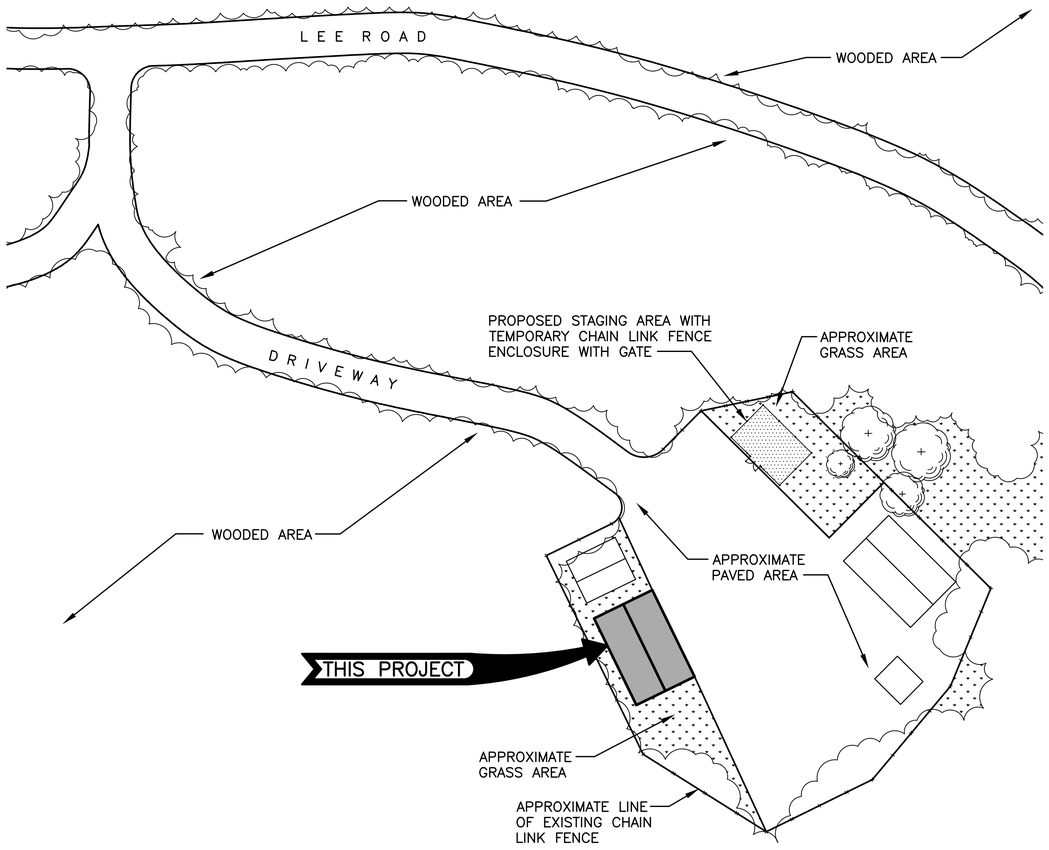
FRSP # 143495 - ARCHIVAL STORAGE FACILITY



PROJECT LOCATION

400 0 400 800

SCALE OF FEET

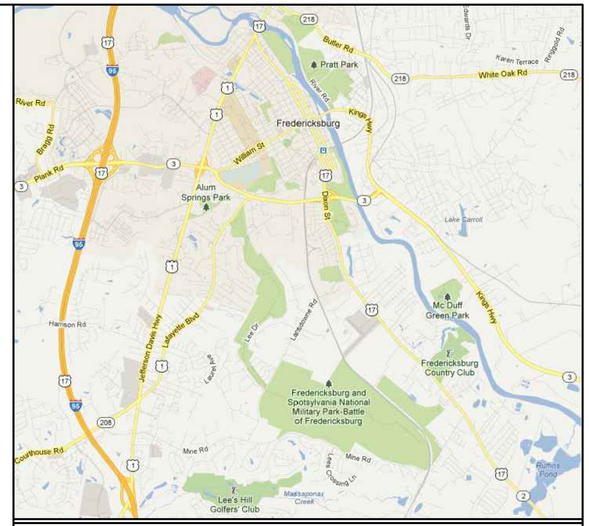
LIST OF DRAWINGS

SHEET	SUB SHEET	TITLE OF SHEET
1	–	COVER SHEET
Architectural Drawings		
3	A1	FLOOR PLAN AND ELEVATIONS
4	A2	BUILDING SECTIONS AND DETAILS
5	A3	DETAILS
6	A4	SPECIFICATIONS
7	A5	SPECIFICATIONS
8	A6	SPECIFICATIONS
Mechanical Drawings		
9	M1	MECHANICAL PLAN, LEGEND AND SCHEDULES
10	M2	MECHANICAL SPECIFICATIONS
Electrical Drawings		
11	E1	ELECTRICAL PLAN, LEGEND AND SCHEDULES
12	E2	ELECTRICAL SPECIFICATIONS

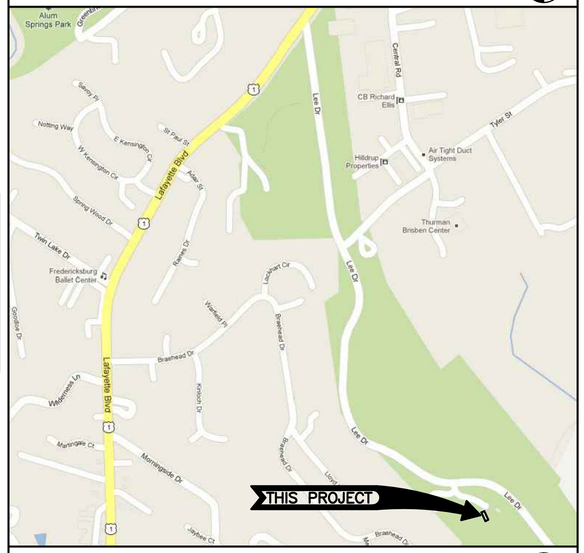
DEDUCT ALTERNATES:

DEDUCT ALTERNATE NO. 1:
DELETE BI–LEVEL CEILING WITHIN STORAGE ENCLOSURE AND ASSOCIATED SUPPORTING STRUCTURE, PROVIDE UNIFORM CEILING ELEVATION AT 7'–10" CLEAR INSIDE.

DEDUCT ALTERNATE NO. 2:
DELETE TRENCH DRAIN AND ASSOCIATED STORM WATER DRAINAGE PIPING.



