type B signs whenever this will satisfy the message requirements.

Organize the information on the sign to be brief, clear, and concise.

Note:
Identification signs are those that state the name of the building or facility at that location. *Directional signs* point the way to a destination with an arrow. *Directory signs* are those that list a series of destinations within a building or in an area of the post, and may serve as secondary information to an identification sign. *Informational signs* convey other general messages such as schedules, policies or regulations. *Mandatory signs* carry imperative regulatory messages such as warnings and restrictions; and, must have prior approval from DPW Traffic Review Board. ***Regulatory signs* are to be accomplished by DPW only.** *Motivational signs* are those that carry inspirational slogans to support training and morale.

● Permitted

○ Message Permitted on Secondary Sign Board Only.

Type of Message Required / Type of Sign (DC 6.2):	Identification Signs	Directional Signs	Directory Signs	Informational Signs	Mandatory/Prohibitory Signs	Motivational Signs
A1	●					
A2	●					
A3	●					
A4			●			
B1	●	○	○			
B2	●	○	○	●	●	●
B3		●	●			
B4		●	●			
B5	●					
B6	●			●	●	
B7						●
B8					●	●
B9	●				●	
B10		●		●	●	
C1	●					
C2	●					

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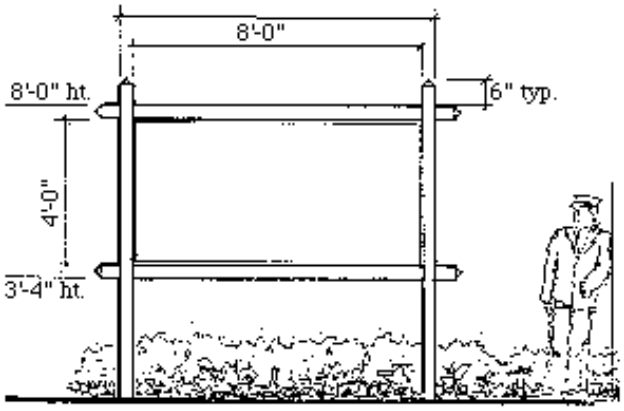
6.6 Signs 6.2.1

6.6.2. Sign Types and Dimensions

GW LT CC SS TF FH OS

(Page 1 of 2)



FL. 6-206
A1

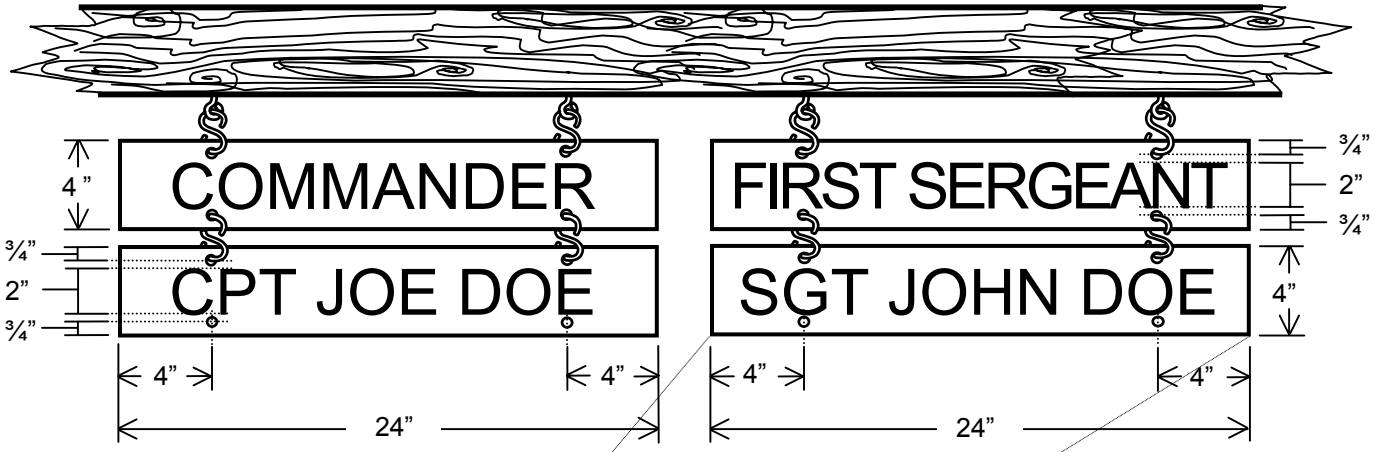
Type A Signs

6.6 Signs

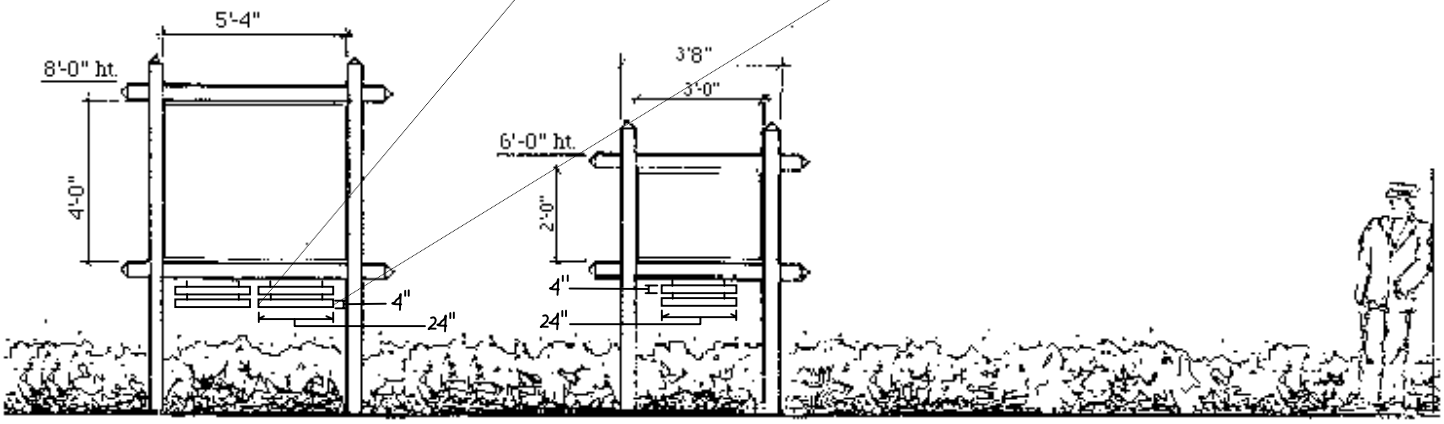
6.6.2. Sign Types and Dimensions

GW LT CC SS TF FH OS

(Page 2 of 2)



FL. 6-206
A4



FL. 6-206
A2

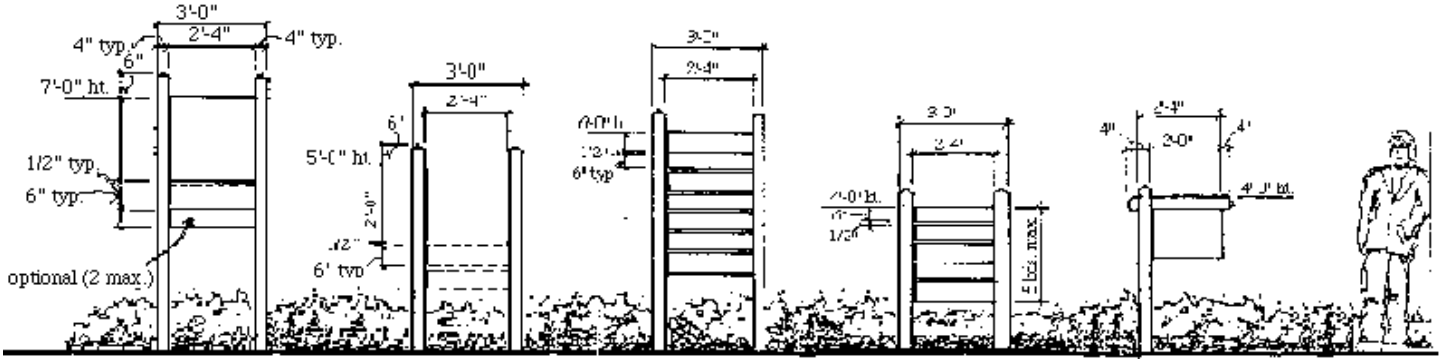
FL. 6-206
A3

6.6 Signs 6.2.2

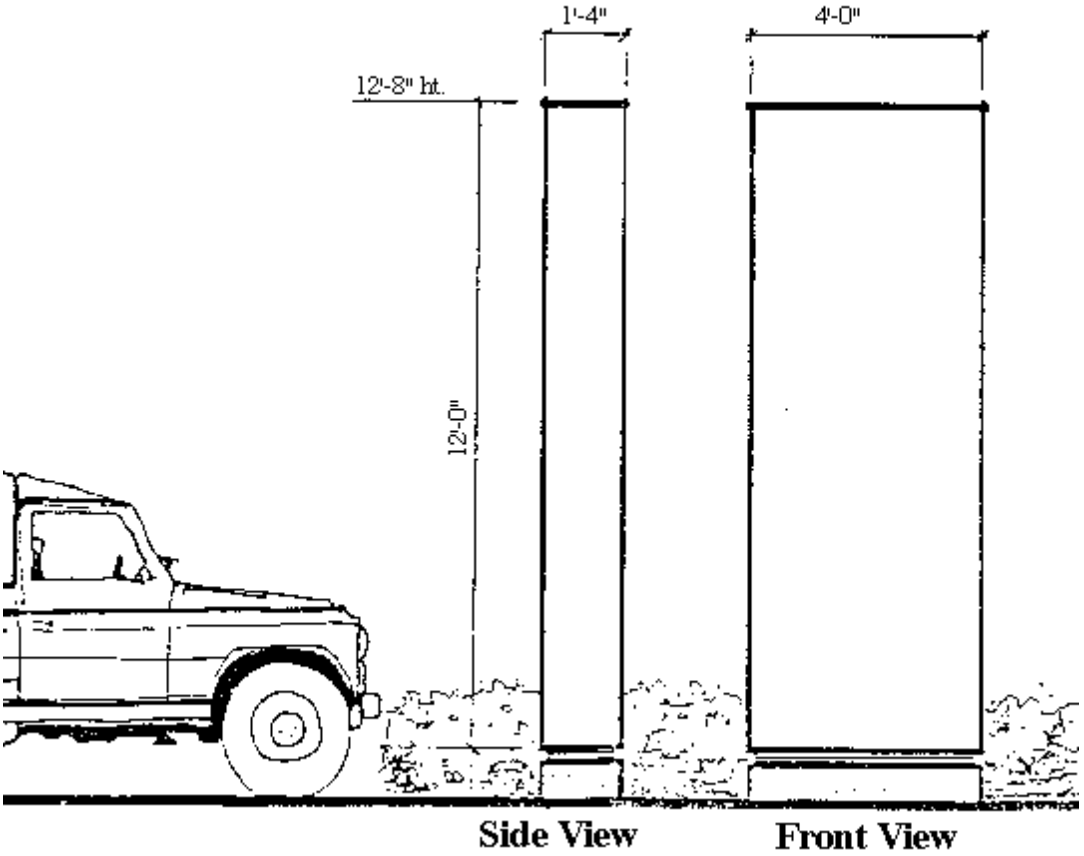
6.6.2. Sign Types and Dimensions

GW LT CC SS TF FH OS

(Page 1 of 2)



FL. 6-207 B1 **FL. 6-207 B2** **FL. 6-207 B3** **FL. 6-207 B4** **FL. 6-207 B5**



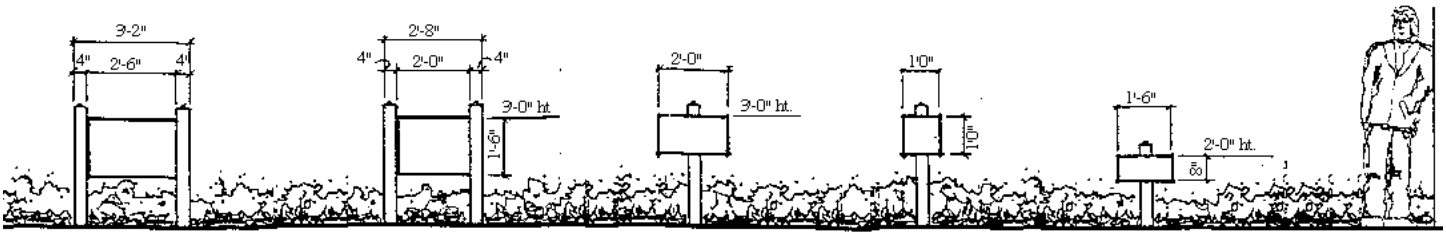
FL. 6-208
C1

6.6 Signs

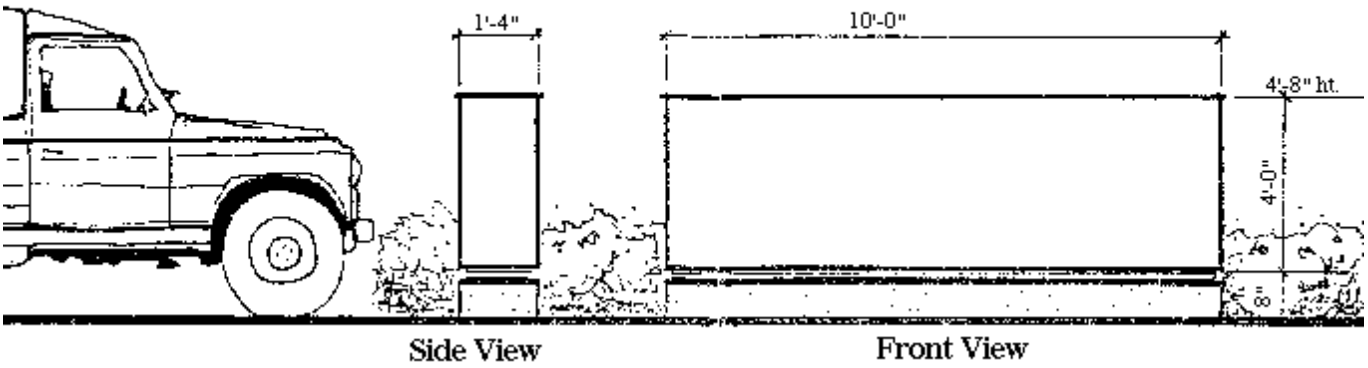
6.6.2. Sign Types and Dimensions

GW LT CC SS TF FH OS

(Page 2 of 2)



FL. 6-207	FL. 6-207	FL. 6-207	FL. 6-207	FL. 6-207
B6	B7	B8	B9	B10

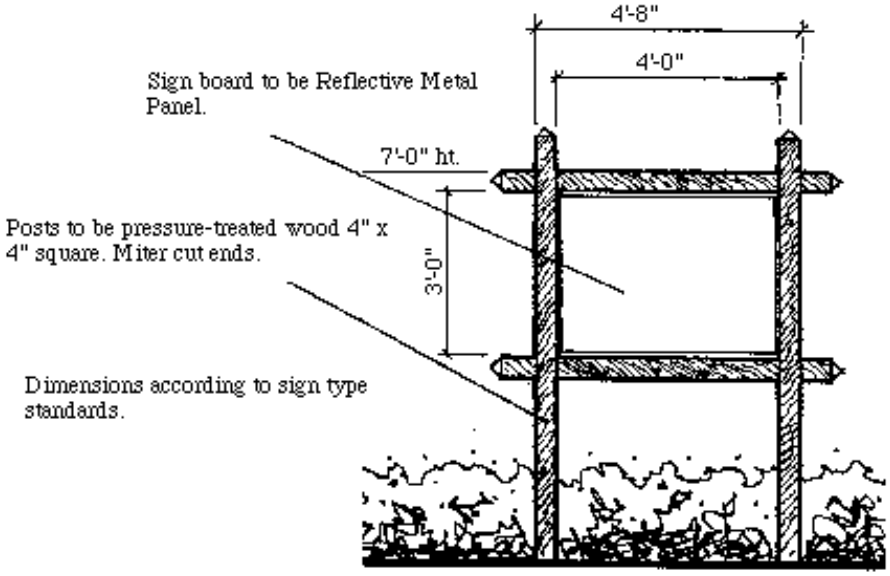


FL. 6-208
C2

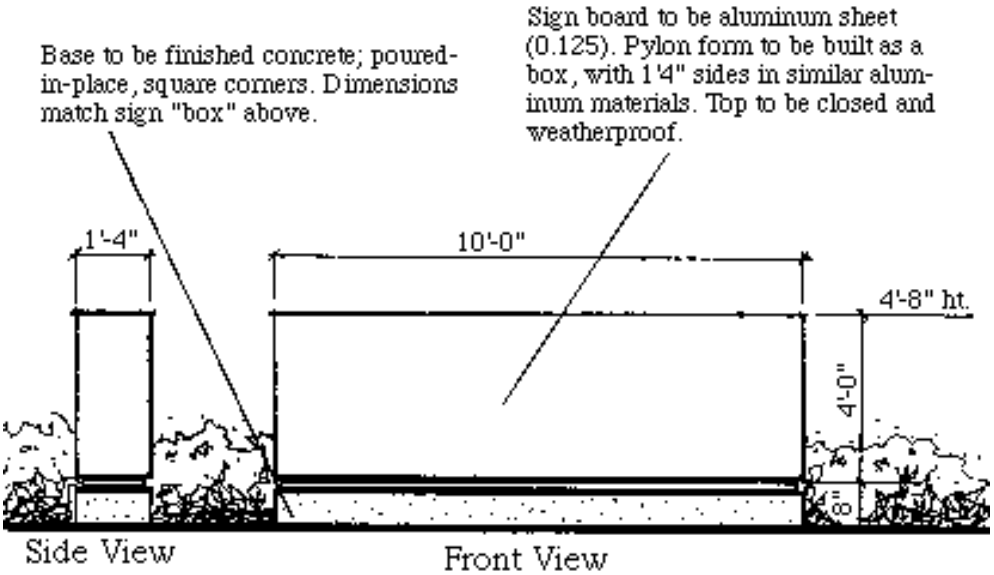
6.6 Signs 6.3.1

6.6.3. Materials and Fabrications GW LT CC SS TF FH OS

For Type A signs. (See FL. 6-209 and FL. 6-211)
For Type B signs. (See FL. 6-212, FL. 6-213)
For Type C signs. (See FL. 6-210)



FL. 6-209
Type A3 (Example)



FL. 6-210 Type C2 (Example)

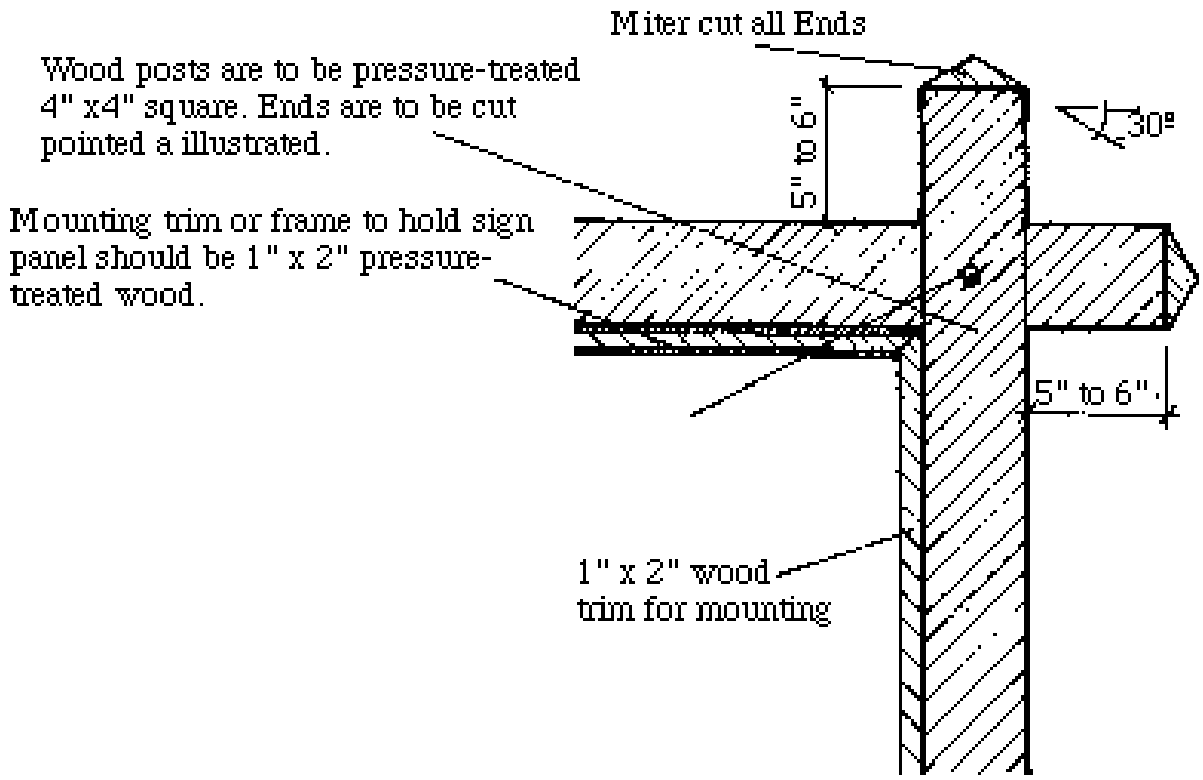
☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.6 Signs 6.3.2

6.6.3. Materials and Fabrication GW LT CC SS TF FH OS

Type A

General Notes



FL. 6-211
Type A Signs
Corner Detail

Materials and Fabrication

Type A and B Signs

Sign blanks to be 080 gauge aluminum both sides coated with 3M 3279 brown reflective scotchlite

Letters and borders are to be 3M 3290 white reflective scotchlite.