SITE VICINITY MAP



SITE LOCATION MAP

FREDERICKSBURG AND SPOTSYLVANIA NATIONAL MILITARY PARK

100% CONSTRUCTION DOCUMENTS
05/14/2013

EYP, AE – C4526101001	Mark	Sheet	REVISION	Date	Initial
PRIME/ A.E: EYP ARCHITECTURE & ENGINEERING, INC. ALBANY, NEW YORK					

QUALITY DESIGN CERTIFICATION

- ☐ Prepared in Accordance with Design Development (Title I) _____ Drawing No.
  OR
- ☐ Variance from Design Development (Title I) Approved by Superintendent on _____ Date
  OR
- ☐ Construction Drawing Not Preceded by Design Development (Title I)

_____ Project Manager _____ Date

CONSTRUCTION DRAWINGS

UNITED STATES
DEPARTMENT OF THE INTERIOR

NATIONAL PARK SERVICE
DENVER SERVICE CENTER

TITLE OF PROJECT
FRSP # 143495– ARCHIVAL STORAGE FACILITY
LOCATION WITHIN PARK
FREDERICKSBURG, VIRGINIA
NAME OF PARK
FREDERICKSBURG AND SPOTSYLVANIA NMP
REGION: NORTH ATLANTIC | COUNTY: INDEPENDENT CITY | STATE: VIRGINIA

DRAWING NO. _____
PMIS/PKG NO. 143495
SHEET 1 OF 12

GENERAL REMOVAL NOTES:

1. CONTRACTORS MUST VISIT THE SITE AND BECOME FAMILIAR WITH THE SCOPE OF REMOVAL WORK. CONTRACTOR SHALL FAMILIARIZE THEMSELVES WITH THE EXTENT AND INTENT OF THE NEW CONSTRUCTION AND SHALL COORDINATE ALL REMOVAL WORK WITH WORK TO REMAIN AND NEW WORK.
2. CONTRACTOR SHALL PROTECT FROM DAMAGE ANY ASSEMBLIES OR EQUIPMENT WHICH ARE NOT DESIGNATED TO BE REMOVED.
3. CONTRACTOR TO PROVIDE TEMPORARY ENCLOSURES AROUND AREAS OF CONSTRUCTION TO PROTECT ADJACENT OCCUPIED SPACES WHERE APPLICABLE.
4. PATCH ANY EXISTING WALL, FLOOR OR CEILING SURFACES TO REMAIN THAT ARE AFFECTED BY THE REMOVAL WORK. PATCH WITH MATERIAL TO MATCH EXISTING TO THE SATISFACTION OF THE ARCHITECT.

KEYED REMOVAL NOTES:

(1) — REMOVE EXISTING DOOR, DOOR FRAME, ASSOCIATED WOOD TRIM AND HARDWARE COMPLETE

(2) — REMOVE PORTION OF EXISTING FRAMED INFILL WALL CONSTRUCTION, WALL REMOVAL TO ±7'-2" AFF

(3) — REMOVE EXISTING OVERHEAD DOOR COMPLETE, REMOVALS INCLUDE BUT ARE NOT LIMITED TO TRACK/GUIDE ASSEMBLY AND SUPPORT, WOOD CASING/TRIM, SUPPORT BRACKETS AND HARDWARE.

(4) — REMOVE EXISTING ELECTRICAL PANEL, EXISTING CONDUIT FEEDER TO REMAIN, COORDINATE WITH ELECTRICAL DRAWING E1.

KEYED NOTES CONTINUED:

7 — (2) EMPTY J-BOXES AND CONDUITS TO TOP OF ENCLOSURE BY MODULAR PRE-FABRICATED STORAGE ENCLOSURE MANUFACTURER.

8 — (1) STANDARD LIGHT SWITCH ON EXTERIOR OF ENCLOSURE BY MODULAR PRE-FABRICATED STORAGE ENCLOSURE MANUFACTURER.

9 — (12) STANDARD TWO LAMP 4'-0" LONG FLUORESCENT LIGHT FIXTURES BY MODULAR PRE-FABRICATED STORAGE ENCLOSURE MANUFACTURER.

10 — NEW ELECTRICAL SERVICE PANEL, SEE ELECTRICAL DWGS.

11 — NEW ASPHALT LANDING AND RAMP WITH SPLAYED SIDES ON COMPACTED GRAVEL, COORDINATE WITH EXISTING GRADE ELEVATIONS, FIELD VERIFY.

12 — NEW LIGHT SWITCH ON EXTERIOR OF ENCLOSURE BY MODULAR PREFABRICATED STORAGE ENCLOSURE MANUFACTURER.

13 — NEW PULL BOX, SEE ELECTRICAL DWGS.

GENERAL NOTES:

1. DO NOT SCALE DRAWINGS. DIMENSIONAL DISCREPANCIES AND QUESTIONS SHALL BE DIRECTED TO THE ARCHITECT.
2. ALL DIMENSIONS SHOWN ARE FEET AND INCHES UNLESS NOTED OTHERWISE. DIMENSIONS INDICATED WITH (±) REQUIRE FIELD VERIFICATION BY THE CONTRACTOR.
3. ANY FIELD CONDITIONS NOT CORRESPONDING TO THE DRAWINGS SHALL IMMEDIATELY BE COORDINATED WITH THE ARCHITECT.
4. THESE DRAWINGS ARE PREPARED AND COORDINATED WITH THE PROJECT MANUAL WHICH INCLUDES TECHNICAL SPECIFICATIONS, TOGETHER THESE FORM THE CONSTRUCTION DOCUMENTS.
5. PATCH EXISTING CONCRETE FLOOR SLAB IN AREA OF NEW STORAGE ENCLOSURE AS REQUIRED TO ENSURE A LEVEL SURFACE, FIELD VERIFY.

KEYED NOTES:

1 — PROVIDE NEW PAINTED INSULATED FLUSH HOLLOW METAL DOOR PAIR, 1 3/4" THICK X 6'-0" WIDE X 7'-0" HIGH IN NEW PAINTED GALVANIZED DOOR FRAME WITH 1/2" HIGH (MAX.) ALUMINUM DOOR THRESHOLD AND FULL WEATHER STRIPPING. NOTE: FIELD VERIFY/CONFIRM FRAME THROAT DIMENSION WITH NEW WALL INFILL THICKNESS.

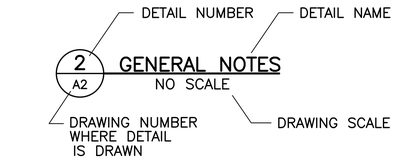
2 — PROVIDE NEW WALL INFILL AT REMOVED OVERHEAD DOOR OPENING. INFILL CONSTRUCTION TO MATCH ADJACENT EXISTING WALL CONSTRUCTION, FIELD VERIFY. ASSUME 1/2"± PAINTED GYPSUM BOARD INTERIOR FINISH, VAPOR RETARDER, 2 ROWS 2 X 4 WOOD STUDS @ 16" O.C., R13 UN-FACED FIBERGLASS BATT INSULATION IN STUD CAVITIES, AIR INFILTRATION BARRIER AND 1/2"± EXTERIOR GRADE PLYWOOD PAINTED TO MATCH EXISTING ADJACENT WALL FINISH.