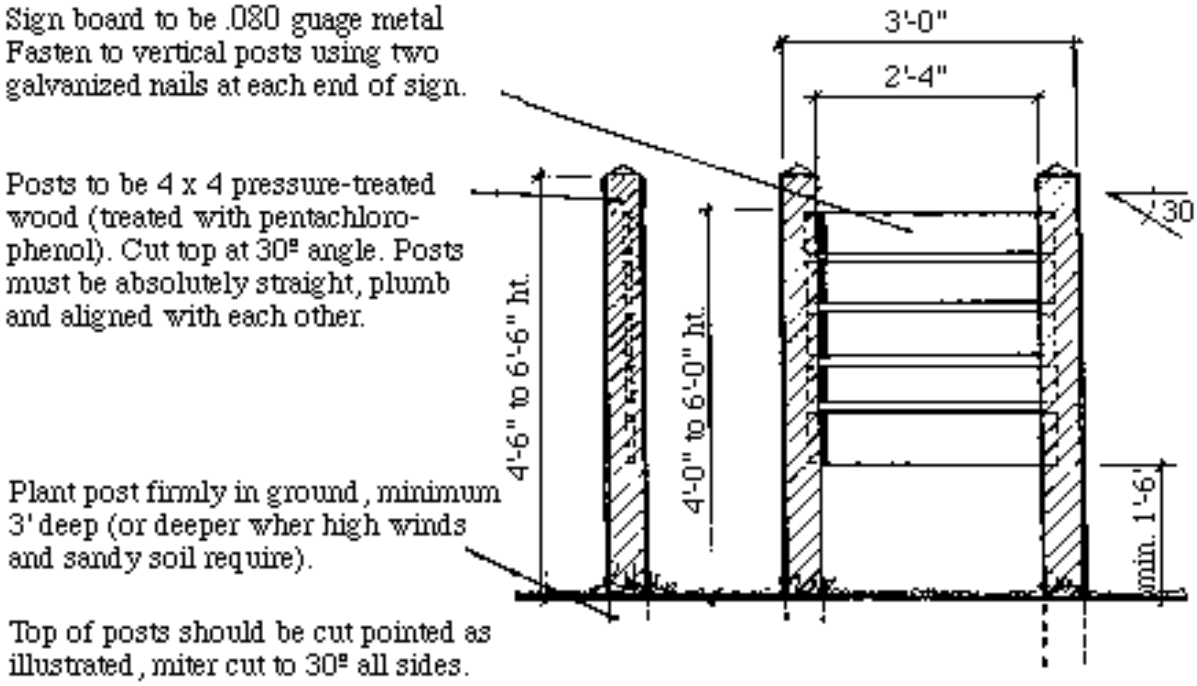
Dimensions according to sign type standards.

Post are to be pressure-treated wood 4”x 4” square. Miter cut ends.

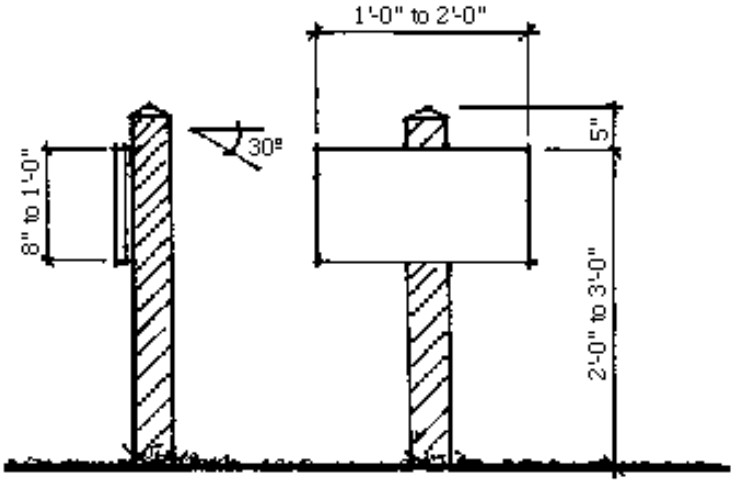
6.6 Signs 6.3.2

6.6.3. Materials and Fabrication GW LT CC SS TF FH OS

Type B



FL. 6-212
Type B3 / B4 (Example)



FL. 6-213
Type B8 / B9 / B10 (Example)

6.6 Signs 6.4

6.6.4 Colors GW LT CC SS TF FH OS

Sign to be 3M Brown Reflective Scotchlite

3/8" wide border to be white reflective Scotchlite.

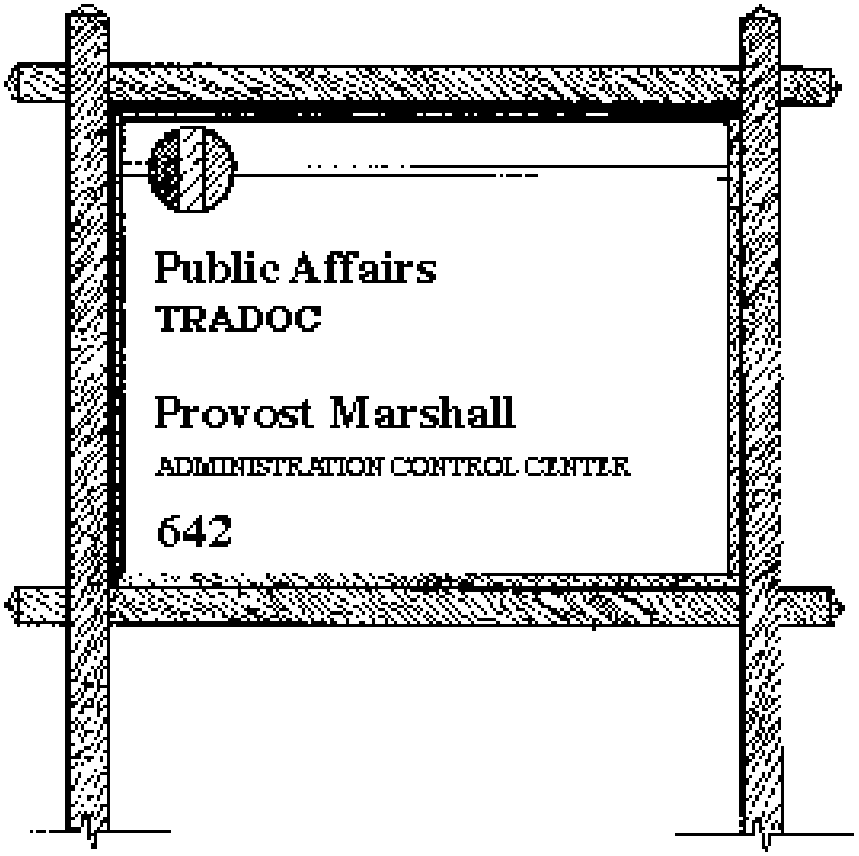
Unit insignia in standard colors of emblem. Outline in gold to distinguish from background.

Lettering to be white adhesive-backed vinyl die-cut type, reflective to auto headlights at night.

Supports to be unfinished pressure-treated wood.

Secondary sign colors to match primary signs.

If backside of sign carries no message, then coat it with 3M Brown Reflective Scotchlite.



FL. 6-214
Type A2 (Example)

☐ AR ☐ LA ☐ CE ☐ ME ☐ EE ☐ MT

6.6 Signs 6.5

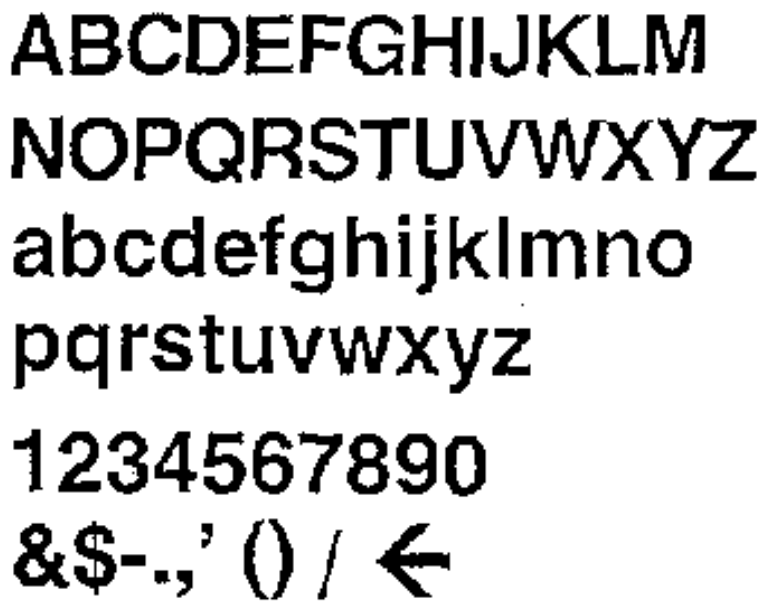
6.6.5. Typography GW LT CC SS TF FH OS

Typeface Style

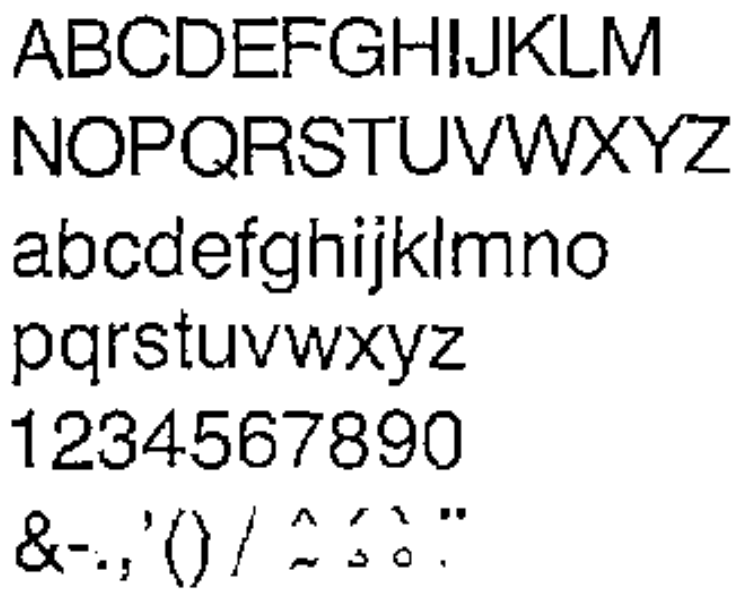
Two typefaces are to be used on the Post signs: helvetica medium and helvetica regular. Traffic control signs are exempted (they should follow Standard Alphabets for Highway Signs and Pavement Mark lines, published by Federal Highway Administration) .

Helvetica medium is to be used for major information on all signs such as the primary name of a building, or general name of an area such as "Command Center". Use helvetica medium for all directional signs (wherever an arrow is used).
(See FL. 6-215)

Helvetica Regular is to be used for secondary information, such as the names of commanders, or specific units within building and other short messages which support the primary information.(See FL. 6-216)



FL. 6-215
Helvetica Medium



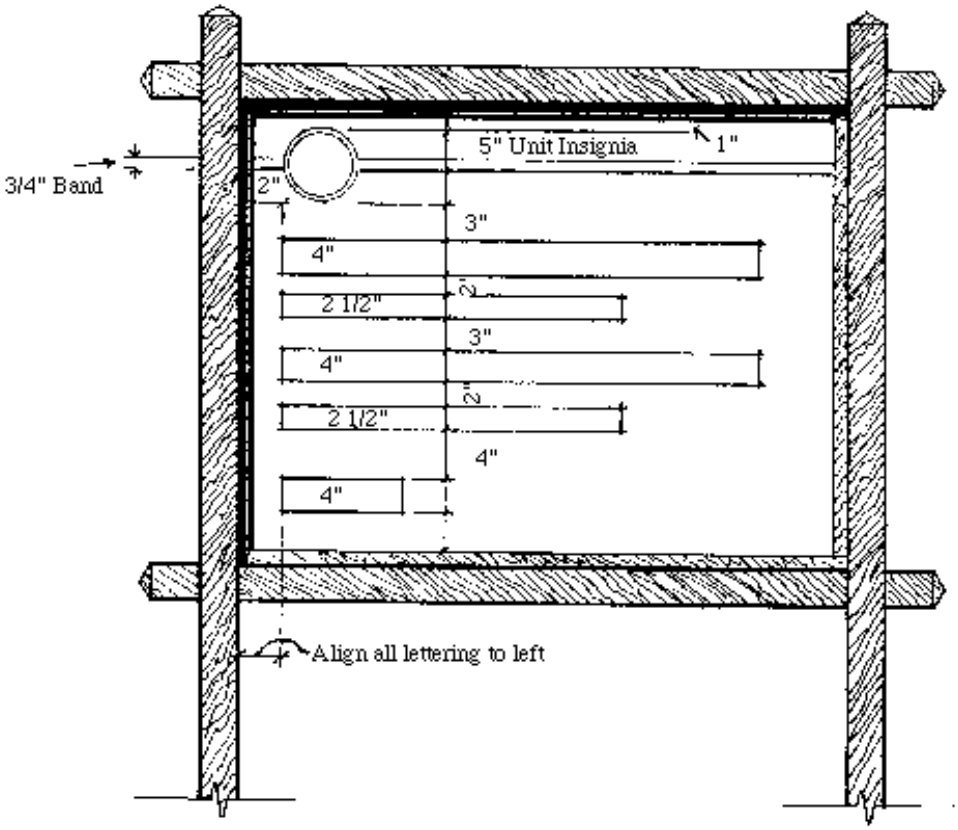
FL. 6-216
Helvetica Regular

6.6 Signs 6.6.1

6.6.6 Sign Layout GW LT CC SS TF FH OS

Type A Signs (See FL. 6-217 and FL. 6-218)

FL. 6-217
Existing Sign



FL. 6-218
Type A2 (Example)

6.6.6 Sign Layout

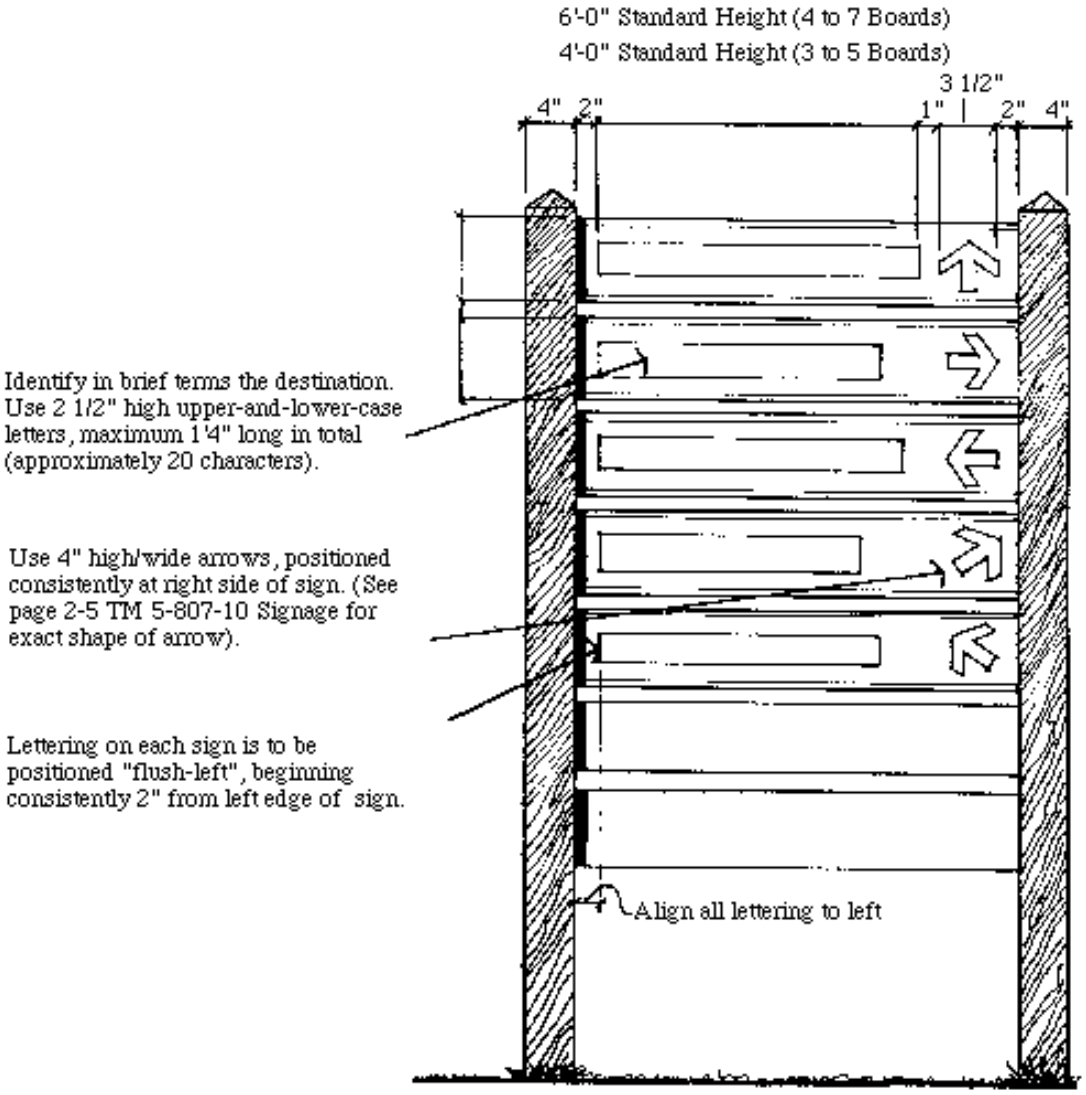
GW LT CC SS TF FH OS

Type B, Directional /Directory

Use helvetica medium, upper-and-lower-case letters for all destinations. (See FL. 6-219)

Important Note:

Keep messages brief. Directional messages must be read and understood quickly.



FL. 6-219

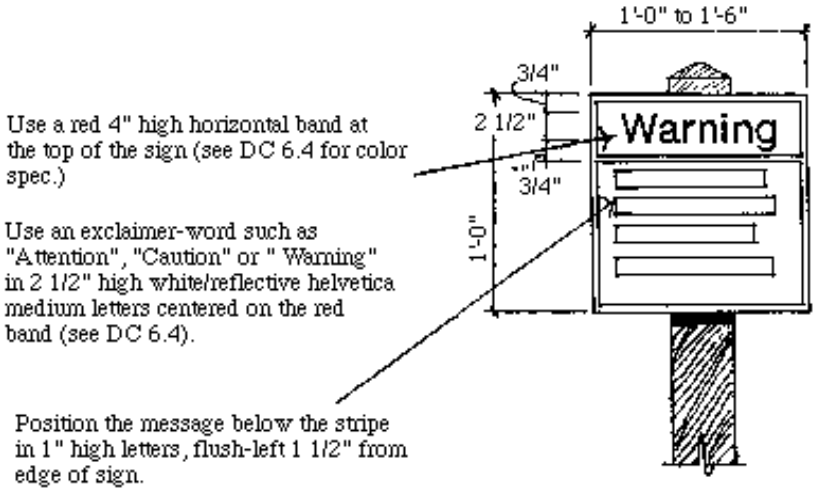
Type B3 (Example)

6.6 Signs 6.6.3

6.6.6 Sign Layout GW LT CC SS TF FH OS

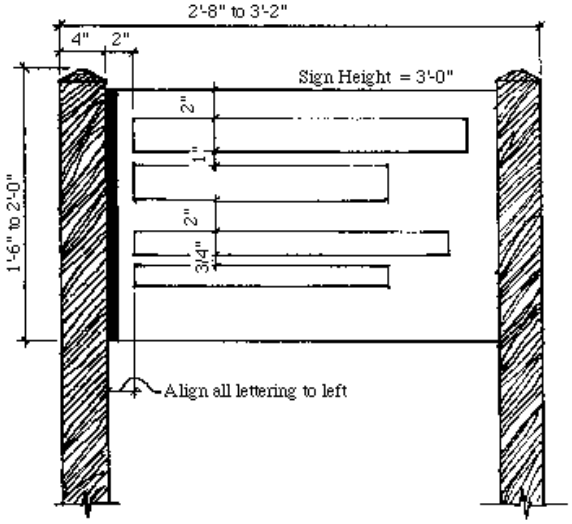
Type B; Regulatory/Informational

Mandatory information, regulations, prohibitions and warning messages must be distinguished from other sign types by use of separate sign boards with an accent stripe. (See FL. 6-220)



FL. 6-220
Type B9 Example

General information on medium-sized sign boards to be presented in 1" to 2.5" high letters beginning flush-left 2" from edge of sign. Primary information in 2.5" letters; secondary information in 1" or 1.5" letters. Use only 2 different letter sizes per sign. (See FL. 6-221)



FL. 6-221
Type B6 / B7 (Example)

ATTACHMENT 6
PLANT LIST

PLANT LIST

1 GENERAL

1.1 TREES

Common Name

Japanese Maple
Norway Maple
Red Maple
Southern Magnolia
Bradford Pear
Black Walnut
Pin Oak
Willow Oak
Japanses Scholar Tree
Little Leaf Linden

1.2 ORNAMENTAL TREES

Common Name

American Redbud
Kousa Dogwood
Washington Hawthorn
Kwanzan Cherry
Paw Paw

1.3 EVERGREEN TREES

Common Name

American Holly
Norway Spruce
White Pine
Japanese Black Pine
Virginia Pine

1.4 SHRUBS

Azalea species
American Boxwood
Yellowtwig Dogwood
Dwarf Berford Holly
Juniper
Mountain laurel
Common Purple Lilliac
Japanese Yew

1.5 GROUND COVER

Ajuga
Wintercreeper
Lilly Turf
Japanese Spruge
Periwinkle

ATTACHMENT 7

Invasive Plant and Insect Guidance

DEPARTMENT OF THE ARMY
UNITED STATES ARMY COMBINED ARMS SUPPORT COMMAND AND FORT LEE
3901 A AVENUE SUITE 200
FORT LEE, VIRGINIA 23801-1809

REPLY TO
ATTENTION OF

FORT LEE POLICY NO. 34-01

ATZM-EMO 4 September 2001

MEMORANDUM FOR FLOFMAIL/FLOTMAIL

SUBJECT: Minimizing the Introduction and Spread of Invasive Plant and Insect Species on Fort Lee, VA

1. **Purpose**. The purpose of this policy is to establish adequate procedures to reduce the potential introduction and spread of invasive species on Fort Lee, VA.

2. **References**.

a. National Invasive Species Act of 1996 (P.L. 104 –332).

b. Federal Noxious Weed Act of 1974 (with amendments).

c. Executive Order 11987, Exotic Organisms, 24 May 77.

d. Executive Order 11312, Invasive Species, 3 Feb 99.

e. Invasive Alien Plant Species List of Virginia – Virginia Department of Conservation and Recreation.

3. Background. Invasive plants and insects are species that have been introduced into an environment where they did not evolve. As a result, these species usually have no natural enemies to limit their reproduction and spread. These species threaten biodiversity, threatened and endangered species, and the training mission - by rendering portions of training areas unusable. Invasive species have been introduced to Fort Lee by natural migration and through the transportation and planting of nursery stock. It is impossible to completely eradicate these species. It would be cost prohibitive to eliminate these species; however, steps can be taken to minimize the introduction and spread of invasive species.

4. Policy. Contracting agents will insert specifications into contracts requiring landscaping vendors to provide nursery stock that is nursery - certified to be free from

insects, invasive plants, and their seeds. Contracting agents include all personnel responsible for the procurement of landscaping goods and services who are responsible for the development of scopes of work, performance work statements, etc., or the direct purchase of landscaping materials (i.e., credit card purchases). A standard contract statement is inserted for inclusion in all procurement documents (including credit card and purchases). Copies of this certification must accompany shipping manifests of nursery stock and the agent will require copies per the contract prior to the commencement of planting. IMPAC cardholders purchasing landscaping services or nursery stock will also require a copy of the certification from the vendor prior to planting.

a. The Imported Red Fire Ant has been introduced into Virginia from nursery stock transported from Red Fire Ant quarantine states. The U. S. Department of Agriculture has signed compliance agreements with nurseries working in these states. Nursery stock or materials originating from the following states are required to have an Imported Red Fire Ant – free certificate attached to the shipping manifest: Georgia, Florida, North Carolina, Texas, Mississippi, Alabama, Louisiana, South Carolina, Tennessee, Arkansas, and Oklahoma. If the certificate is absent do not accept shipment of these materials.

b. Land management equipment operating in known areas of infestation will be thoroughly cleaned at a designated wash down site prior to relocating to uninfested areas. This requirement applies to equipment operated by DoD employees as well as contractors and vendors.

c. Whenever possible, native plant species grown from local stock should be used for conservation and landscaping purposes. There is an abundant variety of indigenous species available and they are usually less expensive.

d. DEL Natural Resources staff will regulate water levels in the Impact Area waterfowl impoundment at appropriate intervals to control the establishment of aquatic invasive species.

e. DEL Natural Resources staff will conduct an ongoing surveillance program to monitor the development of known infestations, control their spread, and be on the alert for new infestations. Funding permitting, the staff will reduce the invasive species population on Fort Lee.

3. **Effective Date.** This policy is effective on the above-mentioned date of this memorandum.

4. **Proponent.** Proponent for this policy is DEL's Environmental Management Office, extension 45061.

Billy K. Solomon (signed)
BILLY K. SOLOMON
Lieutenant General, US Army
Commanding

ATTACHMENT 8
Roof Warranty

CONTRACTOR'S TEN (10) YEAR NO PENAL SUM WARRANTY
FOR
METAL ROOF SYSTEM

FACILITY DESCRIPTION:_____

BUILDING NUMBER:_____

CORPS OF ENGINEERS CONTRACT NUMBER:_____

CONTRACTOR

CONTRACTOR:_____

ADDRESS:_____

POINT OF CONTACT:_____

TELEPHONE NUMBER:_____

ROOF MANUFACTURER

MANUFACTURER:_____

NAME OF ROOF SYSTEM:_____

ADDRESS:_____

POINT OF CONTACT:_____

TELEPHONE NUMBER:_____

OWNER

OWNER:_____

ADDRESS:_____

POINT OF CONTACT:_____

TELEPHONE NUMBER:_____

CONSTRUCTION AGENT

CONSTRUCTION AGENT:_____

ADDRESS:_____

POINT OF CONTACT:_____

TELEPHONE NUMBER:_____

CONTRACTOR'S FIVE (10) YEAR NO PENAL SUM WARRANTY
FOR
METAL ROOF SYSTEM
(continued)

THE METAL ROOF SYSTEM INSTALLED ON THE ABOVE NAMED BUILDING IS WARRANTED BY _____ FOR A PERIOD OF TEN (10) YEARS AGAINST WORKMANSHIP AND MATERIAL DEFICIENCIES, WIND DAMAGE, STRUCTURAL FAILURE, AND LEAKAGE. THE METAL ROOFING SYSTEM COVERED UNDER THIS WARRANTY SHALL INCLUDE, BUT SHALL NOT BE LIMITED TO, THE FOLLOWING: THE ENTIRE ROOFING SYSTEM, MANUFACTURER SUPPLIED FRAMING AND STRUCTURAL MEMBERS, METAL ROOF PANELS, FASTENERS, CONNECTORS, ROOF SECUREMENT COMPONENTS, AND ASSEMBLIES TESTED AND APPROVED IN ACCORDANCE WITH UL 580. IN ADDITION, THE SYSTEM PANEL FINISHES, SLIP SHEET, INSULATION, VAPOR RETARDER, ALL ACCESSORIES, COMPONENTS, AND TRIM AND ALL CONNECTIONS ARE INCLUDED. THIS INCLUDES ROOF PENETRATION ITEMS SUCH AS VENTS, CURBS, SKYLIGHTS; INTERIOR OR EXTERIOR GUTTERS AND DOWNSPOUTS; EAVES, RIDGE, HIP, VALLEY, RAKE, GABLE, WALL, OR OTHER ROOF SYSTEM FLASHINGS INSTALLED AND ANY OTHER COMPONENTS SPECIFIED WITHIN THIS CONTRACT TO PROVIDE A WEATHERTIGHT ROOF SYSTEM; AND ITEMS SPECIFIED IN OTHER SECTIONS OF THE SPECIFICATIONS THAT ARE PART OF THE METAL ROOFING SYSTEM.

ALL MATERIAL DEFICIENCIES, WIND DAMAGE, STRUCTURAL FAILURE, AND LEAKAGE ASSOCIATED WITH THE METAL ROOF SYSTEM COVERED UNDER THIS WARRANTY SHALL BE REPAIRED AS APPROVED BY THE CONTRACTING OFFICER. THIS WARRANTY SHALL COVER THE ENTIRE COST OF REPAIR OR REPLACEMENT, INCLUDING ALL MATERIAL, LABOR, AND RELATED MARKUPS. THE ABOVE REFERENCED WARRANTY COMMENCED ON THE DATE OF FINAL ACCEPTANCE ON _____ AND WILL REMAIN IN EFFECT FOR STATED DURATION FROM THIS DATE.

SIGNED, DATED, AND NOTARIZED (BY COMPANY PRESIDENT)

_____

(Company President) (Date)

CONTRACTOR'S FIVE (10) YEAR NO PENAL SUM WARRANTY
FOR
METAL ROOFING SYSTEM
(continued)

THIS CONTRACTOR SHALL SUPPLEMENT THIS WARRANTY WITH WRITTEN WARRANTIES FROM THE MANUFACTURER AND/OR INSTALLER OF THE METAL ROOFING SYSTEM, WHICH SHALL BE SUBMITTED ALONG WITH THE CONTRACTOR'S WARRANTY. HOWEVER, THE CONTRACTOR WILL BE ULTIMATELY RESPONSIBLE FOR THIS WARRANTY AS OUTLINED IN THE SPECIFICATIONS AND AS INDICATED IN THIS WARRANTY EXAMPLE.

EXCLUSIONS FROM COVERAGE

1. NATURAL DISASTERS, ACTS OF GOD (LIGHTNING, FIRE, EXPLOSIONS, SUSTAINED WIND FORCES IN EXCESS OF THE DESIGN CRITERIA, EARTHQUAKES, AND HAIL).

2. ACTS OF NEGLIGENCE OR ABUSE OR MISUSE BY GOVERNMENT OR OTHER PERSONNEL, INCLUDING ACCIDENTS, VANDALISM, CIVIL DISOBEDIENCE, WAR, OR DAMAGE CAUSED BY FALLING OBJECTS.

3. DAMAGE BY STRUCTURAL FAILURE, SETTLEMENT, MOVEMENT, DISTORTION, WARPAGE, OR DISPLACEMENT OF THE BUILDING STRUCTURE OR ALTERATIONS MADE TO THE BUILDING.

4. CORROSION CAUSED BY EXPOSURE TO CORROSIVE CHEMICALS, ASH OR FUMES GENERATED OR RELEASED INSIDE OR OUTSIDE THE BUILDING FROM CHEMICAL PLANTS, FOUNDRIES, PLATING WORKS, KILNS, FERTILIZER FACTORIES, PAPER PLANTS, AND THE LIKE.

5. FAILURE OF ANY PART OF THE METAL ROOF DUE TO ACTIONS BY THE OWNER TO INHIBIT FREE DRAINAGE OF WATER FROM THE ROOF AND GUTTERS AND DOWNSPOUTS OR ALLOW PONDING WATER TO COLLECT ON THE ROOF SURFACE. CONTRACTOR'S DESIGN SHALL INSURE FREE DRAINAGE FROM THE ROOF AND NOT ALLOW PONDING WATER.

6. THIS WARRANTY APPLIES TO THE METAL ROOFING SYSTEM. IT DOES NOT INCLUDE ANY CONSEQUENTIAL DAMAGE TO THE BUILDING INTERIOR OR CONTENTS, WHICH IS COVERED BY THE WARRANTY OF CONSTRUCTION CLAUSE INCLUDED IN THIS CONTRACT.

7. THIS WARRANTY CANNOT BE TRANSFERRED TO ANOTHER OWNER WITHOUT WRITTEN CONSENT OF THE CONTRACTOR; AND THIS WARRANTY AND THE CONTRACT PROVISIONS WILL TAKE PRECEDENCE OVER ANY CONFLICTS WITH STATE STATUES.

CONTRACTOR'S FIVE (10) YEAR NO PENAL SUM WARRANTY
FOR
METAL ROOF SYSTEM
(continued)

**REPORTS OF LEAKS AND ROOF SYSTEM DEFICIENCIES SHALL BE RESPONDED TO WITHIN 48 HOURS OF RECEIPT OF NOTICE, BY TELEPHONE OR IN WRITING, FROM EITHER THE OWNER OR CONTRACTING OFFICER. EMERGENCY REPAIRS TO PREVENT FURTHER ROOF LEAKS SHALL BE INITIATED IMMEDIATELY; A WRITTEN PLAN SHALL BE SUBMITTED FOR APPROVAL TO REPAIR OR REPLACE THIS ROOF SYSTEM WITHIN SEVEN (7) CALENDAR DAYS. ACTUAL WORK FOR PERMANENT REPAIRS OR REPLACEMENT SHALL BE STARTED WITHIN 30 DAYS AFTER RECEIPT OF NOTICE, AND COMPLETED WITHIN A REASONABLE TIME FRAME. IF THE CONTRACTOR FAILS TO ADEQUATELY RESPOND TO THE WARRANTY PROVISIONS, AS STATED IN THE CONTRACT AND AS CONTAINED HEREIN, THE CONTRACTING OFFICER MAY HAVE THE METAL ROOF SYSTEM REPAIRED OR REPLACED BY OTHERS AND CHARGE THE COST TO THE CONTRACTOR.

IN THE EVENT THE CONTRACTOR DISPUTES THE EXISTENCE OF A WARRANTABLE DEFECT, THE CONTRACTOR MAY CHALLENGE THE OWNER'S DEMAND FOR REPAIRS AND/OR REPLACEMENT DIRECTED BY THE OWNER OR CONTRACTING OFFICER EITHER BY REQUESTING A CONTRACTING OFFICER'S DECISION UNDER THE CONTRACT DISPUTES ACT, OR BY REQUESTING THAT AN ARBITRATOR RESOLVE THE ISSUE. THE REQUEST FOR AN ARBITRATOR MUST BE MADE WITHIN 48 HOURS OF BEING NOTIFIED OF THE DISPUTED DEFECTS. UPON BEING INVOKED, THE PARTIES SHALL, WITHIN TEN (10) DAYS, JOINTLY REQUEST A LIST OF FIVE (5) ARBITRATORS FROM THE FEDERAL MEDIATION AND CONCILIATION SERVICE. THE PARTIES SHALL CONFER WITHIN TEN (10) DAYS AFTER RECEIPT OF THE LIST TO SEEK AGREEMENT ON AN ARBITRATOR. IF THE PARTIES CANNOT AGREE ON AN ARBITRATOR, THE CONTRACTING OFFICER AND THE PRESIDENT OF THE CONTRACTOR'S COMPANY WILL STRIKE ONE (1) NAME FROM THE LIST ALTERNATIVELY UNTIL ONE (1) NAME REMAINS. THE REMAINING PERSON SHALL BE THE DULY SELECTED ARBITRATOR. THE COSTS OF THE ARBITRATION, INCLUDING THE ARBITRATOR'S FEE AND EXPENSES, COURT REPORTER, COURTROOM OR SITE SELECTED, ETC., SHALL BE BORNE EQUALLY BETWEEN THE PARTIES. EITHER PARTY DESIRING A COPY OF THE TRANSCRIPT SHALL PAY FOR THE TRANSCRIPT. A HEARING WILL BE HELD AS SOON AS THE PARTIES CAN MUTUALLY AGREE. A WRITTEN ARBITRATOR'S DECISION WILL BE REQUESTED NOT LATER THAN 30 DAYS FOLLOWING THE HEARING. THE DECISION OF THE ARBITRATOR WILL NOT BE BINDING; HOWEVER, IT WILL BE ADMISSIBLE IN ANY SUBSEQUENT APPEAL UNDER THE CONTRACT DISPUTES ACT.

A FRAMED COPY OF THIS WARRANTY SHALL BE POSTED IN THE MECHANICAL ROOM OR OTHER APPROVED LOCATION DURING THE ENTIRE WARRANTY PERIOD.

-- End --

ATTACHMENT 9
Stormwater Package

SITE-SPECIFIC STORMWATER PACKAGE

This package contains the following:

- Site-Specific Stormwater Pollution Plan Requirements
- Construction Contractor Certification
- Information Checklist for SP3
- Blank Site-Specific SP3 for use as an example or template
- Construction Site Stormwater Inspection Form
- Copy Available from EMO

Provide to Fort Lee Environmental Management Office (EMO) prior to Construction
The plan must be approved by EMO:

- Site-specific Stormwater Pollution Prevention Plan
- Signed Construction Contractor Certification

Inspection forms must be maintained by contractor or project manager and copy provided to EMO Personnel.

EMO point of contact is Bill Vaughn at 734-3560 or scholle@lee.army.mil

SITE-SPECIFIC STORMWATER POLLUTION PREVENTION PLAN REQUIREMENTS

Each construction activity at Fort Lee is required to have a site-specific Stormwater Pollution Plan (SP3). The SP3 will be generated by the construction contractor and submitted to the site's Construction/Project Manager and the EMO for review and approval. The initial site specific SP3 and all modifications including a signature page with the name of the person responsible for preparing the site-specific SP3 will be kept on file in EMO. The site-specific SP3 shall include the following information:

- Site Description
- Site Map
- Types of Controls
- Non-Stormwater Management
- Post-Construction Stormwater Management
- Waste Management and Disposal
- Maintenance, Inspection, and Repair Procedures
- Identification of Contractors, Subcontractors, and their tasks
- Monitoring and Reporting
- Certification

The key elements of the site-specific SP3 are the site description and the site map (Construction plan). The site map will include details of areas ¼ mile beyond the construction site boundaries and will provide the following information:

- Lateral limits of the construction site
- Surface water bodies, including known springs and wetlands
- Areas of soils to be disturbed
- Locations of controls to be used during construction
- Locations of stormwater management controls to be used post-construction
- Outline of off-site drainage areas that discharge into the construction site
- General topography
- Anticipated discharge location(s) where the construction site's stormwater discharges tot he installation's stormwater drainage system or other water body.

Descriptions of on-site sources shall be provided with the site-specific maps and shall outline proposed and proper on-site practices. Examples of these descriptions shall include the following:

- List of toxic materials that are known to have been treated, stored, disposed, spilled, or leaked in significant quantities (estimated volumes also to be listed) onto the construction site.
- Stormwater control practices for construction materials, equipment, and vehicles.
- Construction material loading, unloading, and access areas
- Equipment storage, cleaning, and maintenance areas.

A site-specific SP3 should not be limited to the above information. The requirements outlined above are the minimum requirements to satisfy Fort Lee's VPDES permit for stormwater discharges associated with construction activity; however, additional information not outlined above, but relevant to site-specific stormwater issues should be included with the site-specific SP3 for that construction site. References include EPA's Stormwater Management for Construction Activities – Developing Pollution Prevention Plans and Best Management Practices (EPA 833-R-92-001, October 1992), and Virginia's VR 680-14-19 VPDES General Permit Regulation for Stormwater Discharges from Construction Sites.

The Engineer responsible for reviewing the site-specific SP3 shall use the checklist provided to ensure that the necessary information is compiled for the plan. If additional information is required, the Engineer can request additional information from the Contractor or use the following supplemental sources:

- United States Geological Survey: For general topographic information and for locations of waterways receiving runoff from each project site.
- Natural Resources Conservation Service: For general soil information, including surface soil erosion potential.
- National Wetlands Inventory Maps: For general locations of documented sensitive wetland areas.
- Federal Emergency Management Agency: For floodplain map data indicating the extent of building restriction lines without flood protection.
- Previous in-house construction project data (if available): For geotechnical boring logs, slope stability studies for site grading, retaining walls, stream channel protection, storm or surface water sampling data, and aerial photography indicating locations of grasslands, woodlands, and unstable slopes.
- Virginia Sediment and Erosion Control Handbook

FORT LEE, VA
CONSTRUCTION CONTRACTOR CERTIFICATION

I certify, under penalty of law, that I have read and understand the terms and conditions of the general Virginia Pollutant Discharge elimination System (VPDES) permit that authorizes the stormwater discharges associated with the construction activity from the Fort Lee construction site and the Stormwater Pollution Prevention Plan (SP3) associated and identified as part of this certification.

Duty or Responsibility: _____

Contractor:

Name: _____

Mailing Address: _____

City: _____ State: _____ Zip Code: _____

Phone: _____

Authorized Signature

Print Name: _____

Signature: _____

Title: _____

Date: _____

INFORMATION CHECKLIST FOR CONSTRUCTION SP3S

Site Description

- ☐ Description of project purpose
- ☐ Schedule of major soil disturbing activities
- ☐ Soil disturbances necessary to complete the project
  - ☐ Soil Excavation ☐ Grading ☐ Clearing
  - ☐ Soil Stockpiling ☐ Demolition ☐ Preparation for planting
  - ☐ Other(s) _____
- ☐ Estimate the size of the project site and the area to be disturbed
- ☐ Calculate the runoff coefficient for the site (before and after construction)
- ☐ Description of existing vegetation at the site
- ☐ Description of other potential pollution sources, including vehicle fueling, chemical storage, sanitary facilities, etc.
- ☐ Name of surface water body receiving runoff from the project site
- ☐ Pollution prevention site map
  - ☐ Drainage patterns and slopes/contours after grading
  - ☐ Areas of soil disturbance
  - ☐ Location of major structural and nonstructural controls identified under "Controls"
  - ☐ Location of areas requiring stabilization practices, including types of cover
  - ☐ Surface waters, including wetlands
  - ☐ Location of surface runoff discharge points and drainage areas
  - ☐ Existing and planned paved areas and buildings
  - ☐ Locations of permanent stormwater management practices
- ☐ Locations of other potential pollution sources

Controls

Description of applicable controls

- ☐ Erosion and Sediment Controls
  - ☐ Stabilization Practices
  - ☐ Structural Practices
- ☐ Stormwater Management
- ☐ Other Controls

Maintenance

- ☐ Description and schedule of maintenance procedures

Inspections

- ☐ At least once every 14 calendar days and within 48 hours of the end of a storm event that is 0.5 inches or greater. Where areas have been finally or temporarily stabilized or runoff is unlikely due to winter conditions (e.g., site is covered with snow, ice, or frozen ground exists) such inspections shall be conducted at least once every month.
- ☐ Inspection of disturbed areas, erosion and sediment control structures/practices, and exposed material storage areas
- ☐ Updates to SP3 based on inspections, if appropriate (within 7 days)
- ☐ Inspection reporting

Non Stormwater Discharges

- ☐ Identify all NSDs (except fire fighting flows)

Certifications

- ☐ Identify each measure and contractor/subcontractor responsible for implementation
- ☐ Certification statement signed by each identified contractor/subcontractor

SITE SPECIFIC STORMWATER POLLUTION PREVENTION PLAN

SITE DESCRIPTION

Project Name & Location:

Owner Name & Address: Commander, Fort Lee, VA
Directorate of Public Works
1816 Shop Road
Fort Lee VA 2380

Description of Purpose of Project:

Runoff Coefficient
Before construction:

After Construction: (Rational Method)

Total Area of Construction Site: _____Acres
Estimated Area of Soils to be disturbed: Acres

Name(s) of Receiving Water(s):

SITE MAP

The following items are included on the site map (Appendix A). The list is presented in checklist form, with the plate number on which item can be found.

Plate No.___

- ☐ Drainage patterns and estimated slopes/contours after grading.
- ☐ Areas of soil disturbance.
- ☐ Locations of major structural and nonstructural controls.
- ☐ Locations of areas requiring stabilization practices, including types of cover.
- ☐ Surface waters, including wetlands.
- ☐ Locations of surface runoff discharge points and associated drainage areas.
- ☐ Existing and planned paved areas and buildings.
- ☐ Locations of permanent stormwater management practices.
- ☐ Locations of other potential pollution sources.

POTENTIAL SOURCES

The following is a list of potential sources of stormwater pollution expected at Fort Lee construction sites. A check is placed next to all sources that apply to this particular construction site and activity. A blank has been provided at the end of the list for any additional potential sources.

Construction Activities

- ☐ Vegetation clearing
- ☐ Soil stockpiling
- ☐ Other: _____
- ☐ Excavations
- ☐ Grading

Other Sources

- ☐ Vehicle fueling
- ☐ Hazardous materials storage
- ☐ Solid waste storage
- ☐ Building materials (please specify):
- ☐ Other: _____
- ☐ Stockpiled gravel or asphalt
- ☐ Sanitary waste facilities

CONTROLS

The following is a che3cklist of control measures that are expected to be implemented during the course of this project. Other measures, not included on the list, are provided in the planks provided.