3 — NEW MODULAR PRE-FABRICATED STORAGE ENCLOSURE, SINGLE COMPARTMENT WITH FLOOR. 4" THICK CEILING PANELS, FLOOR PANELS AND WALL PANELS.

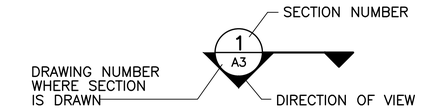
4 — NEW 6'-0" WIDE X 7'-0" HIGH PAIR ENTRY DOOR BY MODULAR PRE-FABRICATED STORAGE ENCLOSURE MANUFACTURER.

5 — NEW 4" RAISED PLATFORM BY MODULAR PRE-FABRICATED STORAGE ENCLOSURE MANUFACTURER. PLATFORM PANELS SAME AS ENCLOSURE FLOOR PANELS, ALL TO RECEIVE RESILIENT ANTI-SLIP SAFETY FLOORING. RESILENT FLOORING NOT BY ENCLOSURE MANUFACTURER.

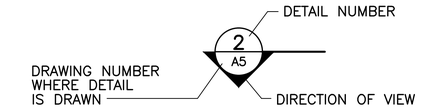
6 — NEW REMOVABLE 3'-4" HIGH 1 1/4" NOMINAL DIAMETER PAINTED SCHEDULE 40 STEEL PIPE RAIL WITH 3/8" THICK STEEL BASE PLATE. ANCHORED TO EXISTING CONCRETE FLOOR SLAB USING (2) 5/8" DIA. EXPANSION ANCHORS PER BASE PLATE, 4" MIN. EMBEDMENT. SEE DETAILS ON DRAWING A2.



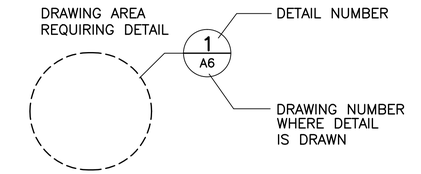
DETAIL TITLE ON DETAIL DRAWING



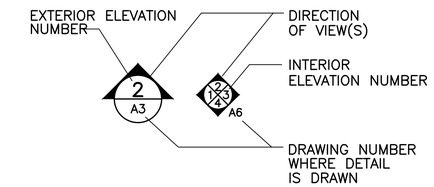
SECTION INDICATION



DETAIL / SECTION INDICATION



DETAIL INDICATION



ELEVATION INDICATORS

(1) — REMOVALS KEY NOTE

====== — EXISTING ITEM TO BE REMOVED

2 — NEW WORK KEY NOTES

△2 — REVISION NUMBER

1 / A8 — DETAIL OR SECTION

1 / A0 ARCHITECTURAL SYMBOL LEGEND

3 / A0 GENERAL/KEYED REMOVAL AND NEW WORK NOTES

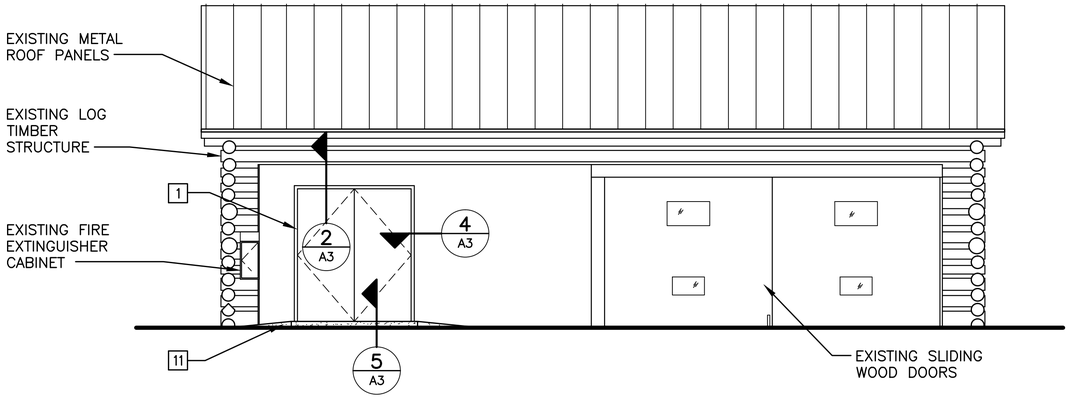
ACOUS	ACOUSTICAL
ADJ	ADJACENT
AFF	ABOVE FINISHED FLOOR
ALUM	ALUMINUM
APPD	APPROVED
ARCH	ARCHITECT(URE,URAL)
ASPH	ASPHALT
BLDG	BUILDING
BLKG	BLOCKING
BOT	BOTTOM
BRK	BRICK
BUR	BUILT-UP ROOF
C	CONDUIT
CI	CAST IRON
CJ	CONTROL JOINT
CLG	CEILING
CLL	CONTRACT LIMIT LINE
CLR	CLEAR(ANCE)
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
CONC	CONCRETE
CONT	CONTINU(OUS, ATION)
COORD	COORDINATE
CRS	COURSE
D	DRAIN
DEMO	DEMOLISH
DET	DETAIL
DIA	DIAMETER
DIM	DIMENSION
DOT	DEPARTMENT OF TRANSPORTATION
DWG	DRAWING
EA	EACH
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRICAL
ELEV	ELEVATOR OR ELEVATION
EP	ELECTRICAL PANEL BOARD
EQ	EQUAL
EQPT	EQUIPMENT
ETR	EXISTING TO REMAIN
EXIST	EXISTING
EXP	EXPANSION
FE	FIRE EXTINGUISHER
FF	FINISHED FLOOR
FIN	FINISH(ED)
FL, FLR	FLOOR
FOB	FACE OF BRICK
FOC	FACE OF CONCRETE
FT	FEET, FOOT
GA	GAGE
GALV	GALVANIZED
GWB	GYPSUM WALL BOARD
GYP	GYPSUM
HC	HOLLOW CORE
HDWD	HARDWOOD
HM	HOLLOW METAL
HOR	HORIZONTAL
HP	HIGH POINT
HT	HEIGHT
HWD	HARDWOOD
ID	INSIDE DIAMETER
IN	INCH
I.E.	THAT IS
INSUL	INSULAT(E, D, ION)
INT	INTERIOR
JB	JUNCTION BOX
JT	JOINT
LCC	LEAD COATED COPPER
LP	LOW POINT
LPDC	LIGHTNING PROTECTION DOWN CONDUCTOR
MAX	MAXIMUM
MECH	MECHANICAL
MIN	MINIMUM
MO	MASONRY OPENING
MTD	MOUNTED
N	NORTH
NIC	NOT IN CONTRACT
NOM	NOMINAL
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OPG	OPENING
OPP	OPPOSITE
OZ	OUNCE
P	POLE
PB	PULLBOX
PH	PHASE
PIL	PILASTER
PL	PLATE
PLAS	PLASTER
PLYWD	PLYWOOD
PNL	PANEL
PT	PRESSURE TREATED
PTD	PAINT(ED)
QTY	QUANTITY
R	RISER, RADIUS
RAD	RADIUS
RD	ROOF DRAIN
REFL	REFLECTED
REINF	REINFORCE(ED, MENT)
REQD	REQUIRED
RM	ROOM
RO	ROUGH OPENING
SC	SOLID CORE
SHED	SCHEDULE(D)
SECT	SECTION
SF	SQUARE FEET
SHT	SHEET
SIM	SIMILAR
SPEC	SPECIFICATIONS
SQ	SQUARE
SS	STAINLESS STEEL
STD	STANDARD
STL	STEEL
STRUCT	STRUCTURAL
SUSP	SUSPENDED
T/	TOP OF
T&B	TOP & BOTTOM
TEL	TELEPHONE
THK	THICK(NESS)
THR	THRESHOLD
TOS	TOP OF SLAB
TOW	TOP OF WALL
TPO	THERMOPLASTIC POLYOLEFIN
TYP	TYPICAL
UL	UNDERWRITERS LABORATORIES
UNFIN	UNFINISHED
UNO	UNLESS NOTED OTHERWISE
VAR	VARIES
VERT	VERTICAL
VIF	VERIFY IN FIELD
W/	WITH
W/O	WITHOUT
WD	WOOD
WP	WATERPROOF / WORKING POINT
WWF	WELDED WIRE FABRIC