Erosion and Sediment Controls

Stabilization Practices

- ☐ Temporary Seeding
- ☐ Mulching
- ☐ Sod stabilization
- ☐ Protection of trees
- ☐ Other: _____
- ☐ Other: _____
- ☐ Permanent seeding
- ☐ Geotextiles
- ☐ Vegetative buffer strips
- ☐ Preservation of mature vegetation

Structural Controls

- ☐ Silt fencing
- ☐ Drainage swales
- ☐ Sediment basin(s)
- ☐ Subsurface drains
- ☐ Storm drain inlet protection
- ☐ Other: _____
- ☐ Earthen dikes
- ☐ Sediment traps
- ☐ Check dams
- ☐ Pipe slope drains
- ☐ Rock outlet protection

Stormwater Management

The following measures will be installed during the construction process to control pollutants in stormwater discharges that may occur after construction is completed.

- ☐ Stormwater detention ponds or other detention structures
- ☐ Stormwater retention ponds or other retention structures
- ☐ Flow attenuation by use of open vegetated swales and natural depressions
- ☐ Infiltration of runoff on site
- ☐ Sequential systems (combination of several practices)
- ☐ Velocity dissipation device at discharge locations to provide a non-erosive flow velocity
- ☐ Other: _____

Other Controls

Other types of controls not related to sediment and erosion control will be implemented during the course of the construction activity. All that apply are indicated.

Solid Wastes

- ☐ Place in closed dumpsters
- ☐ Place in trashcans with lids
- ☐ Other: _____

Hazardous Wastes

- ☐ Placed in closed, EPA/DOT- approved containers
- ☐ Stored in covered area (tarp, portable shed, lean-to)
- ☐ Placed within a bermed storage area
- ☐ Other: _____

Sanitary Waste

- ☐ Portable facilities that are closed and covered will be used
- ☐ Facilities in area where it is unlikely to be damaged or disturbed by heavy equipment.
- ☐ Other: _____

Raw Material Storage Areas

- ☐ Kept in closed, EPA/DOT – approved containers
- ☐ Stored in a covered material storage area (tarp, portable shed, lean-to)
- ☐ Kept within a bermed storage area
- ☐ Other: _____

5.0 TIMING OF ACTIVITIES AND CONTROLS

The following is a written description of soil-disturbing activities and controls, and in what sequence these activities will occur. Locations, areas(s) involved, and types of controls for each activity are described in the order they are expected to occur.

INSPECTIONS AND MAINTENANCE

Contractors will follow, at a minimum, the inspection and maintenance procedures outlined in Section 3.5 of Fort Lee's General SWP3 for Construction Activities. These procedures include inspections every 7 calendar days and within 24 hours of a 0.5-inch or more precipitation event. Any deviations from these procedures, including more stringent inspection and maintenance procedures, are provided below:

IDENTIFICIATIONOF NON-STORMWATER DISCHARGES

All non-stormwater discharges (NSDs) associated with construction activities that are planned or expected to occur during this construction activity are listed below:

- ☐ Discharges from fire fighting activities
- ☐ Fire hydrant flushing
- ☐ Water used to wash vehicles (no detergents) or control dust
- ☐ Air conditioning condensate
- ☐ Uncontaminated groundwater, including foundation or footing drains
- ☐ Pavement wash waters, where spills or leaks of toxic or hazardous materials have not occurred and where detergents are not used
- ☐ Potable water sources, including: water line flushing; irrigation drainage; lawn watering; and routine external building wash down that does not use detergents

MATERIAL INVENTORY

The following materials are expected to be on-site during the construction activities:

Construction materials

- ☐ Bags of cement and other dry materials
- ☐ Asphalt
- ☐ Tar
- ☐ Other: _____
- ☐ Drywall
- ☐ Metals

Hazardous materials

- ☐ Solvents
- ☐ Paints
- ☐ Pesticides/herbicides
- ☐ Other: _____
- ☐ Compressed gas cylinders
- ☐ Fertilizers
- ☐ Cleaners/detergents

Equipment maintenance materials

- ☐ Fuel
- ☐ Motor oil, grease
- ☐ Hydraulic fluids
- ☐ Other: _____
- ☐ Antifreeze
- ☐ Transmission fluid

Other materials not listed above

- ☐ Other:

GOOD HOUSEKEEPING

Contractors will follow, at a minimum, the good housekeeping procedures outlined in Section 3.2.3 of Fort Lee's General SWP3 for Construction Activities. Any expected deviations from these procedures are provided below:

SPILL PREVENTION

Contractors will follow, at a minimum, the spill prevention procedures outlined in Section 3.2.3 of Fort Lee's General SWP3 for Construction Activities. Any expected deviations form these procedures are provided below:

Are materials expected to be on-site that can spill or leak (e.g. fuel, oils, pints)?
☐ Yes ☐ No

Will a spill response kit be maintained on site?
☐ Yes ☐ No

CERTIFICATION

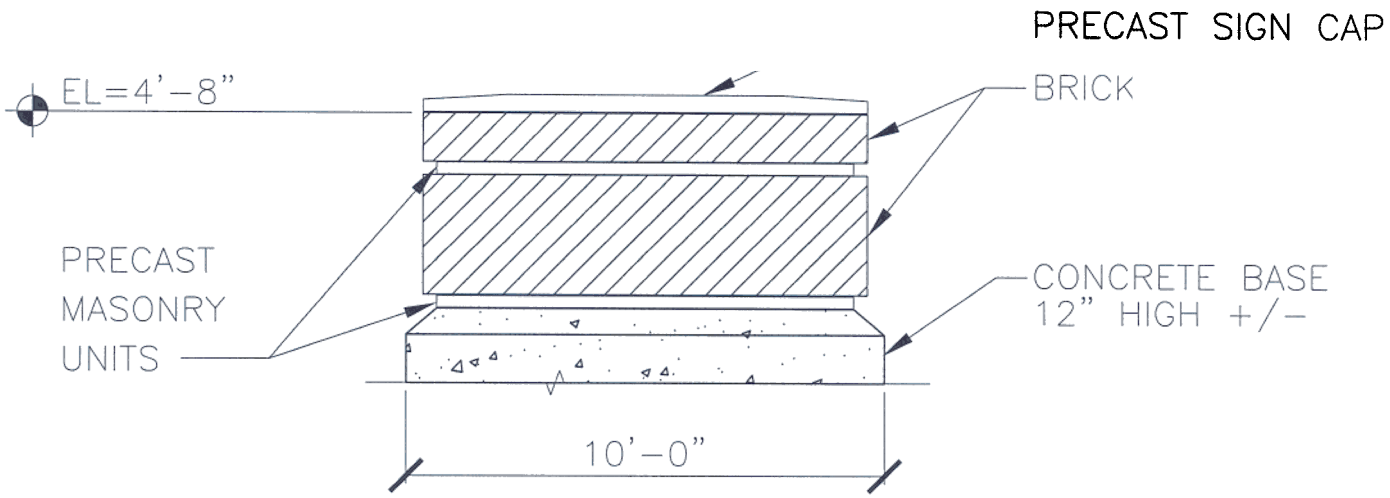
A signed copy of installation certification for this construction project is found in Appendix B.

CONTRACTOR'S CERTIFICATION

All contractors with responsibilities related to preventing stormwater pollution have signed certification forms provided in Appendix C.

ATTACHMENT 10
Exterior Sign

EXTERIOR SIGN:
Ft. Lee - Fire & Emergency Services Center (Phase I & II)



The exterior identification sign shall be similar to above sketch. Construction shall be masonry. Letters shall be dimensional cast aluminum or off-white cream. Lettering shall be on both sides of the sign. Sign shall include the name of the facility and the address. A painted metal or precast concrete logo shall be included. The sign shall be lighted by in-ground, flush mounted lights. Reveal edge shall be precast masonry units. Concrete bevel-edge base shall be per Installation Design Guide.

ATTACHMENT 11

Anti-Terrorism Force Protection Criteria

UFC 4-010-01
31 July 2002

UNIFIED FACILITIES CRITERIA (UFC)

DoD MINIMUM ANTITERRORISM STANDARDS FOR BUILDINGS

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UNIFIED FACILITIES CRITERIA (UFC)

DoD MINIMUM ANTITERRORISM STANDARDS FOR BUILDINGS

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UNDER SECRETARY OF DEFENSE (ACQUISITION, TECHNOLOGY, AND LOGISTICS) (Preparing Activity)

J3, DEPUTY DIRECTORATE FOR ANTITERRORISM AND FORCE PROTECTION, JOINT CHIEFS OF STAFF

U.S. ARMY CORPS OF ENGINEERS

NAVAL FACILITIES ENGINEERING COMMAND

AIR FORCE CIVIL ENGINEER SUPPORT AGENCY

Record of Changes (changes are indicated by **1**\ ... /**1**/)

Change No.	Date	Location

This UFC supersedes Interim Department of Defense Antiterrorism / Force Protection Construction Standards of 16 December 1999, except that the Interim Standard will remain in effect for fiscal year 2002 and 2003 Military Construction Programs.

FOREWORD

The Unified Facilities Criteria (UFC) system is prescribed by MIL-STD 3007 and provides planning, design, construction, sustainment, restoration, and modernization criteria, and applies to the Military Departments, the Defense Agencies, and the DoD Field Activities in accordance with USD(AT&L) Memorandum dated 29 May 2002. UFC will be used for all DoD projects and work for other customers where appropriate.

UFC are living documents and will be periodically reviewed, updated, and made available to users as part of the Services' responsibility for providing technical criteria for military construction. Headquarters, U.S. Army Corps of Engineers (HQUSACE), Naval Facilities Engineering Command (NAVFAC), and Air Force Civil Engineer Support Agency (AFCESA) are responsible for administration of the UFC system. Defense agencies should contact the preparing service for document interpretation and improvements. Technical content of UFC is the responsibility of the cognizant DoD working group. Recommended changes with supporting rationale should be sent to the respective service proponent office by the following electronic form: Criteria Change Request (CCR). The form is also accessible from the Internet sites listed below.

UFC are effective upon issuance and are distributed only in electronic media from the following sources:

- Unified Facilities Criteria (UFC) Index http://65.204.17.188//report/doc_ufc.html.
- USACE TECHINFO Internet site http://www.hnd.usace.army.mil/techinfo .
- NAVFAC Engineering Innovation and Criteria Office Internet site http://criteria.navfac.navy.mil.
- Construction Criteria Base (CCB) system maintained by the National Institute of Building Sciences at Internet site http://www.ccb.org .

Hard copies of UFC printed from electronic media should be checked against the current electronic version prior to use to ensure that they are current.

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FOREWORD (continued)

This specific document is also issued under the authority of DoD Instruction Number 2000.16, *DoD Antiterrorism Standards* which requires DoD Components to adopt and adhere to common criteria and minimum construction standards to mitigate antiterrorism vulnerabilities and terrorist threats.

This document applies to the Office of the Secretary of Defense (OSD); the Military Departments (including their National Guard and Reserve Components); the Chairman, Joint Chiefs of Staff and Joint Staff; the Combatant Commands; the Office of the Inspector General of the Department of Defense; the Defense Agencies; the Department of Defense Field Activities; and all other organizational entities within the Department of Defense hereafter referred to collectively as “the DoD Components.”

The standards established by this document are minimums set for DoD. Each DoD Component may set more stringent antiterrorism building standards to meet the specific threats in its area of responsibility.

Any changes, updates, or amendments to this particular UFC must have the approval of the DoD Engineering Senior Executive Panel (ESEP).

This document is effective immediately and is mandatory for use by all the DoD Components.

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CHAPTER 1

INTRODUCTION

1-1 **GENERAL.** This document represents a significant commitment by DoD to seek effective ways to minimize the likelihood of mass casualties from terrorist attacks against DoD personnel in the buildings in which they work and live.

1-1.1 **Dynamic Threat Environment.** Terrorism is real, evolving, and continues to increase in frequency and lethality throughout the world. The unyielding, tenacious, and patient nature of the terrorists targeting DoD interests forces us to closely examine existing policies and practices for deterring, disrupting, and mitigating potential attacks. Today, terrorist attacks can impact anyone, at any time, at any location, and can take many forms. Deterrence against terrorist attacks begins with properly trained and equipped DoD personnel employing effective procedures. While terrorists have many tactics available to them, they frequently use explosive devices when they target large numbers of DoD personnel. Most existing DoD buildings offer little protection from terrorist attacks. By applying the Minimum Antiterrorism Standards for Buildings described in this document, we become a lesser target of opportunity for terrorists.

1-1.2 **Responsibility.** Protecting people on a DoD installation or site must start with an understanding of the risk of a terrorist attack. Application of the standards herein should be consistent with the perceived or identified risk. Everyone in DoD is responsible for protecting our people and other resources.

1-1.2.1 **Individuals.** Each DoD employee, contractor, or vendor is responsible for minimizing opportunities for terrorists to threaten or target themselves, their co-workers, and their families on DoD installations or sites.

1-1.2.2 **Installation Commanders.** The installation commander must protect the people on his/her installation, or site, by managing and mitigating the risk to those people in the event of a terrorist attack. The installation commander is responsible for applying the standards herein, consistent with the identified or perceived risk of DoD people being hurt or killed.

1-1.2.3 **Service Secretaries and Agency Heads.** The heads of DoD Components shall ensure compliance and issue guidance to implement these standards. That guidance will include direction to require the installation commander to notify or seek approval from a major command or claimant or higher headquarters level if a new construction or renovation project, or a leased facility, will not meet any one or more of the standards. Heads of DoD Components will establish plans and procedures to mitigate risks in such situations.

1-1.3 **Planning and Integration.** When the best procedures, proper training, and appropriate equipment fail to deter terrorist attacks, adherence to these standards goes far in mitigating the possibility of mass casualties from terrorist attacks against DoD personnel in the buildings in which they work and live. Although predicting the specific threat to everyone is not possible, proper planning and integration of those plans provides a solid foundation for preventing, and if necessary reacting, when

terrorist incidents or other emergencies unfold. An effective planning process facilitates the necessary decision making, clarifies roles and responsibilities, and ensures support actions generally go as planned. A team consisting of the chain of command and key personnel from all appropriate functional areas who have an interest in the building and its operation executes this planning process. The team should include, as a minimum, antiterrorism/force protection, intelligence, security, and facility engineering personnel. This team is responsible for identifying requirements for the project, facilitating the development of supporting operational procedures, obtaining adequate resources, and properly supporting all other efforts needed to prudently enhance protection of the occupants of every inhabited DoD building. For further information on planning and integration, refer to the *DoD Security Engineering Manual*.

1-2 **REFERENCES.**

- Interim Department of Defense Antiterrorism / Force Protection Construction Standards, December 16, 1999 (hereby cancelled)
- DoD Instruction 2000.16, DoD Antiterrorism Standards, June 14, 2001.
- DoD Handbook 2000.12-H, Protection of DoD Personnel and Activities Against Acts of Terrorism and Political Turbulence, February 1993
- American Society of Civil Engineers Standard (ANSI/ASCE) 7-98, Minimum Design Loads for Buildings and Other Structures, January 2000
- Unified Facilities Criteria (UFC) 4-010-02, *DoD Security Engineering Manual*, (Draft)
- Unified Facilities Criteria (UFC) 4-010-10, *DoD Minimum Antiterrorism Standoff Distances for Buildings; (For Official Use Only (FOUO))*
- Sections 2805(a)(1) and 2805(c)(1) of Title 10, US Code
- Security Engineering Working Group web site (http://sewg.nwo.usace.army.mil)
- DoD 6055.9-STD, DoD Ammunition and Explosive Safety Standards, July 1999

1-3 **STANDARDS AND RECOMMENDATIONS.** Mandatory DoD minimum antiterrorism standards for new and existing inhabited buildings are contained in Appendix B. Additional recommended measures for new and existing inhabited buildings are included in Appendix C. Mandatory DoD minimum antiterrorism standards for expeditionary and temporary structures are contained in Appendix D.

1-4 **INTENT.** The intent of these standards is to minimize the possibility of mass casualties in buildings or portions of buildings owned, leased, privatized, or otherwise occupied, managed, or controlled by or for DoD. These standards provide appropriate, implementable, and enforceable measures to establish a level of protection

against terrorist attacks for all inhabited DoD buildings where no known threat of terrorist activity currently exists. While complete protection against all potential threats for every inhabited building is cost prohibitive, the intent of these standards can be achieved through prudent master planning, real estate acquisition, and design and construction practices. Where the minimum standoff distances detailed in these standards are met, most conventional construction techniques can be used with only marginal impact on the total construction or renovation cost. The financial impact of these standards will be significantly less than the economic and intangible costs of a mass casualty event.

1-5 **LEVELS OF PROTECTION.** The levels of protection provided by these standards meet the intent described above and establish a foundation for the rapid application of additional protective measures in a higher threat environment. These standards may be supplemented where specific terrorist threats are identified, where more stringent local standards apply, or where local commanders dictate additional measures. Detailed descriptions of the levels of protection are provided in Chapter 2 and the *DoD Security Engineering Manual*.

1-5.1 **DoD Component Standards.** Where DoD Component standards such as geographic Combatant Commander standards address unique requirements, those standards will be incorporated in accordance with their implementing directives, but not to the exclusion of these standards.

1-5.2 **Threat-Specific Requirements.** Where a design basis threat is identified whose mitigation requires protective measures beyond those required by these standards or DoD Component standards, those measures will be developed in accordance with the provisions of the *DoD Security Engineering Manual*. The provisions of the *DoD Security Engineering Manual* include the design criteria that will be the basis for the development of the protective measures, estimates of the costs of those measures, and detailed guidance for developing the measures required to mitigate the identified threat. The design criteria include the assets to be protected, the threat to those assets, and the desired level of protection. Use of the *DoD Security Engineering Manual* will ensure uniform application, development, and cost estimation of protective measures throughout DoD.

1-5.3 **Critical Facilities.** Buildings that must remain mission operational during periods of national crisis and/or if subjected to terrorist attack should be designed to significantly higher levels of protection than those provided by these standards.

1-5.4 **Explosive Safety Standards.** These antiterrorism standards establish criteria to minimize the potential for mass casualties and progressive collapse from a terrorist attack. DoD 6055.9-STD, *DoD Ammunition and Explosive Safety Standards* as implemented by Service component explosive safety standards, establish acceptable levels of protection for accidental explosions of DoD-titled munitions. The explosive safety and antiterrorism standards address hazards associated with unique events; therefore, they specify different levels of protection. Compliance with both standards is required. Where conflicts arise, the more stringent criteria will govern.

1-6 **APPLICABILITY.** These standards apply to all DoD Components, to all DoD inhabited buildings, and to all DoD expeditionary and temporary structures in accordance with the following:

1-6.1 **New Construction.** Implementation of these standards is mandatory for all new construction regardless of funding source in accordance with the following:

1-6.1.1 **Military Construction (MILCON).** These standards apply to MILCON projects starting with the Fiscal Year 2004 Program. Projects programmed or designed under the Interim DoD Antiterrorism / Force Protection Construction Standards do not have to be reprogrammed or redesigned to meet the requirements of these standards. The provisions of the Interim Standards will apply to those projects. Due to minor changes between these standards and the Interim Standards, projects prior to the Fiscal Year 2004 Program should comply with these standards where possible.

1-6.1.2 **Host-Nation And Other Foreign Government Funding.** These standards apply to new construction funded under host-nation agreements or from other funding sources starting in Fiscal Year 2004 or as soon as negotiations with the foreign governments can be completed.

1-6.1.3 **Other Funding Sources.** These standards apply to all new construction projects funded by sources other than MILCON (such as Non-Appropriated Funds, Operations and Maintenance, and Working Capital Funds) starting with Fiscal Year 2004. Projects funded prior to that fiscal year should comply with these standards where possible.

1-6.2 **Existing Buildings.** These standards will apply to existing facilities starting with the Fiscal Year 2004 program when triggered as specified below, regardless of funding source. Projects funded prior to that fiscal year should comply with these standards where possible. For existing leased buildings see paragraph 1-6.4.

1-6.2.1 **Major Investments.** Implementation of these standards to bring an entire building into compliance is mandatory for all DoD building renovations, modifications, repairs, and restorations where those costs exceed 50% of the replacement cost of the building except as otherwise stated in these standards. The 50% cost is exclusive of the costs identified to meet these standards. Where the 50% threshold is not met, compliance with these standards is recommended.

1-6.2.2 **Conversion of Use.** Implementation of these standards is mandatory when any portion of a building is modified from its current use to that of an inhabited building, billeting, or a primary gathering building for one year or more. Examples would include a warehouse (uninhabited) being converted to administrative (inhabited) use and an inhabited administrative building being converted to a primary gathering building or billeting.

1-6.2.3 **Glazing Replacement.** Because of the significance of glazing hazards in a blast environment, implementation of the glazing provisions of these standards is mandatory for existing inhabited buildings within any planned window or door glazing

replacement project. Such replacements may require window frame modification or replacement.

1-6.3 **Building Additions.** Additions to existing inhabited buildings shall comply with the minimum standards for new buildings. If the addition is 50% or more of the gross area of the existing building, the existing building shall comply with the minimum standards for existing buildings.

1-6.4 **Leased Buildings.** DoD personnel occupying leased buildings deserve the same level of protection as those in DoD-owned buildings. Implementation of these standards is therefore mandatory for all facilities leased for DoD use and for those buildings in which DoD receives a space assignment from another government agency except as established below. This requirement is intended to cover all situations, including General Services Administration space, privatized buildings, and host-nation and other foreign government buildings. This requirement is applicable for all new leases executed on or after 1 October 2005 and to renewal or extension of any existing lease on or after 1 October 2009. Leases executed prior to the above fiscal years will comply with these standards where possible.

1-6.4.1 **Partial Occupancy.** These standards only apply where DoD personnel occupy leased or assigned space constituting at least 25% of the net interior useable area or the area as defined in the lease, and they only apply to that portion of the building that is occupied by DoD personnel.

1-6.4.2 **New Buildings.** Buildings that are built to lease to DoD as of the effective date established above shall comply with the standards for new construction.