4 / A0 ARCHITECTURAL ABBREVIATIONS

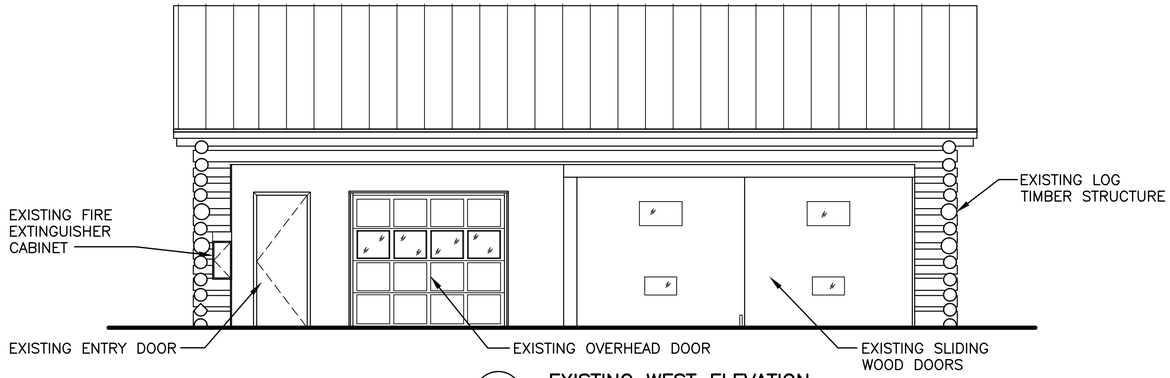
EARTH	GRANULAR FILL
BRICK	PLYWOOD
CONCRETE	FINISH WOOD
CONCRETE MASONRY UNITS	RIGID INSULATION
GYPSUM WALLBOARD OR GROUT	BATT INSULATION
ROUGH WOOD BLOCKING	STEEL
	EXISTING CONSTRUCTION

2 / A0 MATERIAL INDICATIONS

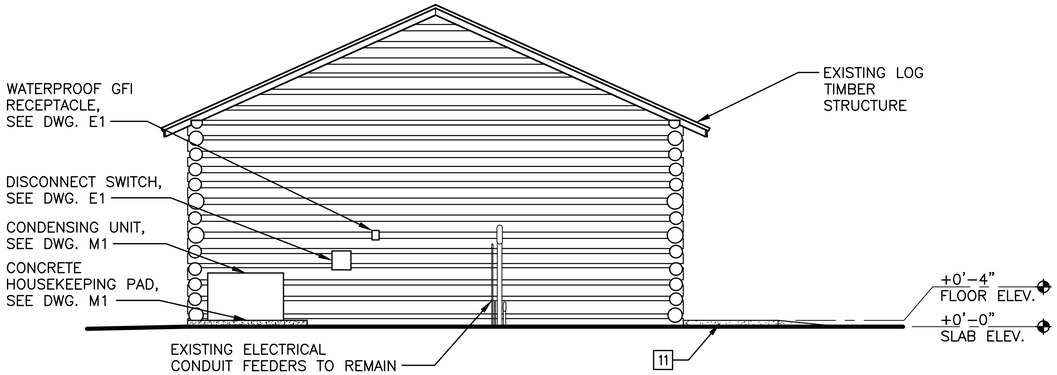
DESIGNED: CV	SUB SHEET NO.	TITLE OF SHEET	DRAWING NO.
CADD: CV	A0	NOTES, SYMBOLS AND ABBREVIATIONS	PMIS/PKG NO. 143495
TECH. REVIEW: PS		FREDERICKSBURG AND SPOTSYLVANIA NATIONAL MILITARY PARK, VIRGINIA	SHEET 2 OF 12
DATE: 05/14/2013			



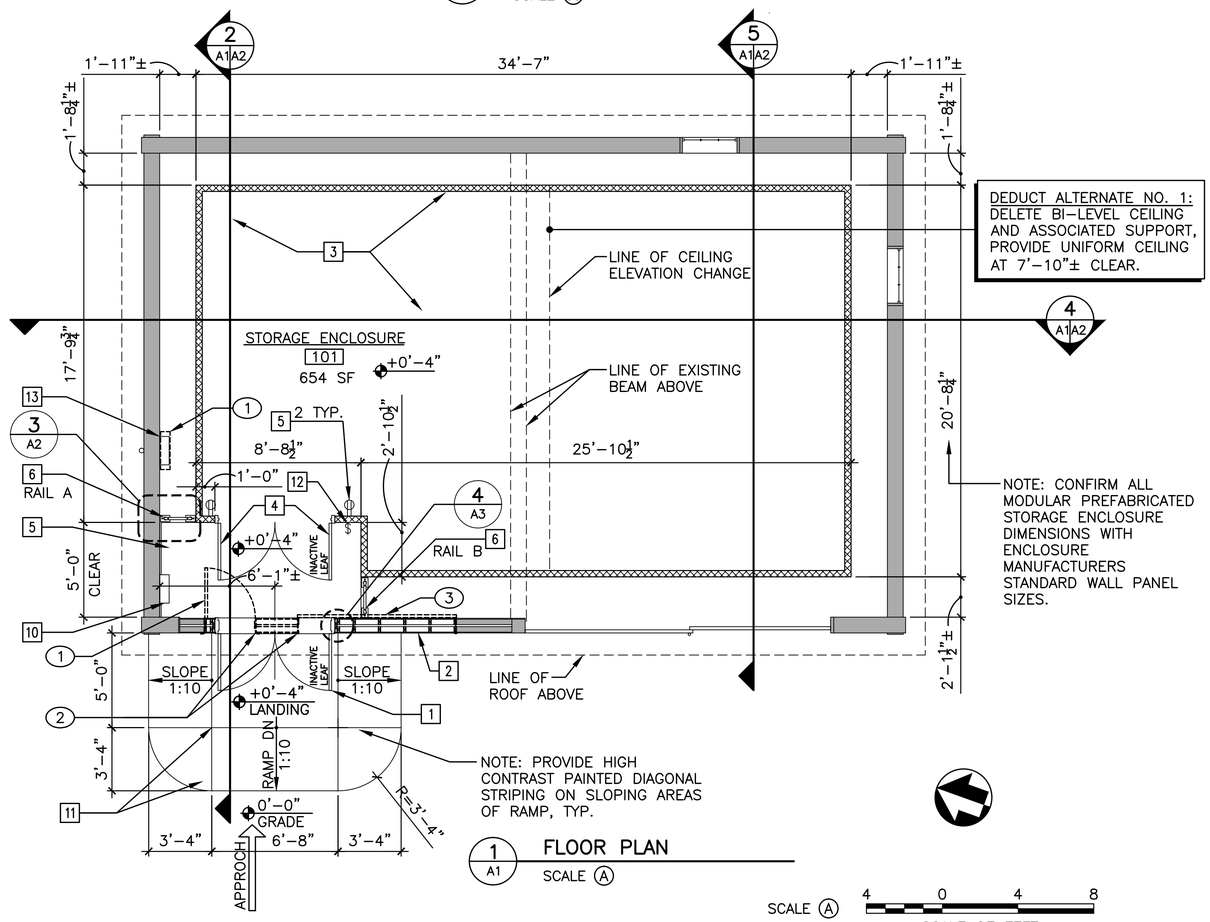
4 A1 NEW WEST ELEVATION
SCALE (A)



2 A1 EXISTING WEST ELEVATION
SCALE (A)



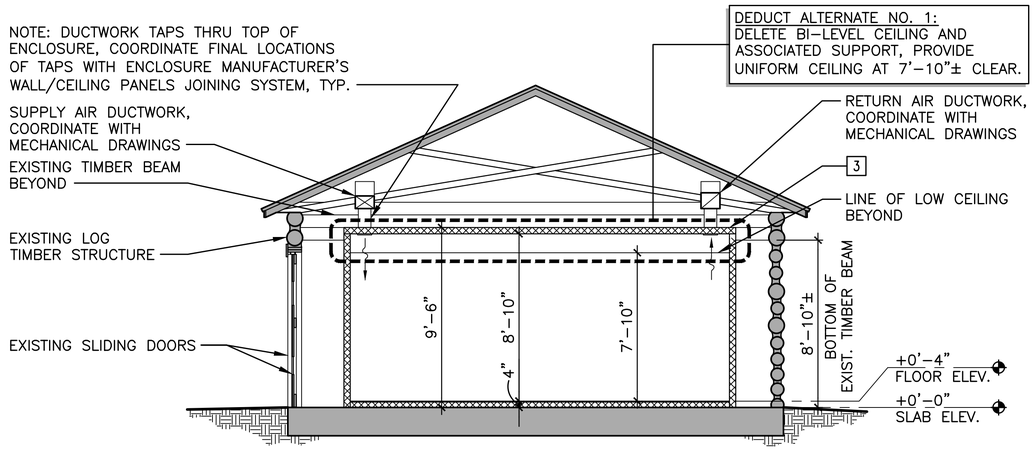
3 A1 NORTH ELEVATION
SCALE (A)



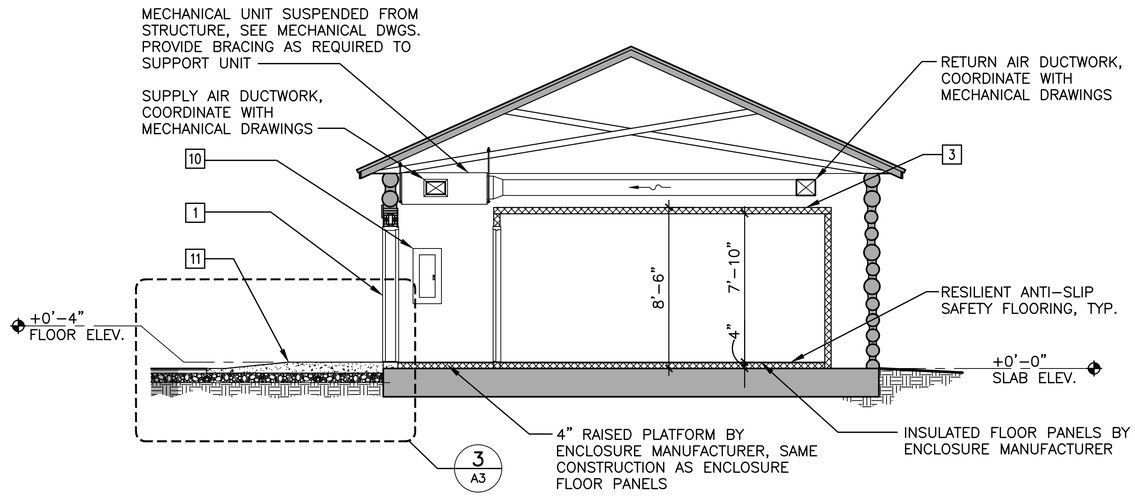
1 A1 FLOOR PLAN
SCALE (A)

SCALE (A) 4 0 4 8
SCALE OF FEET

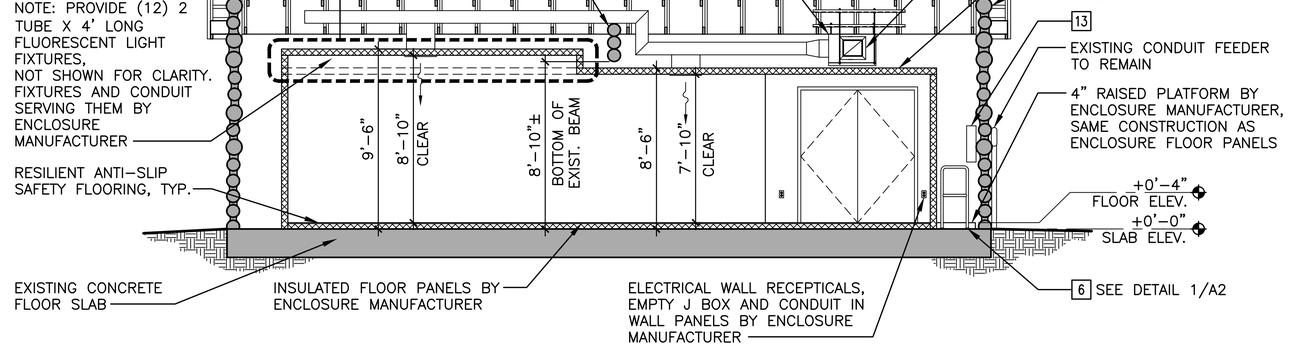
DESIGNED: CV DRAWN: CV TECH. REVIEW: DATE: 05/14/2013	SUB SHEET NO. A1	TITLE OF SHEET FLOOR PLAN AND ELEVATIONS FREDERICKSBURG AND SPOTSYLVANIA NATIONAL MILITARY PARK, VIRGINIA	DRAWING NO. PMIS/PKG NO. 143495 SHEET 3 OF 12