1-6.4.3 **Existing Buildings.** New leases or renewals of leases of existing buildings will trigger the minimum standards for existing buildings in accordance with the effective dates established above.

1-6.5 **Expeditionary and Temporary Structures.** Implementation of these standards is mandatory for all expeditionary and temporary structures that meet the occupancy criteria for inhabited or primary gathering buildings or billeting. See Appendix D for structure types that meet the expeditionary and temporary structures criteria.

1-6.5.1 **New Structures.** These standards apply to all new expeditionary sites effective immediately.

1-6.5.2 **Existing Structures.** These standards will apply to all existing expeditionary activities beginning in Fiscal Year 2004. Prior to that fiscal year, existing expeditionary structures should comply with these standards where possible.

1-6.6 **National Guard Buildings.** Any National Guard building that uses Federal funding for new construction, renovations, modifications, repairs, restorations, or leasing and that meets the applicability provisions above, will comply with these standards.

1-6.7 **Exemptions.** Unless DoD Components dictate otherwise, the following buildings are exempt from requirements of these standards as specified below. However, compliance with these standards for those buildings is recommended where possible. In addition, there are some exemptions to elements of individual standards that are included in the text of those standards in appendix B. The rationale for all exemptions is detailed in chapter 2.

1-6.7.1 **Family Housing With 12 Units Or Fewer Per Building.** These buildings are exempt from all provisions of these standards.

1-6.7.2 **Stand-Alone Franchised Food Operations.** These buildings are exempt from standoff distances to parking and roadways. All other standards apply.

1-6.7.3 **Stand Alone Shoppettes, Mini Marts And Similarly Sized Commissaries.** These buildings are exempt from standoff distances to parking and roadways. All other standards apply.

1-6.7.4 **Gas Stations And Car Care Centers.** These facilities are exempt from all provisions of these standards.

1-6.7.5 **Medical Transitional Structures And Spaces.** These structures are exempt from standoff distances to parking and roadways. All other standards apply.

1-6.7.6 **Other Transitional Structures And Spaces.** Transitional structures and spaces that will be occupied for less than one year and that are not billeting, primary gathering buildings, or medical transitional structures, are exempt from standoff distances to parking and roadways. All other standards apply.

1-6.7.7 **Recruiting Stations In Leased Spaces.** Recruiting stations located in leased spaces are exempt from all provisions of these standards.

1-7 **PROGRAMMING.**

1-7.1 **Documentation.** The inclusion of these standards into DoD construction or the inclusion of protective measures above the requirements of these standards will be incorporated into the appropriate construction programming documents (such as the DD Form 1391) in accordance with DoD Component guidance. Refer to the *DoD Security Engineering Manual* for guidance on the costs for implementing these standards and for providing protective measures beyond these standards.

1-7.2 **Funding Thresholds.** For existing buildings, these standards are intended solely to correct design deficiencies to appropriately address emergent life-threatening terrorist risks. As a result, funding thresholds for Unspecified Minor Military Construction and Operations and Maintenance funding may be increased in accordance with 10 USC Sections 2805(a)(1) and 2805 (c)(1).

1-8 **INFORMATION SENSITIVITY.** Some information in these standards is exempt from mandatory disclosure under the Freedom of Information Act. The sensitive information that is exempt is the explosive weights upon which the minimum standoff

distances are based, which is included in UFC 4-010-10. Allowing potential aggressors to know the minimum explosive weights that all DoD inhabited buildings are designed to resist could constitute a vulnerability. To minimize the possibility of that information being used against DoD personnel, the following provisions apply:

1-8.1 **Distribution.** Follow governing DoD and Component guidance for specific requirements for handling and distribution of For Official Use Only information. In general, distribution of this document is unlimited. Distribution of the tables (Tables 1 and 2) in UFC 4-010-10 is authorized only to U.S. Government agencies and their contractors. In addition, where it is within Status of Forces Agreements (SOFA) or other similar information exchange agreements, the information in these standards may be distributed to host-nation elements for the purposes of their administration and design of host-nation funded or designed construction.

1-8.2 **Posting To The Internet.** This document may be posted freely to the Internet; however, because the tables (Tables 1 and 2) in UFC 4-010-10 are For Official Use Only they cannot be posted to any web site that is accessible to the general public. In addition, other documents that include information from these standards that are identified as For Official Use Only cannot be posted to web sites accessible to the general public. For Official Use Only information may be posted to protected, non-publicly accessible web sites that comply with standards established by DoD for administration of web sites.

1-8.3 **Plans and Specifications.** Construction plans and specifications should include only that information from this document that is necessary for a contractor to develop a bid on a project. The explosive weights used in these standards shall not be entered into the plans and specifications unless the plans and specifications are properly safeguarded. Plans and specifications may be posted to the Internet in accordance with existing DoD Component guidance, but such documents will not include For Official Use Only information. All plans and specifications for inhabited buildings shall include an annotation that cites the version of these standards that was used for design.

1-8.4 **Design – Build Contracts.** Where design – build contracts are employed, prospective contractors will be responsible for developing a design proposal for that project that may be impacted by provisions of these standards. Where that is the case, consider alternate means to provide sufficient information to support their proposals. Consider for example, either specifying specific design loads or specifying the required standoff distance and providing candidate structural systems that would allow for mitigation of the applicable explosive if that standoff was less than the minimum. Once the design – build contract is awarded the contractor will be eligible to receive this complete document for use in the development of the final design package, but that contractor will be responsible for protecting the integrity of the information throughout the contract and through any subcontracts into which that contractor might enter.

1-9 **Interim Design Guidance.** The *DoD Security Engineering Manual* is currently unpublished. In lieu of referring to the *DoD Security Engineering Manual*, please see the guidance provided on the Security Engineering Working Group website.

CHAPTER 2

PHILOSOPHY, DESIGN STRATEGIES, AND ASSUMPTIONS

2-1 **GENERAL.** The purpose of this chapter is to clarify the philosophy on which these standards are based, the design strategies that are their foundation, and the assumptions inherent in their provisions. Effective implementation of these standards depends on a reasonable understanding of the rationale for them. With this understanding, engineers and security and antiterrorism personnel can maximize the efficiency of their solutions for complying with these standards while considering site-specific issues and constraints that might dictate measures beyond these minimums.

2-2 **PHILOSOPHY.** The overarching philosophy upon which this document is based is that comprehensive protection against the range of possible threats may be cost prohibitive, but that an appropriate level of protection can be provided for all DoD personnel at a reasonable cost. That level of protection is intended to lessen the risk of mass casualties resulting from terrorist attacks. Full implementation of these standards will provide some protection against all threats and will significantly reduce injuries and fatalities for the threats upon which these standards are based. The costs associated with those levels of protection are assumed to be less than the physical and intangible costs associated with incurring mass casualties. Furthermore, given what we know about terrorism, all DoD decision makers must commit to making smarter investments with our scarce resources and stop investing money in inadequate buildings that DoD personnel will have to occupy for decades, regardless of the threat environment. There are three key elements of this philosophy that influence the implementation of these standards.

2-2.1 **Time.** Protective measures needed to provide the appropriate level of protection must be in place prior to the initiation of a terrorist attack. Incorporating those measures into DoD buildings is least expensive at the time those buildings are either being constructed or are undergoing major renovation, repair, restoration, or modification.

2-2.2 **Master Planning.** Many of these standards significantly impact master planning. The most significant such impact will be in standoff distances. If standoff distances are not “reserved” they will be encroached upon and will not be available should they become necessary in a higher threat environment. The master planning implications of these standards are not intended to be resolved overnight. They should be considered to be a blueprint for facilities and installations that will be implemented over decades as those facilities and installations evolve.

2-2.3 **Design Practices.** The philosophy of these standards is to build greater resistance to terrorist attack into all inhabited buildings. That philosophy affects the general practice of designing inhabited buildings. While these standards are not based on a known threat, they are intended to provide the easiest and most economical methods to minimize injuries and fatalities in the event of a terrorist attack. The primary methods to achieve this outcome are to maximize standoff distance, to construct superstructures to avoid progressive collapse, and to reduce flying debris hazards.

These and related design issues are intended to be incorporated into standard design practice in the future.

2-3 **DESIGN STRATEGIES.** There are several major design strategies that are applied throughout these standards. They do not account for all of the measures considered in these standards, but they are the most effective and economical in protecting DoD personnel from terrorist attacks. These strategies are summarized below.

2-3.1 **Maximize Standoff Distance.** The primary design strategy is to keep terrorists as far away from inhabited DoD buildings as possible. The easiest and least costly opportunity for achieving the appropriate levels of protection against terrorist threats is to incorporate sufficient standoff distance into project designs. While sufficient standoff distance is not always available to provide the minimum standoff distances required for conventional construction, maximizing the available standoff distance always results in the most cost-effective solution. Maximizing standoff distance also ensures that there is opportunity in the future to upgrade buildings to meet increased threats or to accommodate higher levels of protection.

2-3.2 **Prevent Building Collapse.** Provisions relating to preventing building collapse and building component failure are essential to effectively protecting building occupants, especially from fatalities. Designing those provisions into buildings during new construction or retrofitting during major renovations, repairs, restorations, or modifications of existing buildings is the most cost effective time to do that. In addition, structural systems that provide greater continuity and redundancy among structural components will help limit collapse in the event of severe structural damage from unpredictable terrorist acts.

2-3.3 **Minimize Hazardous Flying Debris.** In past explosive events where there was no building collapse, a high number of injuries resulted from flying glass fragments and debris from walls, ceilings, and fixtures (non-structural features). Flying debris can be minimized through building design and avoidance of certain building materials and construction techniques. The glass used in most windows breaks at very low blast pressures, resulting in hazardous, dagger-like shards. Minimizing those hazards through reduction in window numbers and sizes and through enhanced window construction has a major effect on limiting mass casualties. Window and door designs must treat glazing, frames, connections, and the structural components to which they are attached as an integrated system. Hazardous fragments may also include secondary debris such as those from barriers and site furnishings.

2-3.4 **Provide Effective Building Layout.** Effective design of building layout and orientation can significantly reduce opportunities for terrorists to target building occupants or injure large numbers of people.

2-3.5 **Limit Airborne Contamination.** Effective design of heating, ventilation, and air conditioning (HVAC) systems can significantly reduce the potential for chemical, biological, and radiological agents being distributed throughout buildings.

2-3.6 **Provide Mass Notification.** Providing a timely means to notify building occupants of threats and what should be done in response to those threats reduces the risk of mass casualties.

2-3.7 **Facilitate Future Upgrades.** Many of the provisions of these standards facilitate opportunities to upgrade building protective measures in the future if the threat environment changes.

2-4 **ASSUMPTIONS.** Several assumptions form the foundation for these standards.

2-4.1 **Baseline Threat.** The location, size, and nature of terrorist threats are unpredictable. These standards are based on a specific range of assumed threats that provides a reasonable baseline for the design of all inhabited DoD buildings. Designing to resist baseline threats will provide general protection today and will establish a foundation upon which to build additional measures where justified by higher threats or where the threat environment increases in the future. While those baseline threats are less than some of the terrorist attacks that have been directed against U.S. personnel in the past, they represent more severe threats than a significant majority of historical attacks. It would be cost prohibitive to provide protection against the worst-case scenario in every building. The terrorist threats addressed in these standards are further assumed to be directed against DoD personnel. Threats to other assets and critical infrastructure are beyond the scope of these standards, but they are addressed in the *DoD Security Engineering Manual*. The following are the terrorist tactics upon which these standards are based:

2-4.1.1 **Explosives.** The baseline explosive weights are identified in Tables B-1 and D-1 as explosive weights I, II, and III. Their means of delivery are discussed below.

2-4.1.1.1 **Vehicle Bombs.** For the purposes of these standards, the vehicle bomb is assumed to be a stationary vehicle bomb. The sizes of the explosives in the vehicle bombs associated with explosive weight I (in equivalent weight of TNT) are likely to be detected in a vehicle during a search. Therefore, explosive weight I is the basis for the standoff distances associated with the controlled perimeter. The quantity of explosives associated with explosive weight II is assumed to be able to enter the controlled perimeter undetected; therefore, explosive weight II is the basis for the standoff distances for roadways and parking. Explosive weight II was selected because it represents a tradeoff between likelihood of detection and the risk of injury or damage.

2-4.1.1.2 **Waterborne Vessel Bombs.** For the purposes of these standards, waterborne vessels will also be assumed to contain quantities of explosives associated with explosive weight I. That weight was selected because areas beyond the shoreline are assumed not to be controlled perimeters.

2-4.1.1.3 **Placed Bombs.** Hand-carried explosives placed near buildings can cause significant localized damage, potentially resulting in injuries or fatalities. It is assumed that aggressors will not attempt to place explosive devices in areas near buildings where those devices could be visually detected by building occupants casually observing the area around the building. It is also assumed that there will be sufficient

controls to preclude bombs being brought into buildings. Explosive weight II is assumed to be placed by hand either in trash containers or in the immediate vicinity of buildings. That quantity of explosives is further assumed to be built into a bomb 150 millimeters (6 inches) or greater in height.

2-4.1.1.4 **Mail Bombs.** Explosives in packages delivered through the mail can cause significant localized damage, injuries, and fatalities if they detonate inside a building. No assumption as to the size of such explosives is made in these standards. Provisions for mail bombs are limited to locations of mailrooms so that they can be more readily hardened if a specific threat of a mail bomb is identified in the future.

2-4.1.2 **Indirect Fire Weapons.** For the purpose of these standards, indirect fire weapons are assumed to be military mortars with fragmentation rounds containing explosives equivalent to explosive weight III in Tables B-1 and D-1. Protection against the effects of such rounds on an individual building is not considered practical as a minimum standard; therefore, these standards are intended to limit collateral damage to adjacent buildings from these weapons.

2-4.1.3 **Direct Fire Weapons.** For the purpose of these standards, direct fire weapons include small arms weapons and shoulder fired rockets that require a direct line of sight. Some standards in this document are predicated on a direct fire weapon threat. Provisions of those standards are based on the assumption that those weapons will be fired from vantage points outside the control of an installation or facility. Obscuration or screening that minimizes targeting opportunities is assumed to be the primary means of protecting DoD personnel from these weapons in these standards.

2-4.1.4 **Fire.** Recent incidents indicate that causing fires can be considered a terrorist tactic. Fire may be used as a direct terrorist tactic or it may be a secondary effect of some other tactic. Examples of how fire might be used as a direct tactic would include arson and driving a fuel truck or other fuel-laden vehicle into a building.

2-4.1.5 **Chemical, Biological, and Radiological Weapons.** For the purposes of these standards, these weapons are assumed to be improvised weapons containing airborne agents employed by terrorists. These standards do not assume comprehensive protection against this threat. They provide means to reduce the potential for widespread dissemination of such agents throughout a building in the event of an attack.

2-4.2 **Controlled Perimeter.** These standards assume that procedures are implemented to search for and detect explosives to limit the likelihood that a vehicle carrying quantities of explosives equivalent to explosive weight I in Tables B-1 and D-1 could penetrate a controlled perimeter undetected. It is further assumed that access control will include provisions to reject vehicles without penetrating the controlled perimeter.

2-4.3 **Levels of Protection.** The potential levels of protection are described in Tables 2-1, 2-2, and 2-3. These standards provide a **Low** level of protection for billeting and primary gathering buildings and a **Very Low** level of protection for other inhabited buildings. Greater protection is provided for primary gathering buildings and billeting

because of the higher concentration of personnel and the more attractive nature of the target. If the minimum standoff distances are provided, or if mitigating measures are provided to achieve an equivalent level of protection, and if the threats are no greater than those indicated in Tables B-1 and D-1, the risk of injuries and fatalities will be reduced. Threats higher than those envisioned in Tables B-1 and D-1 will increase the likelihood of injuries and fatalities regardless of the level of protection. Refer to the *DoD Security Engineering Manual* for detailed guidance on levels of protection and how to achieve them for a wide range of threats.

2-4.4 **Minimum Standoff Distances.** The minimum standoff distances identified in Tables B-1 and D-1 were developed to provide survivable structures for a wide range of conventionally constructed buildings and expeditionary/temporary structures. These buildings range from tents and wood framed buildings to reinforced concrete buildings. For a more detailed discussion of this issue, refer to the *DoD Security Engineering Manual*.

2-4.4.1 **Conventional Construction Standoff Distance.** The standoff distances in the "Conventional Construction Standoff Distance" column in Table B-1 are based on explosive safety considerations that have been developed based on years of experience and observation. Those standoff distances may be conservative for heavy construction such as reinforced concrete or reinforced masonry; however, they may be just adequate for lighter-weight construction.

2-4.4.2 **Effective Standoff Distance.** Because standoff distances from the "Conventional Construction Standoff Distance" column of Table B-1 may be overly conservative for some construction types, these standards allow for the adjustment of standoff distances based on the results of a structural analysis considering the applicable explosive weights in Table B-1. For new buildings, even if such an analysis suggests a standoff distance of less than those shown in the "Effective Standoff Distance" column of Table B-1, standoff distances of less than those in that column are not allowed to ensure there is a minimal standoff distance "reserved" to accommodate future upgrades that could be necessitated by emerging threats. In addition, the 10 meter (33 feet) minimum is established to ensure there is no encroachment on the unobstructed space. For existing buildings, the standoff distances in the "Effective Standoff Distance" column of Table B-1 will be provided except where doing so is not possible. In those cases, lesser standoff distances may be allowed where the required level of protection can be shown to be achieved through analysis or can be achieved through building hardening or other mitigating construction or retrofit.

2-4.4.3 **Temporary and Expeditionary Construction.** The standoff distances in Table D-1 are based on blast testing conducted against TEMPER Tents, SEA Huts, General Purpose Shelters, and Small Shelter Systems. With adequate analysis those distances may be able to be reduced without requiring mitigating measures.

2-4.5 **Exempted Building Types.** For the reasons below some building types are exempted from some or all of these standards. The minimum standards should be applied to the exempted building types where possible.

Table 2-1 Levels of Protection – New Buildings

Level of Protection	Potential Structural Damage	Potential Door and Glazing Hazards	Potential Injury
Below AT standards	Severely damaged. Frame collapse/massive destruction. Little left standing.	Doors and windows fail and result in lethal hazards	Majority of personnel suffer fatalities.
Very Low	Heavily damaged - onset of structural collapse: Major deformation of primary and secondary structural members, but progressive collapse is unlikely. Collapse of non-structural elements.	Glazing will break and is likely to be propelled into the building, resulting in serious glazing fragment injuries, but fragments will be reduced. Doors may be propelled into rooms, presenting serious hazards.	Majority of personnel suffer serious injuries. There are likely to be a limited number (10% to 25%) of fatalities.
Low	Damaged – unrepairable. Major deformation of non-structural elements and secondary structural members and minor deformation of primary structural members, but progressive collapse is unlikely.	Glazing will break, but fall within 1 meter of the wall or otherwise not present a significant fragment hazard. Doors may fail, but they will rebound out of their frames, presenting minimal hazards.	Majority of personnel suffer significant injuries. There may be a few (<10%) fatalities.
Medium	Damaged – repairable. Minor deformations of non-structural elements and secondary structural members and no permanent deformation in primary structural members.	Glazing will break, but will remain in the window frame. Doors will stay in frames, but will not be reusable.	Some minor injuries, but fatalities are unlikely.
High	Superficially damaged. No permanent deformation of primary and secondary structural members or non-structural elements.	Glazing will not break. Doors will be reusable.	Only superficial injuries are likely.

Table 2-2 Levels of Protection – Existing Buildings

Level of Protection	Potential Structural Damage	Potential Door and Glazing Hazards	Potential Injury
Below AT standards	Severely damaged. Frame collapse/massive destruction. Little left standing.	Doors and windows fail and result in lethal hazards	Majority of personnel suffer fatalities.
Very Low	Heavily damaged - onset of structural collapse: Major deformation of primary structural members, but progressive collapse is unlikely. Collapse of secondary structural members and non-structural elements.	Glazing will break and is likely to be propelled into the building, resulting in serious glazing fragment injuries, but fragments will be reduced. Doors may be propelled into rooms, presenting serious hazards.	Majority of personnel suffer serious injuries. There are likely to be a limited number (10% to 25%) of fatalities.
Low	Damaged – unrepairable. Major deformation of secondary structural members and minor deformation of primary structural members, but progressive collapse is unlikely. Collapse of non-structural elements.	Glazing will break and is likely to be propelled into the building, but should result in survivable glazing fragment injuries. Doors may fail, but they will rebound out of their frames, presenting minimal hazards.	Majority of personnel suffer significant injuries. There may be a few (<10%) fatalities.
Medium	Damaged – repairable. Minor deformations of secondary structural members and no permanent deformation in primary structural members. Major deformation of non-structural elements.	Glazing will break, but will remain in the window frame. Doors will stay in frames, but will not be reusable.	Some minor injuries, but fatalities are unlikely.
High	Superficially damaged. No permanent deformation of primary and secondary structural members or non-structural elements.	Glazing will not break. Doors will be reusable.	Only superficial injuries are likely.

Table 2-3 Levels of Protection – Expeditionary and Temporary Structures		
Level of Protection	**Potential Structural Damage**	**Potential Injury**
Below AT Standards	Severely damaged. Frame collapse/massive destruction. Little left standing.	Majority of personnel suffer fatalities.
Very Low	Heavily damaged. Major portions of the structure will collapse (over 50%). A significant percentage of secondary structural members will collapse (over 50%).	Majority of personnel suffer serious injuries. There are likely to be a limited number (10% to 25%) of fatalities.
Low	Damaged – unrepairable. Some sections of the structure may collapse or lose structural capacity (10 to 20% of structure).	Majority of personnel suffer significant injuries. There may be a few (<10%) fatalities.
Medium	Damaged – repairable. Minor to major deformations of both structural members and non-structural elements. Some secondary debris will be likely, but the structure remains intact with collapse unlikely.	Some minor injuries, but no fatalities are likely.
High	Superficially damaged. No permanent deformation of primary and secondary structural members or non-structural elements.	Only superficial injuries are likely.