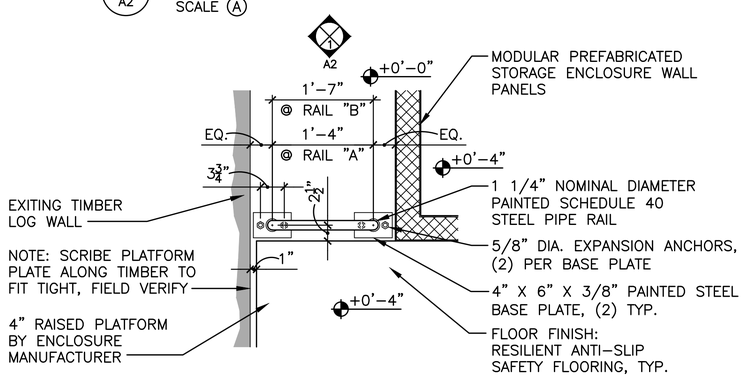
5 A2 BUILDING SECTION LOOKING NORTH
SCALE (A)



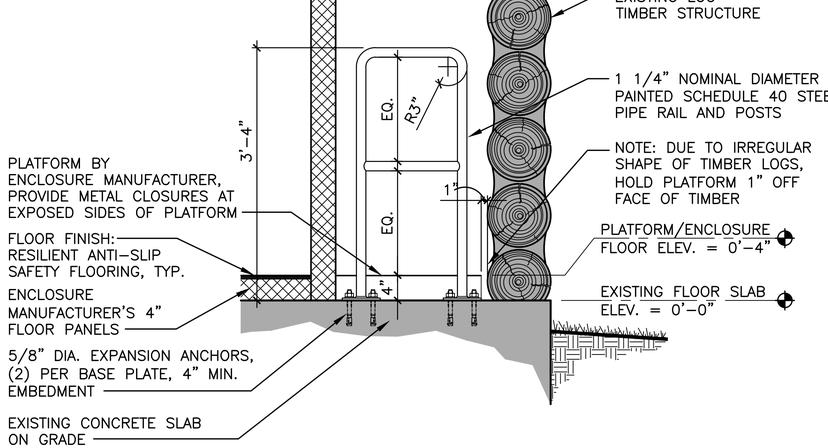
2 A2 BUILDING SECTION LOOKING NORTH
SCALE (A)