2-4.5.1 **Family Housing.** The exemption of family housing with 12 units or fewer in a single building acknowledges that the density of such units is generally low, reducing the likelihood of mass casualties. It also acknowledges the fact that low-density housing has rarely been directly targeted by terrorists. A further assumption for existing family housing with 13 or more units per building is that by designating parking spaces for specific residents or residences, the risk of parking vehicle bombs in those parking areas is reduced due to increased awareness of the vehicles that are authorized to park there.

2-4.5.2 **Shoppettes, Mini Marts, Similarly Sized Commissaries and Stand-Alone Franchised Food Operations.** These facilities by the nature of their smaller size and their operation require parking in close proximity; therefore, they are exempted from the minimum standoff distances for parking and roadways. Applying other upgrades required by these standards is feasible, however, and will lessen the risk of mass casualties.

2-4.5.3 **Gas Stations and Car Care Centers.** These facilities are exempted from these standards because, by the nature of their operation, cars must be allowed to be in close proximity to them. Other measures included in these standards would be ineffective in the absence of any control on vehicles.

2-4.5.4 **Medical Transitional Structures and Spaces.** These structures and spaces may be required for limited durations to maintain mission-critical operations during construction that require close proximity or physical connection to the existing building undergoing construction. This may make compliance with some of the standoff distance provisions of these standards impractical during the limited construction duration.

2-4.5.5 **Other Transitional Structures and Spaces.** These structures and spaces are exempted from some of the standoff distance provisions of these standards because it would be impractical to apply them considering the limited less-than-1-year duration of occupancy.

2-4.5.6 **Recruiting Stations In Leased Spaces.** These facilities are exempted because their visibility and accessibility necessitate their being located in public spaces, which makes requiring them to comply with these standards impractical. In addition, the majority of these facilities do not have a sufficient population and population density to meet the inhabited building standard.

2-4.6 **Policies and Procedures.** Policies and procedures are a critical adjunct to building standards. It is assumed that there are means to control access to controlled perimeters, underground parking, and other locations where vehicle access needs to be limited. It is further assumed that unusual packages or containers or improperly parked vehicles will be recognized as potential terrorist threats and appropriate reactive measures will be implemented to reduce the potential for casualties. Finally, it is assumed that policies and procedures will be developed to support these and other related issues and that those policies and procedures will be incorporated into antiterrorism plans, training, and exercises.

2-4.7 **Design Criteria.** It is assumed that the provisions of these standards will be coordinated with all other applicable DoD building and design criteria and policies. Nothing in these standards should be interpreted to supersede the provisions of any other applicable building or design criteria. Where other criteria mandate more stringent requirements, it is assumed that the provisions of those criteria will be followed.

2-4.8 **Enhanced Fire Safety.** Historic fire scenarios and fuel loadings for various common buildings types that are the basis for requirements in building and life safety codes are likely to be much less severe than those experienced in terrorist attacks. Therefore, in the event of a terrorist attack, fire safety may be critical to the survival of building occupants and limiting the extent of building damage. Fire safety may be enhanced by designing buildings to limit the extent or severity of a fire and providing more effective egress routes. Changes to fire safety requirements, while they may be justifiable from an antiterrorism standpoint, are beyond the scope of these standards.

2-4.9 **Training.** It is assumed that key security and facility personnel will receive training in security engineering, antiterrorism, and related areas. Refer to the Security Engineering Working Group web site for available training and to DoD 2000.12-H for additional information on training issues. It is further assumed that all DoD personnel have been trained in basic antiterrorism awareness in accordance with DoDI 2000.16, that they are able to recognize potential threats, and that they know the proper courses of action should they detect a potential threat.

2-4.10 **Expeditionary and Temporary Structures.** Expeditionary and temporary structures are commonly built of either combinations of metal frames and fabric or wood frames and rigid walls. It is assumed that most expeditionary and temporary structures cannot be retrofitted or hardened sufficiently for higher threats; therefore, unless adequate planning is done to obtain the needed space to achieve appropriate standoff, DoD personnel will be highly vulnerable to terrorist attack.

2-4.11 **Leased Buildings.** DoD personnel occupying leased buildings deserve the same level of protection as those in DoD-owned buildings; therefore, they should meet the requirements of these standards wherever possible. They must meet the requirements when the DoD occupancy meets the criteria in these standards. The thresholds in those criteria reflect the significance of higher populations of DoD personnel as targets versus the inherent risk reduction associated with dispersing DoD personnel.

APPENDIX A

DEFINITIONS

Access control. For the purposes of these standards, any combination of barriers, gates, electronic security equipment, and/or guards that can deny entry to unauthorized personnel or vehicles.

Access road. Any roadway such as a maintenance, delivery, service, emergency, or other special limited use road that is necessary for the operation of a building or structure.

Billeting. Any building or portion of a building in which 11 or more unaccompanied DoD personnel are routinely housed, including Temporary Lodging Facilities and military family housing permanently converted to unaccompanied housing. Billeting also applies to expeditionary and temporary structures with similar population densities and functions.

Building hardening. Enhanced conventional construction that mitigates threat hazards where standoff distance is limited. Building hardening may also be considered to include the prohibition of certain building materials and construction techniques.

Building separation. The distance between closest points on the exterior walls of adjacent buildings or structures.

Collateral damage. Injury to personnel or damage to buildings that are not the primary target of an attack.

Container structures. Structures built using shipping containers that are designed to withstand structural loadings associated with shipping, including Container Express (CONEX) and International Organization for Standardization (ISO) containers. Testing has shown that these structures behave similarly to buildings for the purposes of these standards.

Controlled perimeter. For the purposes of these standards, a physical boundary at which vehicle access is controlled at the perimeter of an installation, an area within an installation, or another area with restricted access. A physical boundary will be considered as a sufficient means to channel vehicles to the access control points. At a minimum, access control at a controlled perimeter requires the demonstrated capability to search for and detect explosives. Where the controlled perimeter includes a shoreline and there is no defined perimeter beyond the shoreline, the boundary will be at the mean high water mark.

Conventional construction. Building construction that is not specifically designed to resist weapons or explosives effects. Conventional construction is designed only to resist common loadings and environmental effects such as wind, seismic, and snow loads.

Conventional Construction Standoff Distance. The standoff distance at which conventional construction may be used for buildings without a specific analysis of blast effects, except as otherwise required in these standards.

Design Basis Threat. The threat (aggressors, tactics, and associated weapons, tools, or explosives) against which assets within a building must be protected and upon which the security engineering design of the building is based.

DoD building. Any building or portion of a building (permanent, temporary, or expeditionary) owned, leased, privatized, or otherwise occupied, managed, or controlled by or for DoD. DoD buildings are categorized within these standards as uninhabited, inhabited, primary gathering and billeting.

DoD Components. The Office of the Secretary of Defense (OSD); the Military Departments (including their National Guard and Reserve Components); the Chairman, Joint Chiefs of Staff and Joint Staff; the Combatant Commands; the Office of the Inspector General of the Department of Defense; the Defense Agencies; the DoD Field Activities; and all other organizational entities within DoD**.**

DoD personnel. Any U.S. military, DoD civilian, or family member thereof, host-nation employees working for DoD, or contractors occupying DoD buildings.

Effective Standoff Distance. A standoff distance less than the Conventional Construction Standoff Distance at which the required level of protection can be shown to be achieved through analysis or can be achieved through building hardening or other mitigating construction or retrofit.

Expeditionary structures. Those structures intended to be inhabited for no more than 1 year after they are erected. This group of structures typically include tents, Small and Medium Shelter Systems, Expandable Shelter Containers (ESC), ISO and CONEX containers, and General Purpose (GP) Medium tents and GP Large tents, etc.

Fabric covered/metal frame construction. A construction type that can be identified by a metal, load-bearing frame (usually aluminum) with some type of fabric (such as canvas) stretched or pulled over the frame. Examples of the types of structures that should be considered under this classification of structures include Frame-Supported Tensioned Fabric Structures (FSTFS); Tent, Extendable, Modular, Personnel (TEMPER Tents); and Small and Medium Shelter Systems (SSS and MSS); and air supported fabric structures. Testing has shown that for these fabric structures, the frame is what causes hazards.

Family housing. DoD buildings used as quarters for DoD personnel and their dependents. For the purposes of these standards, family housing will be considered to include Morale, Welfare, and Recreation housing (cottages) of similar occupancies.

Glazing. The part of a window or door assembly that normally transmits light, but not air.

Inhabited building. Buildings or portions of buildings routinely occupied by 11 or more DoD personnel and with a population density of greater than one person per 40 gross square meters (430 gross square feet). This density generally excludes industrial, maintenance, and storage facilities, except for more densely populated portions of those buildings such as administrative areas. The inhabited building designation also applies to expeditionary and temporary structures with similar population densities. In a building that meets the criterion of having 11 or more personnel, with portions that do not have sufficient population densities to qualify as inhabited buildings, those portions that have sufficient population densities will be considered inhabited buildings while the remainder of the building may be considered uninhabited, subject to provisions of these standards. An example would be a hangar with an administrative area within it. The administrative area would be treated as an inhabited building while the remainder of the hangar could be treated as uninhabited. (Note: This definition differs significantly from the definition for inhabited building used by DoD 6055.9-STD and is not construed to be authorization to deviate from criteria of DoD 6055.9-STD.)

Laminated glass. Multiple sheets of glass bonded together by a bonding interlayer.

Level of protection. The degree to which an asset (person, equipment, object, etc.) is protected against injury or damage from an attack.

Mass notification. Capability to provide real-time information to all building occupants or personnel in the immediate vicinity of a building during emergency situations.

Medical transitional structures and spaces. Structures that are erected or leased for temporary occupancy to maintain mission-critical medical care during construction, renovation, modification, repair or restoration of an existing medical structure. Examples include urgent, ambulatory, and acute care operations.

Parking. Designated areas where vehicles may be left unattended.

Primary gathering building. Inhabited buildings routinely occupied by 50 or more DoD personnel and family housing with 13 or more family units per building. This designation applies to the entire portion of a building that meets the population density requirements for an inhabited building. For example, an inhabited portion of the building that has an area within it with 50 or more personnel is a primary gathering building for the entire inhabited portion of the building. The primary gathering building designation also applies to expeditionary and temporary structures with similar population densities.

Progressive collapse. A chain reaction failure of building members to an extent disproportionate to the original localized damage. Such damage may result in upper floors of a building collapsing onto lower floors.

Roadways. Any surface intended for motorized vehicle traffic.

Routinely occupied. For the purposes of these standards, an established or predictable pattern of activity within a building that terrorists could recognize and exploit.

Security engineering. The process of identifying practical, risk managed short and long-term solutions to reduce and/or mitigate dynamic manmade hazards by integrating multiple factors, including construction, equipment, manpower, and procedures.

Specific threat. Known or postulated aggressor activity focused on targeting a particular asset.

Standoff distance. A distance maintained between a building or portion thereof and the potential location for an explosive detonation.

Structure group. A cluster of expeditionary or temporary structures consisting of multiple rows of individual structures with 200 or fewer DoD personnel.

Structural glazed window systems. Window systems in which glazing is bonded to both sides of the window frame using an adhesive such as a high-strength, high-performance silicone sealant.

Superstructure. The supporting elements of a building above the foundation.

Temporary structures. Those structures that are erected with an expected occupancy of 3 years or less. This group of structures typically includes wood frame and rigid wall construction, and such things as Southeast Asia (SEA) Huts, hardback tents, ISO and CONEX containers, pre-engineered buildings, trailers, stress tensioned shelters, Expandable Shelter Containers (ESC), and Aircraft Hangars (ACH).

TNT equivalent weight. The weight of TNT (trinitrotoluene) that has an equivalent energetic output to that of a different weight of another explosive compound.

Transitional structures and spaces. Structures or spaces within buildings that are used to temporarily (less than 1 year) relocate occupants of another building while that building undergoes renovations, modifications, repairs, or restorations.

Unobstructed space. Space within 10 meters (33 feet) of an inhabited building that does not allow for concealment from observation of explosive devices 150 mm (6 inches) or greater in height.

APPENDIX B

DoD MINIMUM ANTITERRORISM STANDARDS FOR NEW AND EXISTING BUILDINGS

B-1 **SITE PLANNING.** Operational, logistic, and security requirements must be integrated into the overall design of buildings, equipment, landscaping, parking, roads, and other features. The most cost-effective solution for mitigating explosive effects on buildings is to keep explosives as far as possible from them. Standoff distance must be coupled with appropriate building hardening to provide the necessary level of protection to DoD personnel. The following standards detail minimum standoff distances that when achieved will allow for buildings to be built with minimal additional construction costs. Where these standoff distances cannot be achieved because land is unavailable, these standards allow for building hardening to mitigate the blast effects. Costs and requirements for building hardening are addressed in the *DoD Security Engineering Manual*.

B-1.1 **Standard 1. Minimum Standoff Distances.** The minimum standoff distances apply to all new and existing (when triggered) DoD buildings covered by these standards. The minimum standoff distances are presented in Table B-1 and illustrated in Figures B-1 and B-2. Where the standoff distances in the "Conventional Construction Standoff Distance" column of Table B-1 can be met, conventional construction may be used for the buildings without a specific analysis of blast effects, except as otherwise required in these standards. Where those distances are not available, an engineer experienced in blast-resistant design should analyze the building and apply building hardening as necessary to mitigate the effects of the explosives indicated in Table B-1 at the achievable standoff distance to the appropriate level of protection. The appropriate levels of protection for each building category are shown in Table B-1, and are described in Tables 2-1 and 2-2 and in the *DoD Security Engineering Manual*. For new buildings, standoff distances of less than those shown in the "Effective Standoff Distance" column in Table B-1 are not allowed. For existing buildings, the standoff distances in the "Effective Standoff Distance" column of Table B-1 will be provided except where doing so is not possible. In those cases, lesser standoff distances may be allowed where the required level of protection can be shown to be achieved through analysis or can be achieved through building hardening or other mitigating construction or retrofit.

B-1.1.1 **Controlled Perimeter.** Measure the standoff distance from the controlled perimeter to the closest point on the building exterior or inhabited portion of the building.

B-1.1.2 **Parking and Roadways.** Standoff distances for parking and roadways are based on the assumption that there is a controlled perimeter at which larger vehicle bombs will be detected and kept from entering the controlled perimeter. Where there is a controlled perimeter, the standoff distances and explosive weight associated with parking and roadways in Table B-1 apply. If there is no controlled perimeter, assume that the larger explosive weights upon which the controlled perimeter standoff distances are based (explosive weight I from Table B-1) can access parking and roadways near

Table B-1 Minimum Standoff Distances and Separation for New and Existing Buildings

Location	Building Category	Standoff Distance or Separation Requirements			
		Applicable Level of Protection	Conventional Construction Standoff Distance	Effective Standoff Distance(1)	Applicable Explosive Weight (2)
Controlled Perimeter or Parking and Roadways without a Controlled Perimeter	Billeting	Low	45 m (4) (148 ft.)	25 m (4) (82 ft.)	**I**
	Primary Gathering Building	Low	45 m (4) (5) (148 ft.)	25 m (4) (5) (82 ft.)	**I**
	Inhabited Building	Very Low	25 m (4) (82 ft.)	10 m (4) (33 ft.)	**I**
Parking and Roadways within a Controlled Perimeter	Billeting	Low	25 m (4) (82 ft.)	10 m (4) (33 ft.)	**II**
	Primary Gathering Building	Low	25 m (4) (5) (82 ft.)	10 m (4) (5) (33 ft.)	**II**
	Inhabited Building	Very Low	10 m (4) (33 ft.)	10 m (4) (33 ft.)	**II**
Trash Containers	Billeting	Low	25 m (82 ft.)	10 m (33 ft.)	**II**
	Primary Gathering Building	Low	25 m (82 ft.)	10 m (33 ft.)	**II**
	Inhabited Building	Very Low	10 m (33 ft.)	10 m (33 ft.)	**II**
Building Separation (for new buildings only)	Billeting	Low	10 m (33 ft.)	No antiterrorism minimum	**III** (3)
	Primary Gathering Building	Low	10 m (33 ft.)	No antiterrorism minimum	**III** (3)
	Inhabited Building	Very Low	No antiterrorism minimum	No antiterrorism minimum	Not applicable

(1) Even with analysis, standoff distances less than those in this column are not allowed for new buildings, but are allowed for existing buildings if constructed/retrofitted to provide the required level of protection at the reduced standoff distance.
(2) See UFC 4-010-10, for the specific explosive weights (kg/pounds of TNT) associated with designations – I, II, III. UFC 4-010-10 is For Official Use Only (FOUO)
(3) Explosive for building separation is an indirect fire (mortar) round.
(4) For existing buildings, see paragraph B-1.1.2.2.
(5) For existing family housing, see paragraph B-1.1.2.2.3.

Figure B-1 Standoff Distances and Building Separation – Controlled Perimeter

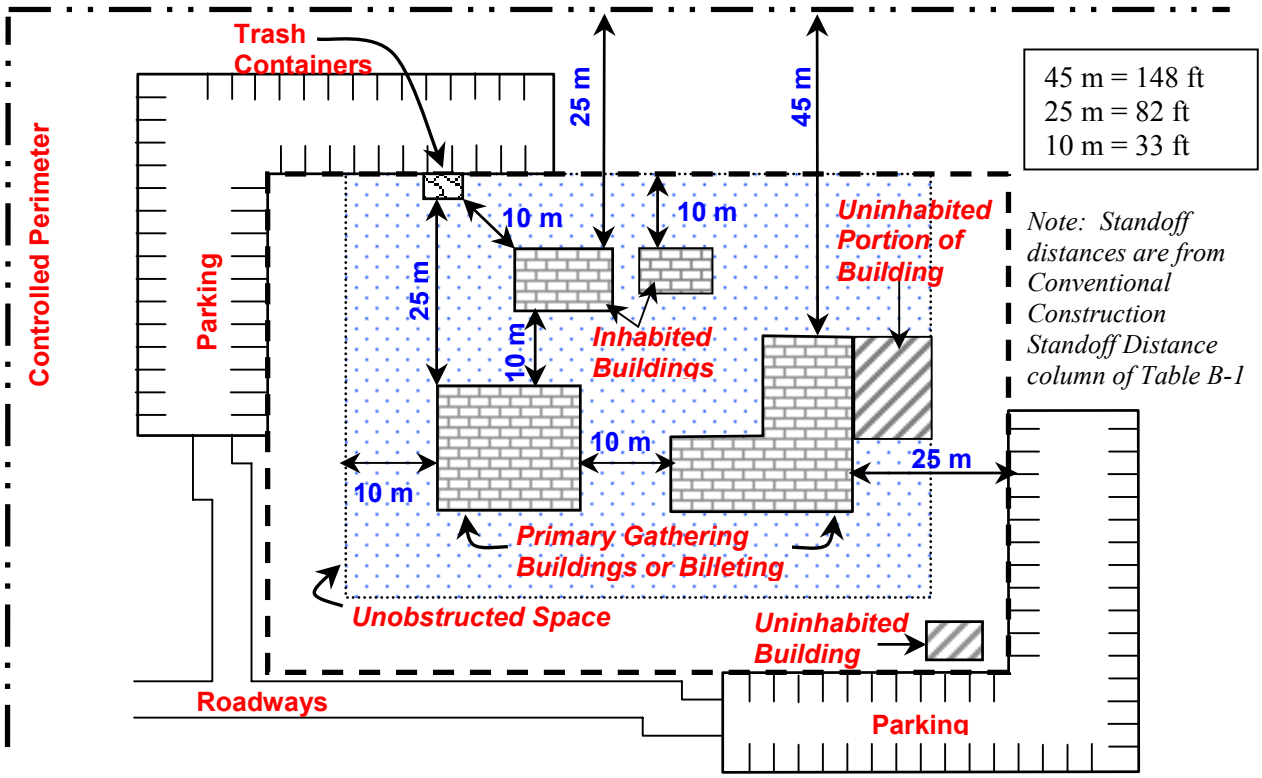
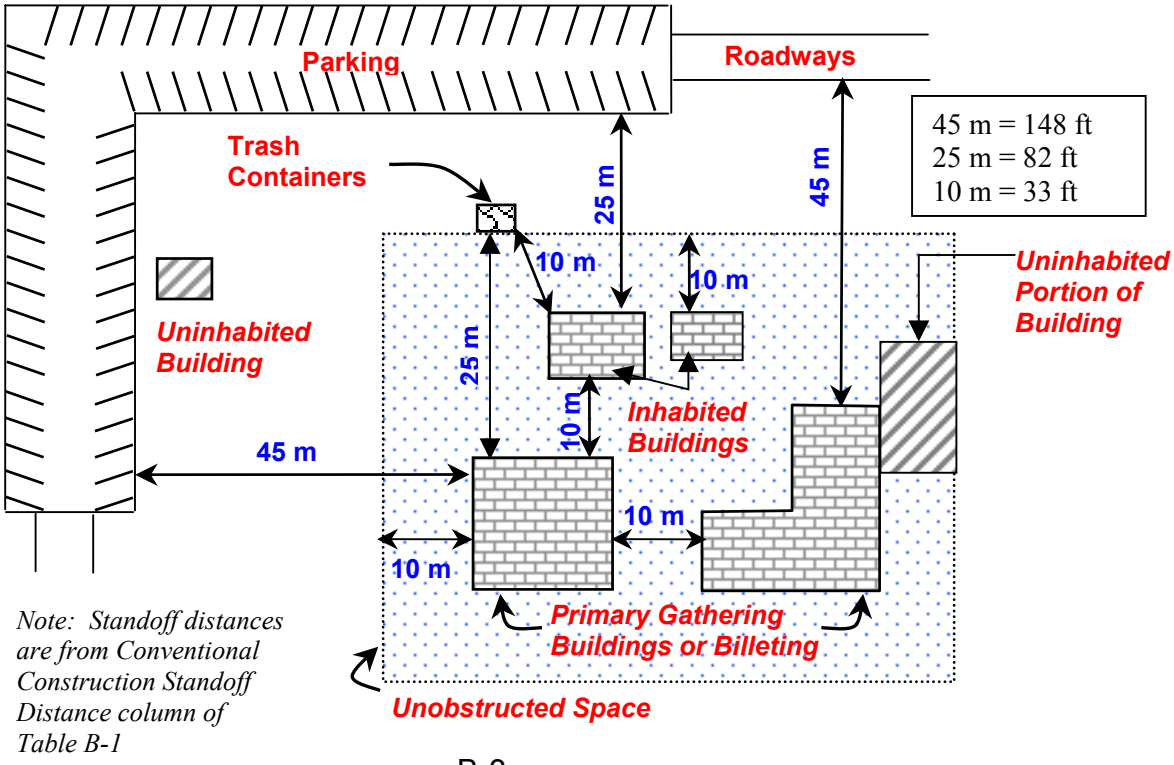


Figure B-2 Standoff Distances and Building Separation – No Controlled Perimeter



buildings. Therefore, where there is no controlled perimeter, use standoff distances from parking and roadways according to the distances and the explosive weight associated with controlled perimeters in Table B-1. Measure the standoff distance from the closest edge of parking areas and roadways to the closest point on the building exterior or inhabited portion of the building. In addition, the following apply:

B-1.1.2.1 **New Inhabited Buildings.** The minimum standoff for all new buildings regardless of hardening or analysis is 10 meters (33 feet) for both parking areas and roadways.

B-1.1.2.2 **Existing Inhabited Buildings.** Where possible, move parking and roadways away from existing buildings in accordance with the standoff distances and explosive weights in Table B-1. It is recognized, however, that moving existing parking areas and roadways or applying structural retrofits may be impractical; therefore, the following operational options are provided for existing inhabited buildings:

B-1.1.2.2.1 **Parking Areas.** Establish access control to portions of parking areas that are closer than the required standoff distance to ensure unauthorized vehicles are not allowed closer than the required standoff distance. For primary gathering buildings and billeting, if access control is provided to prevent unauthorized parking within the required standoff distance, controlled parking may be permitted as close as 10 meters (33 feet) without hardening or analysis. Controlled parking may be allowed closer if it can be shown by analysis that the required level of protection can be provided at the lesser standoff distance or if it can be provided through building hardening or other mitigating construction or retrofit.

B-1.1.2.2.2 **Parking on Roadways.** Eliminate parking on roadways within the required standoff distances along roads adjacent to existing buildings covered by these standards.

B-1.1.2.2.3 **Parking for Family Housing.** For existing family housing with 13 or more units per building within a controlled perimeter or where there is access control to the parking area, parking within the required standoff distances may be allowed where designated parking spaces are assigned for specific residents or residences. Do not label assigned parking spaces with names or ranks of the residents. Do not encroach upon existing standoff distances where the existing standoff distances are less than the required standoff distances. For example, where the required standoff distance is 10 meters, but existing designated parking is only 8 meters (27 feet) from existing family housing, that parking may be retained, but additional parking will not be allowed closer than 8 meters (27 feet.)

B-1.1.3 **Parking and Roadway Projects.** Where practical, all roadway and parking area projects should comply with the standoff distances from inhabited buildings in Table B-1. Where parking or roadways that are within the standoff distances in Table B-1 from existing buildings are being constructed, expanded, or relocated, do not allow those parking areas and roadways to encroach on the existing standoff distances of any existing inhabited building. That applies even where such projects are not associated with a building renovation, modification, repair, or restoration requiring compliance with these standards.

B-1.1.4 **Trash Containers.** Measure the standoff distance from the nearest point of the trash container or trash container enclosure to the closest point on the building exterior or inhabited portion of the building. Where the standoff distance is not available, harden trash enclosures to mitigate the direct blast effects and secondary fragment effects of the explosive on the building if the applicable level of protection can be proven by analysis. If trash enclosures are secured to preclude introduction of objects into the enclosures by unauthorized personnel, they may be located closer to the building as long as they do not violate the unobstructed space provisions of Standard 3. Openings in screening materials and gaps between the ground and screens or walls making up an enclosure must not be greater than 150 mm (6 inches).

B-1.2 **Standard 2. Building Separation.** Building separation requirements apply to new buildings and are established to minimize the possibility that an attack on one building causes injuries or fatalities in adjacent buildings. The separation distance is predicated on the potential use of indirect fire weapons.

B-1.2.1 **Billeting and Primary Gathering Buildings.** For all new billeting and primary gathering buildings, ensure that adjacent inhabited buildings are separated by at least the distances in Table B-1. Where it is necessary to encroach on those building separations, analyze the structure and provide hardened building components as necessary to mitigate the effects of the explosive indicated in Table B-1 to the appropriate level of protection shown in Table B-1. Levels of protection are described in Table 2-1 and in the *DoD Security Engineering Manual*.

B-1.2.2 **Other Inhabited Buildings.** There are no minimum separation distances required for antiterrorism purposes for inhabited buildings other than billeting and primary gathering buildings.

B-1.3 **Standard 3. Unobstructed Space.** It is assumed that aggressors will not attempt to place explosive devices in areas near buildings where these explosive devices could be visually detected by building occupants observing the area around the building. Therefore, ensure that obstructions within 10 meters (33 feet) of inhabited buildings or portions thereof do not allow for concealment from observation of explosive devices 150 mm (6 inches) or greater in height. This does not preclude the placement of site furnishings or plantings around buildings. It only requires conditions such that any explosive devices placed in that space would be observable by building occupants. For existing buildings where the standoff distances for parking and roadways have been established at less than 10 meters (33 feet) in accordance with paragraph B-1.1.2.2, the unobstructed space may be reduced to be equivalent to that distance.

B-1.3.1 **Electrical and Mechanical Equipment.** The preferred location of electrical and mechanical equipment such as transformers, air-cooled condensers, and packaged chillers is outside the unobstructed space or on the roof. However this standard does not preclude placement within the unobstructed space as long the equipment provides no opportunity for concealment of explosive devices.

B-1.3.2 **Equipment Enclosures.** If walls or other screening devices with more than two sides are placed around electrical or mechanical equipment within the unobstructed space, enclose the equipment on all four sides and the top. Openings in

screening materials and gaps between the ground and screens or walls making up an enclosure will not be greater than 150 mm (6 inches). Secure any surfaces of the enclosures that can be opened so that unauthorized personnel cannot gain access through them.

B-1.4 **Standard 4. Drive-Up/Drop-Off Areas.** Some facilities require access to areas within the required standoff distance for dropping off or picking up people or loading or unloading packages and other objects. Examples that may require drive-up/drop-off include, but are not limited to, medical facilities, exchanges and commissaries, child care centers, and schools.

B-1.4.1 **Marking.** Where operational or safety considerations require drive-up or drop-off areas or drive-through lanes near buildings, ensure those areas or lanes are clearly defined and marked and that their intended use is clear to prevent parking of vehicles in those areas.

B-1.4.2 **Unattended Vehicles.** Do not allow unattended vehicles in drive-up or drop-off areas or drive-through lanes.

B-1.4.3 **Location.** Do not allow drive-through lanes or drive-up/drop-off to be located under any inhabited portion of a building.

B-1.5 **Standard 5. Access Roads.** Where access roads are necessary for the operation of a building (including those required for fire department access), ensure that access control measures are implemented to prohibit unauthorized vehicles from using access roads within the applicable standoff distances in Table B-1.

B-1.6 **Standard 6. Parking Beneath Buildings or on Rooftops.** Eliminate parking beneath inhabited buildings or on rooftops of inhabited buildings. Where very limited real estate makes such parking unavoidable, the following measures must be incorporated into the design for new buildings or mitigating measures must be incorporated into existing buildings to achieve an equivalent level of protection.

B-1.6.1 **Access Control.** Ensure that access control measures are implemented to prohibit unauthorized personnel and vehicles from entering parking areas.

B-1.6.2 **Structural Elements.** Ensure that the floors beneath or roofs above inhabited areas and all other adjacent supporting structural elements will not fail from the detonation in the parking area of an explosive equivalent to explosive weight II in Table B-1.

B-1.6.3 **Progressive Collapse.** All structural elements within and adjacent to the parking area will be subject to all progressive collapse provisions of Standard 7 except that the exterior member removal provision will also apply to interior vertical or horizontal load carrying elements. Apply those provisions based on an explosive equivalent to explosive weight II in Table B-1.

B-2 **STRUCTURAL DESIGN.** If the minimum standoff distances are achieved, conventional construction should minimize the risk of mass casualties from a terrorist

attack. Even if those standoff distances can be achieved, however, incorporate the following additional structural issues that must be incorporated into building designs to ensure that buildings do not experience progressive collapse.

B-2.1 **Standard 7. Progressive Collapse Avoidance.** Progressive collapse is considered to be significant risk for buildings of three or more stories. Basements will be considered stories if they have one or more exposed walls. For all new and existing inhabited buildings of three stories or more, design the superstructure to sustain local damage with the structural system as a whole remaining stable and not being damaged to an extent disproportionate to the original local damage. Achieve this through an arrangement of the structural elements that provides stability to the entire structural system by transferring loads from any locally damaged region to adjacent regions capable of resisting those loads without collapse. Accomplish this by providing sufficient continuity, redundancy, or energy dissipating capacity (ductility, damping, hardness, etc.), or a combination thereof, in the members and connections of the structure. For further guidance, refer to American Society of Civil Engineers Standard 7-98 and to detailed guidance in the *DoD Security Engineering Manual*. In addition, the measures below apply to all buildings of three or more stories.

B-2.1.1 **Columns and Walls.** Design all exterior vertical load-carrying columns and walls to sustain a loss of lateral support at any of the floor levels by adding one story height to the nominal unsupported length. While this standard is based on the assumption of an external threat, where parking beneath buildings is unavoidable, this provision also applies to internal vertical load carrying columns and walls.

B-2.1.2 **Exterior Member Removal.** Analyze the structure to ensure it can withstand removal of one primary exterior vertical or horizontal load-carrying element (i.e., a column or a beam) without progressive collapse.

B-2.1.3 **Floors.** Design all floors with improved capacity to withstand load reversals due to explosive effects by designing them to withstand a net uplift equal to the dead load plus one-half the live load.

B-2.2 **Standard 8. Structural Isolation.**

B-2.2.1 **Building Additions.** Design all additions to existing buildings to be structurally independent from the adjacent existing building. This will minimize the possibility that collapse of one part of the building will affect the stability of the remainder of the building. Alternatively, verify through analysis that collapse of either the addition or the existing building will not result in collapse of the remainder of the building.

B-2.2.2 **Portions of Buildings.** Where there are areas of buildings that do not meet the criteria for inhabited buildings, design the superstructures of those areas to be structurally independent from the inhabited area. This will minimize the possibility that collapse of the uninhabited areas of the building will affect the stability of the superstructure of the inhabited portion of the building. Alternatively, verify through analysis that collapse of uninhabited portions of the building will not result in collapse of

any portion of the building covered by this standard. This standard is not mandatory for existing structures, but it should be implemented where possible

B-2.3 **Standard 9. Building Overhangs.** Avoid building overhangs with inhabited spaces above them where people could gain access to the area underneath the overhang. Where such overhangs must be used, incorporate the following measures into the design for new buildings. Incorporate mitigating measures into existing buildings to achieve an equivalent level of protection.

B-2.3.1 **Parking and Roadway Restrictions.** Ensure that there are no roadways or parking areas under overhangs.

B-2.3.2 **Floors.** Ensure that the floors beneath inhabited areas will not fail from the detonation underneath the overhang of an explosive equivalent to explosive weight II where there is a controlled perimeter and explosive weight I for an uncontrolled perimeter. Explosive weights I and II are identified in Table B-1.

B-2.3.3 **Superstructure.** The progressive collapse provisions of Standard 7, including the provision for loss of lateral support for vertical load carrying elements, will include all structural elements within and adjacent to the overhang.

B-2.4 **Standard 10. Exterior Masonry Walls.** Unreinforced masonry walls are prohibited for the exterior walls of new buildings. A minimum of 0.05 percent vertical reinforcement with a maximum spacing of 1200 mm (48 in) will be provided. For existing buildings, implement mitigating measures to provide an equivalent level of protection.

B-3 **ARCHITECTURAL DESIGN.** Even where the minimum standoff distances are achieved, many aspects of building layout and other architectural design issues must be incorporated to improve overall protection of personnel inside buildings.

B-3.1 **Standard 11. Windows and Glazed Doors.** To minimize hazards from flying glass fragments, apply the provisions for glazing and window frames below for all new and existing inhabited buildings covered by these standards. Windows and frames must work as a system to ensure that their hazard mitigation is effective. These provisions apply even if the minimum standoff distances are met.

B-3.1.1 **Glazing.** Use a minimum of 6-mm (1/4-in) nominal laminated glass for all exterior windows and glazed doors. The 6-mm (1/4-in) laminated glass consists of two nominal 3-mm (1/8-in) glass panes bonded together with a minimum of a 0.75-mm (0.030-inch) polyvinyl-butyral (PVB) interlayer. For insulated glass units, use 6 mm (1/4 inch) laminated glass inner pane as a minimum. For alternatives to the 6-mm (1/4-in) laminated glass that provide equivalent levels of protection, refer to the *DoD Security Engineering Manual*.

B-3.1.2 **Window Frames.** Provide frames and mullions of aluminum or steel. To ensure that the full strength of the PVB inner layer is engaged, design frames, mullions, and window hardware to resist a static load of 7 kilopascals (1 lb per square in) applied to the surface of the glazing. Frame and mullion deformations shall not exceed 1/160 of the unsupported member lengths. The glazing shall have a minimum frame bite of 9.5-

mm (3/8-in) for structural glazed window systems and 25-mm (1-in) for window systems that are not structurally glazed. Design frame connections to surrounding walls to resist a combined ultimate loading consisting of a tension force of 35-kN/m (200-lbs/in) and a shear force of 13-kN/m (75 lbs/in). Design supporting elements and their connections based on their ultimate capacities. In addition, because the resulting dynamic loads are likely to be dissipated through multiple mechanisms, it is not necessary to account for reactions from the supporting elements in the design of the remainder of the structure. Alternatively, use frames that provide an equivalent level of performance. For existing buildings, this may require replacement or significant modification of window frames, anchorage, and supporting elements.

B-3.1.3 **Mitigation.** Where the minimum standoff distances cannot be met, provide glazing and frames that will provide an equivalent level of protection to that provided by the glazing above as described in Tables 2-1 and 2-2 for the applicable explosive weight in Table B-1.

B-3.1.4 **Window Replacement Projects.** Whenever window or door glazing is being replaced in existing inhabited buildings as part of a planned window or glazing replacement project, whether or not the building meets the triggers in paragraph 1-6.2, install glazing that meets all of the requirements above.

B-3.2 **Standard 12. Building Entrance Layout.** The areas outside of installations are commonly not under the direct control of the installations. Where the main entrances to buildings face installation perimeters, people entering and exiting the buildings are vulnerable to being fired upon from vantage points outside the installations. To mitigate those vulnerabilities apply the following measures:

B-3.2.1 **New Buildings.** For new inhabited buildings, ensure that the main entrance to the building does not face an installation perimeter or other uncontrolled vantage points with direct lines of sight to the entrance.

B-3.2.2 **Existing Buildings.** For existing inhabited buildings where the main entrance faces an installation perimeter, either use a different entrance as the main entrance or screen that entrance to limit the ability of potential aggressors to target people entering and leaving the building.

B-3.3 **Standard 13. Exterior Doors.** For all new and existing buildings covered by these standards, ensure that all exterior doors into inhabited areas open outwards. By doing so, the doors will seat into the door frames in response to an explosive blast, increasing the likelihood that the doors will not enter the buildings as hazardous debris.

B-3.4 **Standard 14. Mailrooms.** The following measures address the location of rooms to which mail is delivered or in which mail is handled in new and existing inhabited buildings. The measures involve limiting collateral damage and injuries and facilitating future upgrades to enhance protection should they become necessary.

B-3.4.1 **Location.** Where a new or existing building covered by these standards must have a mailroom, locate that mailroom on the perimeter of the building. By locating the mailroom on the building perimeter there is an opportunity to modify it in the

future if a mail bomb threat is identified. Where mailrooms are located in the interior of buildings, few retrofit options are available for mitigating the mail bomb threat.

B-3.4.2 **Proximity.** Locate mailrooms as far from heavily populated areas of the building and critical infrastructure as possible. This measure will minimize injuries and damage if a mail bomb detonates in the mailroom. Further, it will reduce the potential for wider dissemination of hazardous agents. These apply where the mailroom is not specifically designed to resist those threats.

B-3.4.3 **Sealing.** To limit migration into buildings of airborne chemical, biological, and radiological agents introduced into mailrooms, ensure that mailrooms are well sealed between their envelopes and other portions of the buildings in which they are located. Ensure the mailroom walls are of full height construction that fully extends and is sealed to the undersides of the roofs, to the undersides of any floors above them, or to hard ceilings (i.e. gypsum wallboard ceiling.) Sealing should include visible cracks, the interface joints between walls and ceilings/roofs, and all wall and ceiling/roof penetrations. Doors will have weather stripping on all four edges. Refer to the *DoD Security Engineering Manual* for additional guidance.

B-3.5 **Standard 15. Roof Access.** For all new and existing inhabited buildings covered by these standards, control access to roofs to minimize the possibility of aggressors placing explosives or chemical, biological, or radiological agents there or otherwise threatening building occupants or critical infrastructure.

B-3.5.1 **New Buildings.** For new buildings eliminate all external roof access by providing access from internal stairways or ladders, such as in mechanical rooms.

B-3.5.2 **Existing Buildings.** For existing buildings, eliminate external access where possible or secure external ladders or stairways with locked cages or similar mechanisms.

B-3.6 **Standard 16. Overhead Mounted Architectural Features.** For all new and existing buildings covered by these standards, ensure that overhead mounted features weighing 14 kilograms (31 pounds) or more are mounted to minimize the likelihood that they will fall and injure building occupants. Mount all such systems so that they resist forces of 0.5 times the component weight in any direction and 1.5 times the component weight in the downward direction. This standard does not preclude the need to design architectural feature mountings for forces required by other criteria such as seismic standards.

B-4 **ELECTRICAL AND MECHANICAL DESIGN.** Electrical and mechanical design standards address limiting damage to critical infrastructure, protecting building occupants against chemical, biological, and radiological threats, and notifying building occupants of threats or hazards.

B-4.1 **Standard 17. Air Intakes.** Air intakes to heating, ventilation, and air conditioning (HVAC) systems that are designed to move air throughout a building that are at ground level provide an opportunity for aggressors to easily place contaminants that could be drawn into the building.

B-4.1.1 **New Buildings.** For all new inhabited buildings covered by this document locate all air intakes at least 3 meters (10 feet) above the ground.

B-4.1.2 **Existing Buildings**. The above requirement is recommended, but not mandatory, for existing inhabited buildings covered by these standards.

B-4.2 **Standard 18. Mailroom Ventilation.** To ensure airborne chemical, biological, and radiological agents introduced into mailrooms do not migrate into other areas of buildings in which the mailrooms are located, provide separate, dedicated air ventilation systems for mailrooms. Refer to the *DoD Security Engineering Manual* for additional guidance.

B-4.2.1 **Other Heating and Cooling Systems.** Building heating and cooling systems such as steam, hot water, chilled water, and refrigerant may serve mailrooms as long as the airflow systems for the mailrooms and other areas of the buildings in which they are located remain separate.

B-4.2.2 **Dedicated Exhaust Systems.** Provide dedicated exhaust systems within mailrooms to maintain slight negative air pressures with respect to the remainder of the buildings in which the mailrooms are located so that the flow of air is into and contained in the mailrooms. Though the airflow into the mailrooms will not eliminate the potential spread of contamination by personnel leaving the mailroom, it will limit the migration of airborne contaminants through openings and open doorways.

B-4.2.3 **Outside Intakes and Exhausts.** Provide mailroom ventilation system outside air intakes and exhausts with low leakage isolation dampers that can be closed to isolate the mailrooms.

B-4.2.4 **Isolation Controls.** Provide separate switches or methods of control to isolate mailrooms in the event of a suspected or actual chemical, biological, or radiological release.

B-4.3 **Standard 19. Emergency Air Distribution Shutoff.** For all new and existing inhabited buildings, provide an emergency shutoff switch in the HVAC control system that can immediately shut down air distribution throughout the building except where interior pressure and airflow control would more efficiently prevent the spread of airborne contaminants and/or ensure the safety of egress pathways. Locate the switch (or switches) to be easily accessible by building occupants. Providing such a capability will allow the facility manager or building security manager to limit the distribution of airborne contaminants that may be introduced into the building.

B-4.4 **Standard 20. Utility Distribution and Installation.** Utility systems can suffer significant damage when subjected to the shock of an explosion. Some of these utilities may be critical for safely evacuating personnel from the building or their destruction could cause damage that is disproportionate to other building damage resulting from an explosion. To minimize the possibility of the above hazards, apply the following measures:

B-4.4.1 **Utility Routing.** For all new inhabited buildings, route critical or fragile utilities so that they are not on exterior walls or on walls shared with mailrooms. This requirement is recommended, but not mandatory, for existing buildings.

B-4.4.2 **Redundant Utilities.** Where redundant utilities are required in accordance with other requirements or criteria, ensure that the redundant utilities are not collocated or do not run in the same chases. This minimizes the possibility that both sets of utilities will be adversely affected by a single event.

B-4.4.3 **Emergency Backup Systems.** Where emergency backup systems are required in accordance with requirements or criteria, ensure that they are located away from the system components for which they provide backup.

B-4.5 **Standard 21. Equipment Bracing.** Mount all overhead utilities and other fixtures weighing 14 kilograms (31 pounds) or more to minimize the likelihood that they will fall and injure building occupants. Design all equipment mountings to resist forces of 0.5 times the equipment weight in any direction and 1.5 times the equipment weight in the downward direction. This standard does not preclude the need to design equipment mountings for forces required by other criteria such as seismic standards.

B-4.6 **Standard 22. Under Building Access.** To limit opportunities for aggressors placing explosives underneath buildings, ensure that access to crawl spaces, utility tunnels, and other means of under building access is controlled.

B-4.7 **Standard 23. Mass Notification.** All inhabited buildings must have a timely means to notify occupants of threats and instruct them what to do in response to those threats.

B-4.7.1 **New Buildings.** All new inhabited buildings must have a capability to provide real-time information to building occupants or personnel in the immediate vicinity of the building during emergency situations. The information relayed must be specific enough to determine the appropriate response actions. Any system, procedure, or combination thereof that provides this capability will be acceptable under this standard.