4 A2 LONGITUDNAL BUILDING SECTION LOOKING EAST
SCALE (A)



3 A2 PLAN DETAIL AT PIPE RAIL "A", PIPE RAIL "B" SIMILAR
SCALE (A)

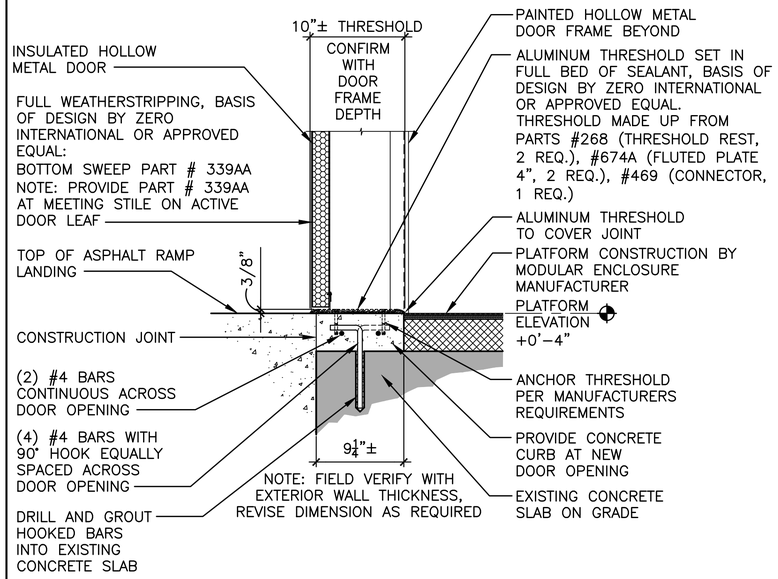


1 A2 SECTION/ELEVATION AT PIPE RAIL
SCALE (A)

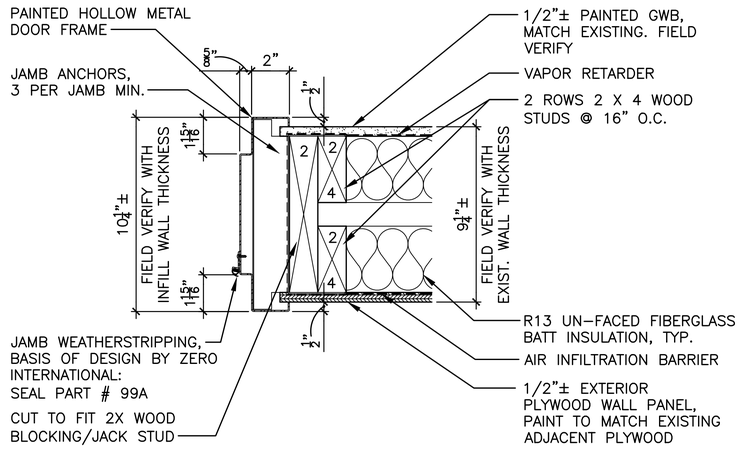
SCALE (A) 4 0 4 8
SCALE OF FEET

SCALE (B) 1 0 1 2
SCALE OF FEET

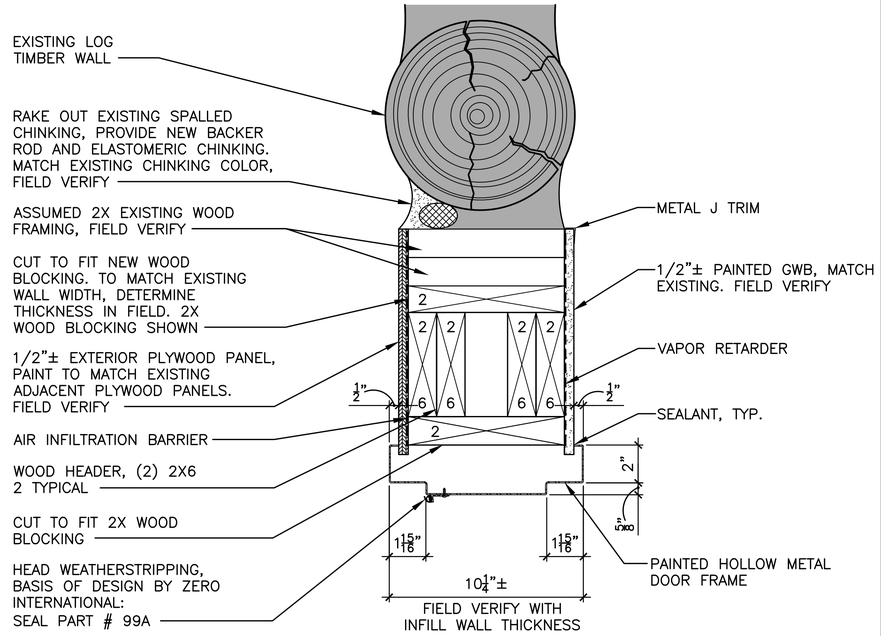
DESIGNED: CV DRAWN: CV TECH. REVIEW: DATE: 05/14/2013	SUB SHEET NO. A2	TITLE OF SHEET BUILDING SECTIONS AND DETAILS FREDERICKSBURG AND SPOTSYLVANIA NATIONAL MILITARY PARK, VIRGINIA	DRAWING NO. PMIS/PKG NO. 143495 SHEET 4 OF 12



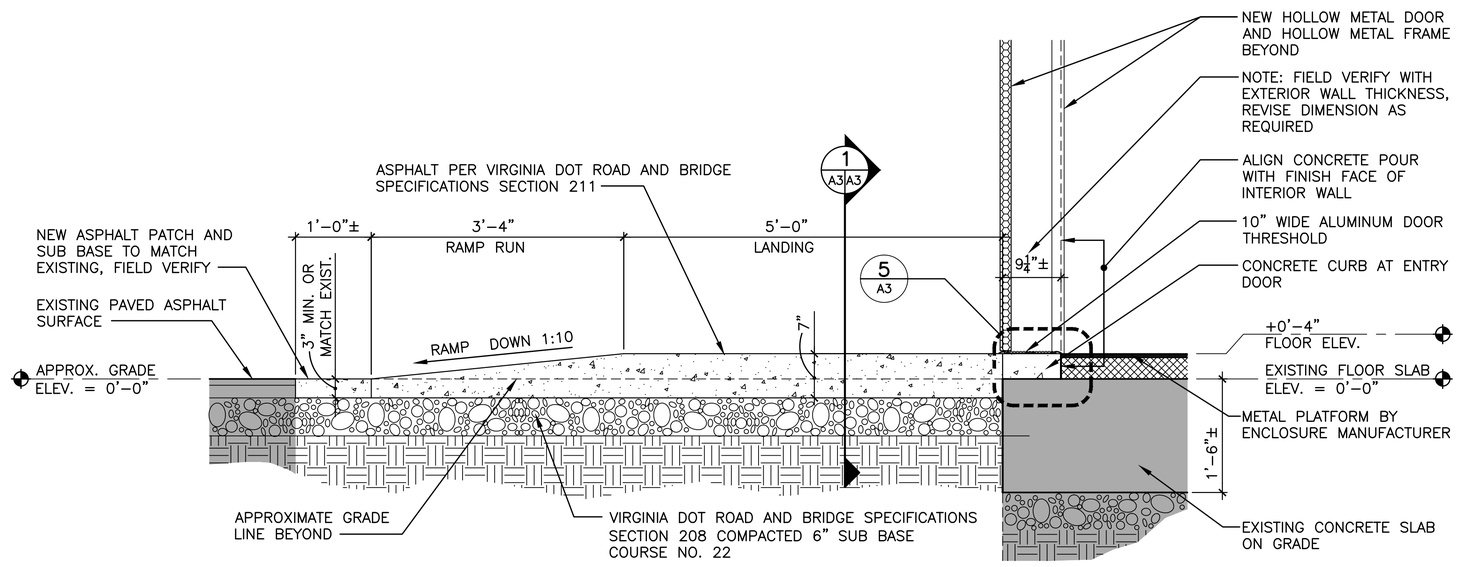
5 / A3 SILL DETAIL AT NEW ENTRY DOOR
SCALE Ⓓ



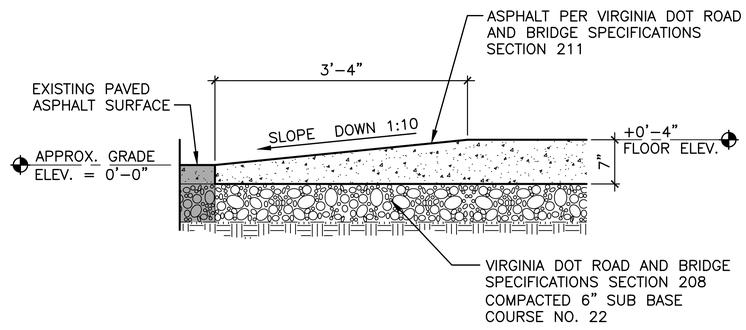
4 / A3 JAMB DETAIL AT NEW ENTRY DOOR
SCALE Ⓒ



2 / A3 HEAD DETAIL AT NEW ENTRY DOOR
SCALE Ⓒ



3 / A3 SECTION AT NEW ENTRY RAMP
SCALE Ⓑ



1 / A3 SECTION AT NEW ENTRY RAMP HANDRAIL
SCALE Ⓑ

SCALE Ⓑ 1 0 1 2 SCALE OF FEET
SCALE Ⓒ 6 3 0 6 SCALE OF INCHES
SCALE Ⓓ 12 6 0 12 SCALE OF INCHES

DESIGNED: CV DRAWN: PS TECH. REVIEW: DATE: 05/14/2013	SUB SHEET NO. A3	TITLE OF SHEET: DETAILS FREDERICKSBURG AND SPOTSYLVANIA NATIONAL MILITARY PARK, VIRGINIA	DRAWING NO. PMIS/PKG NO. 143495 SHEET 5 OF 12

SECTION 033053 - MISCELLANEOUS CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes cast-in-place concrete, including reinforcement, concrete materials, mixture design, placement procedures, and finishes.

1.2 SUBMITTALS

A. Design Mixtures: For each concrete mixture.

1.3 QUALITY ASSURANCE

A. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94 requirements for production facilities and equipment.