B-4.7.2 **Existing Buildings.** For existing buildings, the above requirement is mandatory for primary gathering buildings and billeting, but recommended for all inhabited buildings.

APPENDIX C

RECOMMENDED ADDITIONAL ANTITERRORISM MEASURES FOR NEW AND EXISTING BUILDINGS

C-1 **SITE PLANNING.** The following additional measures, if implemented, will significantly enhance site security with little increase in cost and should be considered for all new and existing inhabited buildings.

C-1.1 **Recommendation 1. Vehicle Access Points.** The first line of defense in limiting opportunities for aggressors to get vehicles close to DoD buildings is at vehicle access points at the controlled perimeter, in parking areas, and at drive-up/drop-offs points. Keep the number of access points to the minimum necessary for operational or life safety purposes. This will limit the number of points at which access may have to be controlled with barriers and/or personnel in increased threat environments or if the threat increases in the future.

C-1.2 **Recommendation 2. High-Speed Vehicle Approaches.** The energy of a moving vehicle increases with the square of its velocity; therefore, minimizing a vehicle's speed allows vehicle barriers to be lighter and less expensive should vehicle barriers ever become necessary. To facilitate reductions in vehicle speeds in the future, ensure there are no unobstructed vehicle approaches perpendicular to inhabited buildings at the required parking and roadway standoff distances.

C-1.3 **Recommendation 3. Vantage Points.** Vantage points are natural or man-made positions from which potential aggressors can observe and target people or other assets in and around a building. Identify vantage points outside the control of personnel in the targeted building and either eliminate them or provide means to avoid exposure to them. Means to avoid exposure may include actions such as reorienting the building or shielding people or assets in and around the building using such measures as reflective glazing, walls, privacy fencing, or vegetation.

C-1.4 **Recommendation 4. Drive-Up/Drop Off.** Locate these points away from large glazed areas of the building to minimize the potential for hazardous flying glass fragments in the event of an explosion. For example, locate the lane at an outside corner of the building or otherwise away from the main entrance. Coordinate the drive-up/drop-off point with the building geometry to minimize the possibility that explosive blast forces could be increased due to being trapped or otherwise concentrated. For further discussion of this issue, refer to the *DoD Security Engineering Manual*.

C-1.5 **Recommendation 5. Building Location.** Activities with large visitor populations provide opportunities for potential aggressors to get near buildings with minimal controls, and therefore, limit opportunities for early detection. Maximize separation distance between inhabited buildings and areas with large visitor populations.

C-1.6 **Recommendation 6. Railroad Location.** Avoid sites for inhabited buildings that are close to railroads. Where railroads are in the vicinity of existing buildings, provide standoff distances between the railroad and any inhabited buildings

based on the standoff distances and explosive weight associated with controlled perimeters in Table B-1. Where those standoff distances are not available, and since moving existing railroads may be difficult and prohibitively expensive, ensure that there are procedures in place to prohibit trains from stopping in the vicinity of inhabited structures.

C-1.7 **Recommendation 7. Access Control for Family Housing.** For new family housing areas, provide space for controlling access at the perimeter of the housing area so that a controlled perimeter can be established there if the need arises in the future.

C-1.8 **Recommendation 8. Standoff for Family Housing.** For new family housing construction, maintain a minimum standoff distance of 25 meters (82 feet) from installation perimeters and roads, streets, or highways external to housing areas.

C-1.9 **Recommendation 9. Minimize Secondary Debris.** To reduce the hazard of flying debris in the event of an explosion, eliminate unrevetted barriers and site furnishings in the vicinity of inhabited structures that are accessible to vehicle traffic. Revet exposed barriers and site furnishings near inhabited buildings with a minimum of 1 meter (3 feet) of soil or equivalent alternative techniques to prevent fragmentation hazards in the event of an explosion.

C-2 **STRUCTURAL AND ARCHITECTURAL DESIGN.** The following additional measures, if implemented, will significantly enhance building occupants' safety and security with little increase in cost. Consider these measures for all new and existing inhabited buildings.

C-2.1 **Recommendation 10. Structural Redundancy.** Unexpected terrorist acts can result in local collapse of building structural components. To limit the extent of collapse of adjacent components, utilize highly redundant structural systems such as moment resisting frames, detail connections to provide continuity across joints equal to the full structural capacity of connected members, and detail members to accommodate large displacements without complete loss of strength. This recommendation is consistent with paragraph B-2.1 (Standard 7) for preventing progressive collapse, but recommends selection of certain structural systems and greater attention to structural details.

C-2.2 **Recommendation 11. Internal Circulation.** Design circulation within buildings to provide visual detection and monitoring of unauthorized personnel approaching controlled areas or occupied spaces.

C-2.3 **Recommendation 12. Visitor Control.** Controlling visitor access maximizes the possibility of detecting potential threatening activities. Keep locations in buildings where visitor access is controlled away from sensitive or critical areas, areas where high-risk or mission-critical personnel are located, or other areas with large population densities of DoD personnel.

C-2.4 **Recommendation 13. Asset Location.** To minimize exposure to direct blast effects and potential impacts from hazardous glass fragments and other potential

debris, locate critical assets and mission-critical or high-risk personnel away from the building exterior.

C-2.5 **Recommendation 14. Room Layout.** In rooms adjacent to the exterior of the building, position personnel and critical equipment to minimize exposure to direct blast effects and potential impacts from hazardous glass fragments and other potential debris.

C-2.6 **Recommendation 15. External Hallways.** Since doors can become hazardous debris during explosive blast events, doors designed to resist blast effects are expensive, and external hallways have large numbers of doors leading into inhabited areas, avoid exterior hallway configurations for inhabited structures.

C-2.7 **Recommendation 16. Windows.** To minimize the potential for glazing hazards, minimize the size and number of windows for new construction.

APPENDIX D

DOD MINIMUM ANTITERRORISM STANDARDS FOR EXPEDITIONARY AND TEMPORARY STRUCTURES

D-1 **SITE PLANNING STANDARDS.** All the standards that are unique to expeditionary and temporary structures pertain to site planning. Integrate operational, logistic, and security requirements into the overall configuration of structures, equipment, landscaping, parking, roads, and other features. The most cost-effective solution for mitigating explosive effects on expeditionary and temporary structures is to keep explosives as far away as possible. This is especially critical for these types of structures because hardening may or may not be possible. Dispersed layouts reduce risks from a variety of threats by taking full advantage of terrain and site conditions; therefore, nothing in these standards is intended to discourage dispersal. Costs and requirements for expeditionary and temporary structure hardening are addressed in the *DoD Security Engineering Manual*.

D-1.1 **Standard 1. Minimum Standoff Distances.** The minimum standoff distances apply to all new and existing DoD expeditionary and temporary structures covered by these standards except as otherwise stated below. The minimum standoff distances are presented in Table D-1and illustrated in Figure D-1. Except as otherwise required in these standards, where the standoff distances in Table D-1 can be provided, use conventional expeditionary and temporary structures without a specific analysis of blast effects. Where those distances are not available, analysis of the structure by an engineer experienced in blast-resistant design is required and hardening will be applied as necessary (in those cases which permit structure hardening) to mitigate the effects of the explosives indicated in Table D-1 at the achievable standoff distance to the appropriate level of protection. The appropriate levels of protection for each structure category are shown in Table D-1, and are described in Table 2-3 and in the *DoD Security Engineering Manual*. The two structure types in Table D-1 respond in fundamentally different ways to explosive effects. Standoff distances in Table D-1 reflect those differences.

D-1.1.1 **Controlled Perimeter.** Measure the standoff distance from the closest point on the structure exterior to the controlled perimeter.

D-1.1.1.1 **Container Structures and Pre-engineered Buildings.** For these structures, apply the guidance in Appendix B.

D-1.1.1.2 **Fabric Covered/Metal Frame Construction and other Expeditionary or Temporary Structures.** Provide the standoff distance from Table D-1 for the applicable structure category.

D-1.1.2 **Parking and Roadways.** Standoff distances for parking and roadways are based on the assumption that there is a controlled perimeter at which larger vehicle bombs will be detected and kept from entering the controlled perimeter. Where there is a controlled perimeter, the standoff distances and explosive weight associated with

parking and roadways in Table D-1 apply unless otherwise stated below. If there is no controlled perimeter, assume that the larger explosive weights upon which the controlled perimeter standoff distances are based (explosive weight I from Table D-1) can access parking and roadways near buildings. Therefore, where there is no controlled perimeter, use standoff distances from parking and roadways according to the distances and the explosive weight associated with controlled perimeters in Table D-1.

D-1.1.2.1 **Container Structures and Pre-engineered Buildings.** For these structures, apply the guidance in Appendix B.

D-1.1.2.2 **Fabric Covered/Metal Frame Construction and other Expeditionary or Temporary Structures.** Measure the standoff distance from the closest point on the structure exterior to the closest edge of parking areas and roadways. The minimum standoff for all structures regardless of hardening or analysis is 10 meters (33 feet).

D-1.1.2.3 **Existing Fabric Covered/Metal Frame Construction and other Expeditionary or Temporary Structures.** Moving existing parking areas and roadways may be difficult to achieve and structural retrofits to existing structures may be prohibitively expensive or technically impossible; therefore, the following operational options are provided for existing inhabited structures where the standoff distances in Table D-1 are impractical to achieve.

D-1.1.2.3.1 **Parking Areas.** Establish access control to portions of parking areas to ensure unauthorized vehicles are not allowed closer than the required standoff distance. For primary gathering structures and billeting, if access control is provided to prevent unauthorized parking within the required standoff distance, permit controlled parking as close as 10 meters (33 feet) without hardening or analysis.

D-1.1.2.3.2 **Roadways.** Eliminate parking within the required standoff distances along roads adjacent to existing structures covered by these standards.

D-1.1.3 **Trash Containers.** Measure the standoff distance from the nearest point of the trash container or trash container enclosure to the closest point on the structure exterior. Where the standoff distance is not available, hardening of trash enclosures to mitigate the direct blast effects and secondary fragment effects of the explosive on the structure is acceptable, if the applicable level of protection can be proven by analysis. If trash enclosures are secured to preclude introduction of objects into the enclosures by unauthorized personnel, locate them closer to the structure as long as they do not violate the unobstructed space provisions of Standard 3 below. Openings in screening materials and gaps between the ground and screens or walls making up an enclosure will not be greater than 150 mm (6 inches).

D-1.1.3.1 **Container Structures and Pre-engineered Buildings.** For these structures, apply the guidance in Appendix B.

D-1.1.3.2 **Fabric Covered/Metal Frame Construction and other Expeditionary or Temporary Structures.** Provide the standoff distance from Table D-1 for the applicable structure category.

D-1.2 **Standard 2. Structure Separation.** Structure separation requirements are established to minimize the possibility that an attack on one structure causes injuries or fatalities in adjacent structures. The separation distance is predicated on the potential use of indirect fire weapons.

D-1.2.1 **Billeting and Primary Gathering Structures.**

D-1.2.1.1 **Container Structures and Pre-engineered Buildings.** For these structures, apply the guidance in Appendix B.

D-1.2.1.2 **Fabric Covered/Metal Frame Construction and other Expeditionary or Temporary Structures.** For all new billeting and primary gathering structures, ensure that adjacent structures are separated by at least the distances in Table D-1. Where it is necessary to encroach on those structure separations, analyze the structure and provide hardened structure components as necessary to mitigate the effects of the explosive indicated in Table D-1 to the appropriate level of protection as shown in Table D-1. Levels of protection are described in Table 2-3 and in the *DoD Security Engineering Manual*.

D-1.2.2 **Other Inhabited Structures.** There are no minimum separation distances required for antiterrorism for inhabited buildings other than billeting and primary gathering structures.

D-1.3 **Standard 3. Unobstructed Space.** Keep areas within 10 meters (33 feet) of all expeditionary and temporary structures free of items other than those that are part of the utilities and other supporting infrastructure.

D-2 **ADDITIONAL STANDARDS.** In addition to the specific standards detailed in this appendix, apply the standards from Appendix B to expeditionary and temporary structures as follows:

D-2.1 **Fabric Covered/Metal Frame Construction and other Expeditionary or Temporary Structures.** Apply the following standards from Appendix B to these structures:

D-2.1.1 **Standard 4. Drive-Up/Drop Off Areas.**

D-2.1.2 **Standard 5. Access Roads.**

D-2.1.3 **Standard 11. Windows and Glazed Doors.**

D-2.1.4 **Standard 12. Building Entrance Layout.**

D-2.1.5 **Standard 20. Equipment Bracing.**

D-2.1.6 **Standard 22. Mass Notification.**

D-2.2 **Container Structures and Pre-engineered Buildings.** For these structures, all standards in Appendix B apply.

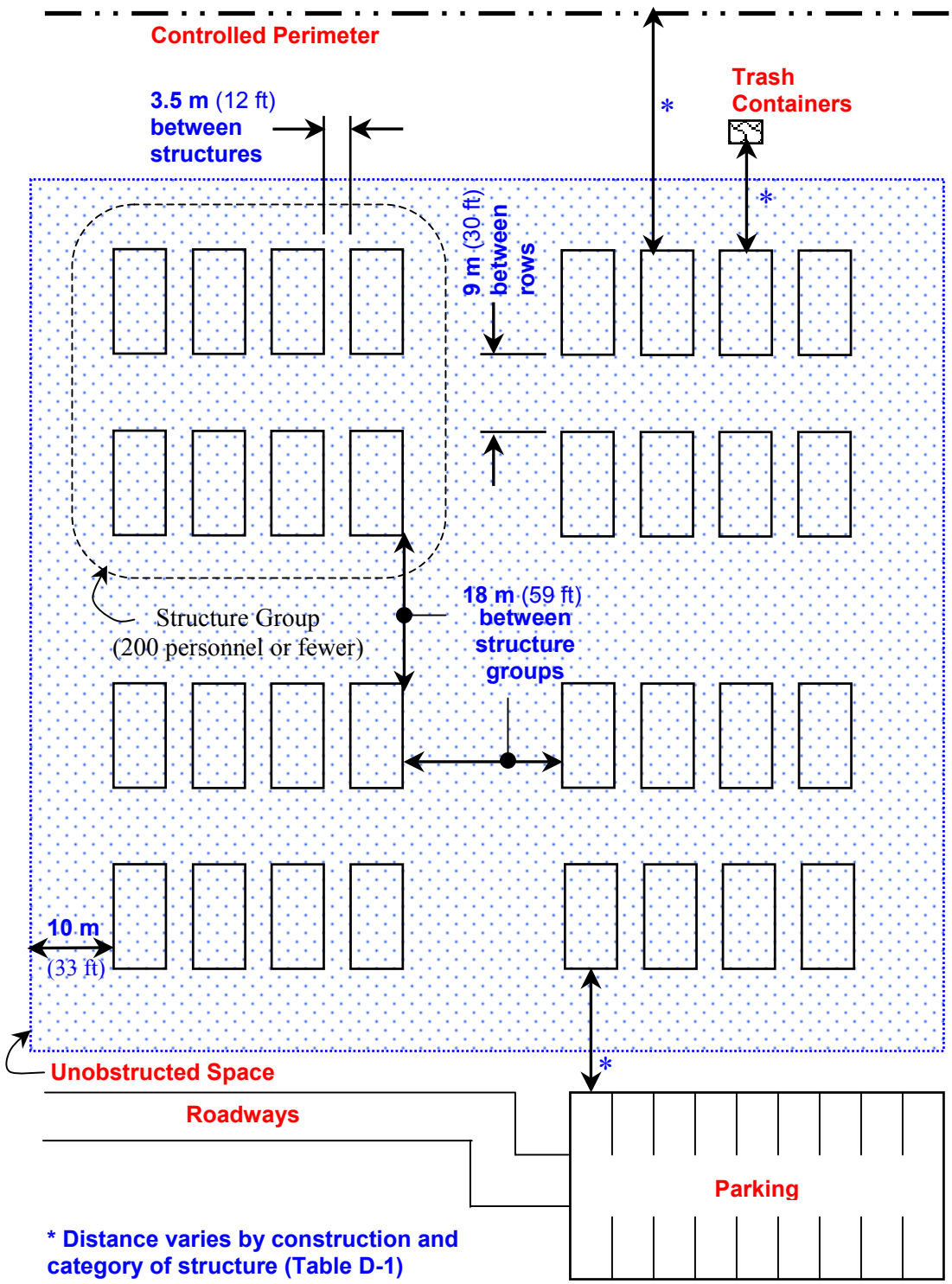
D-3 **ANTITERRORISM RECOMMENDATIONS.** Apply all recommendations except for Recommendation 7 (Access control for family housing) and Recommendation 8 (Standoff for family housing) from Appendix C to all expeditionary and temporary structures.

Table D-1 Minimum Standoff Distances and Separation for Expeditionary and Temporary Structures

Location	Structure Category	Standoff Distance or Separation Requirements			
		Applicable Level of Protection	Fabric Covered/Metal Frame Structures(1)	Other Expeditionary and Temporary Structures(1)(2)	Applicable Explosive Weight (TNT) (3)
Controlled Perimeter or Parking and Roadways without a Controlled Perimeter	Billeting	Low	31 m (102 ft.)	71 m (233 ft.)	**I**
	Primary Gathering Structure	Low	31 m (102 ft.)	71 m (233 ft.)	**I**
	Inhabited Structure	Very Low	24 m (79 ft.)	47 m (154 ft.)	**I**
Parking and Roadways within a Controlled Perimeter	Billeting	Low	14 m (46 ft.)	32 m (105 ft.)	**II**
	Primary Gathering Structure	Low	14 m (46 ft.)	32 m (105 ft.)	**II**
	Inhabited Structure	Very Low	10 m (33 ft.)	23 m (75 ft.)	**II**
Trash Containers	Billeting	Low	14 m (46 ft.)	32 m (105 ft.)	**II**
	Primary Gathering Structure	Low	14 m (46 ft.)	32 m (105 ft.)	**II**
	Inhabited Structure	Very Low	10 m (33 ft.)	23 m (75 ft.)	**II**
Structure Separation(4)	Separation between Structure Groups	Low	18 m (59 ft.)	18 m (59 ft.)	**III**(5)
	Separation between Structure Rows	Low	9 m (30 ft.)	9 m (30 ft.)	**III** (5)
	Separation between Structures in a Row	Very Low	3.5 m (12 ft.)	3.5 m (12 ft.)	**III**(5)

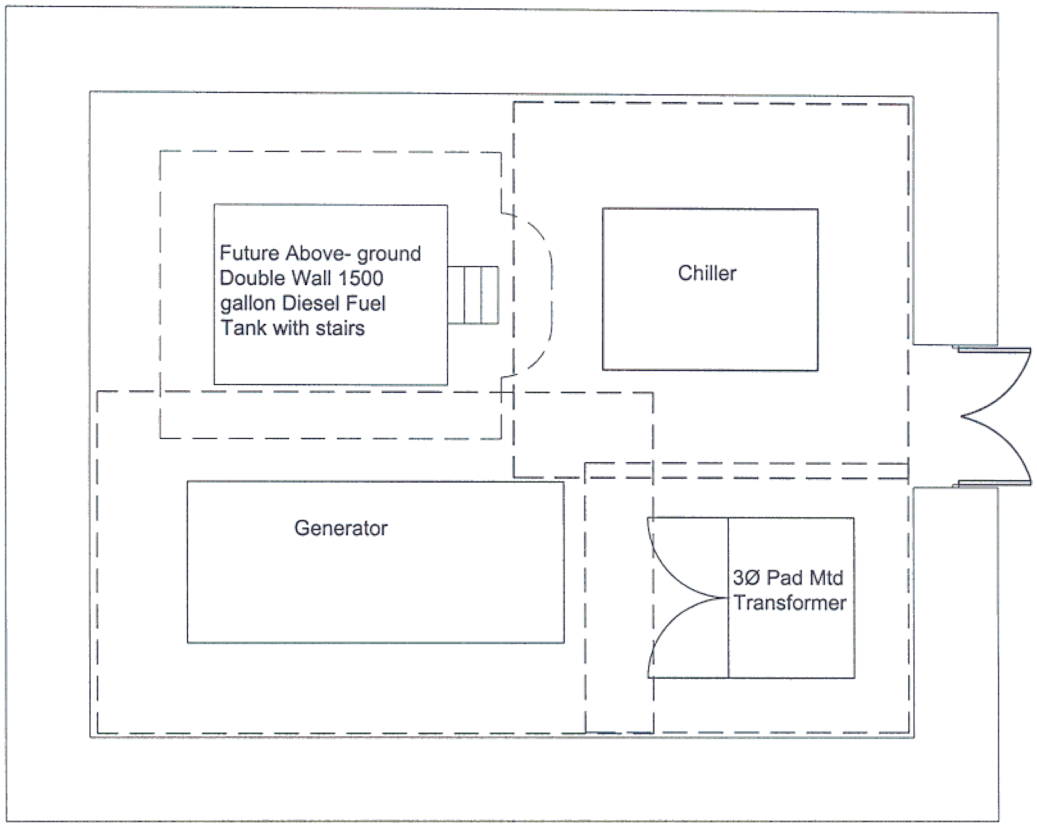
(1) See Definitions for a complete description of these structure types.
(2) For container structures, Appendix B applies.
(3) See UFC 4-010-10, for the specific explosive weights (kg/pounds of TNT) associated with designations – I, II, III. UFC 4-010-10 is For Official Use Only (FOUO)
(4) Applies to Billeting and Primary Gathering Structures only. No minimum separation distances for other inhabited structures.
(5) Explosive for building separation is an indirect fire (mortar) round.

Figure D-1 Standoff Distances and Separation for Expeditionary and Temporary Structures



ATTACHMENT 12
Equipment Yard

46'x36' MINIMUM EQUIPMENT YARD:
Ft. Lee - Fire & Emergency Services Center (Phase I & II)



Equipment Yard General Notes:

1. Provide maintenance and safety clearances around equipment as per manufacturer recommendations

2. Provide double swing iron gate as per Installation Design Guide. Include locking mechanism.

3. Provide mechanical equipment yard cover to comply with Force Protection and Anti-Terrorism Considerations.

END