B. Comply with ACI 301.

C. Comply with ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

PART 2 - PRODUCTS

2.1 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615, Grade 60 deformed.

2.2 CONCRETE MATERIALS

A. Cementitious Material: Portland cement, ASTM C 150, Type I or Type III.

B. Normal-Weight Aggregate: ASTM C 33, graded, 1-1/2-inch nominal maximum aggregate size.

C. Water: ASTM C 94.

2.3 ADMIXTURES

A. Air-Entraining Admixture: ASTM C 260.

B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

2.4 RELATED MATERIALS

A. Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber, or ASTM D 1752, cork or self-expanding cork.

2.5 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming; manufactured for application to fresh concrete.

B. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

2.6 CONCRETE MIXTURES

A. Normal-Weight Concrete: Prepare design mixes, proportioned according to ACI 301, as follows:

1. Minimum Compressive Strength: 3500 psi at 28 days.
2. Maximum Water-Cementitious Materials Ratio: 0.45.
3. Slump Limit: 4 inches, plus or minus 1 inch.
4. Air Content: Maintain within range permitted by ACI 301. Do not allow air content of trowel-finished floor slabs to exceed 3 percent.

2.7 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94, and furnish batch ticket information.

1. When air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

3.2 STEEL REINFORCEMENT

A. Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

3.3 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Isolation (Construction) Joints: Install joint-filler strips at junctions with slabs-on-grade and vertical surfaces and other locations, as indicated.

1. Extend joint fillers full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.

3.4 CONCRETE PLACEMENT

A. Comply with ACI 301 for placing concrete.

B. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.

C. Consolidate concrete with mechanical vibrating equipment.

3.5 FINISHING UNFORMED SURFACES

A. General: Comply with ACI 302.1R for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Screed surfaces with a straightedge and strike off. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane before excess moisture or bleedwater appears on surface.

1. Do not further disturb surfaces before starting finishing operations.

C. Nonslip Broom Finish: Apply a nonslip broom finish to surfaces indicated and to exterior concrete platforms, steps, and ramps. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.

3.6 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and with ACI 301 for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

D. Curing Methods: Cure formed and unformed concrete for at least seven days by one or a combination of the following methods:

1. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.7 FIELD QUALITY CONTROL

A. Testing Agency: Government may engage a qualified testing agency to perform tests and inspections.

B. Tests: Perform according to ACI 301.

1. Testing Frequency: One composite sample shall be obtained for each day's pour of each concrete mix exceeding 5 cu. yd. but less than 25 cu. yd., plus one set for each additional 50 cu. yd. (38 cu. m) or fraction thereof.
2. Testing Frequency: One composite sample shall be obtained for each 100 cu. yd. or fraction thereof of each concrete mix placed each day.

3.8 REPAIRS

A. Remove and replace concrete that does not comply with requirements in this Section.

END OF SECTION 033053

SECTION 055000 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Metal bollards.
2. Steel pipe railings.

1.2 SUBMITTALS

A. Product Data: For the following:

1. Paint products.
2. Grout.

B. Shop Drawings for Pipe Railings: Include plans, elevations, sections, details, and attachments to other work.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Performance: Railings, including attachment to building construction, shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Top Rails of Guards:
   a. Uniform load of 50 lbf/ ft. applied in any direction.
   b. Concentrated load of 200 lbf applied in any direction.
   c. Uniform and concentrated loads need not be assumed to act concurrently.
2. Infill of Guards:
   a. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft.
   b. Infill load and other loads need not be assumed to act concurrently

2.2 METALS

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

B. Steel Plates, Shapes, and Bars: ASTM A 36.

C. Steel Pipe: ASTM A 53, Standard Weight (Schedule 40).

1. Provide Type F or Type S, Grade A for steel pipe railings.
2. Provide galvanized finish for pipe railings.

2.3 FASTENERS

A. General: Unless otherwise indicated, provide Type 304 stainless-steel fasteners for exterior use. Select fasteners for type, grade, and class required.

2.4 MISCELLANEOUS MATERIALS

A. Shop Primer for Galvanized Steel Railing: Primer formulated for exterior use over zinc-coated metal and compatible with finish paint systems indicated.

B. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

2.5 FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Use connections that maintain structural value of joined pieces.

B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges. Remove sharp or rough areas on exposed surfaces.

C. Weld corners and seams continuously to comply with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended.

D. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Locate joints where least conspicuous.

E. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

2.6 FINISHES, GENERAL

A. Finish metal fabrications after assembly.

B. Galvanized Railings:

1. Hot-dip galvanize steel railings, including hardware, after fabrication.
2. Comply with ASTM A 123/A 123M for hot-dip galvanized railings.
3. Comply with ASTM A 153/A 153M for hot-dip galvanized hardware.

C. Preparing Galvanized Railings for Shop Priming: After galvanizing, thoroughly clean railings of grease, dirt, oil, flux, and other foreign matter, and treat with etching cleaner.

D. Primer Application: Apply shop primer to prepared surfaces of railings unless otherwise indicated. Comply with requirements in SSPC-PA 1, "Shop, Field, and Maintenance Painting of Steel," for shop painting. Primer need not be applied to surfaces to be embedded in concrete.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations.

3.2 INSTALLING PIPE RAILINGS

A. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.

1. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
2. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.

B. Anchoring Posts: Form or core-drill holes not less than 5 inches deep and 3/4 inch larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions.

3.3 INSTALLING METAL BOLLARDS

A. Anchor bollards in place with concrete footings. Place concrete and vibrate or tamp for consolidation. Support and brace bollards in position until concrete has cured.

B. Fill bollards solidly with concrete, mounding top surface to shed water.

END OF SECTION 055000

SECTION 061053 - MISCELLANEOUS ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Dimension lumber framing and blocking.
2. Exterior plywood wall panel.
3. Air infiltration barrier.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. Factory mark each piece of lumber with grade stamp of grading agency. Provide dressed lumber, S4S, unless otherwise indicated.

B. Maximum Moisture Content of Lumber: 19 percent.

2.2 DIMENSION LUMBER

A. Framing and Blocking: Construction or No. 2 grade and any of the following species:

1. Hem-fir (north); NLGA.
2. Southern pine; SPIB.
3. Douglas fir-larch; WCLIB or WWPA.

2.3 EXTERIOR PLYWOOD WALL PANEL

A. Plywood Wall Panel: DOC PS-2,.Exterior Grade B-B, MDO plywood, for paint finish.

2.4 AIR INFILTRATION BARRIER

A. Building Wrap: ASTM E 1677, Type I air barrier with water-vapor permeance not less than 50 g through 1 sq. m of surface in 24 hours per ASTM E 96/E 96M, Desiccant Method (Procedure A).

B. Building-Wrap Tape: Pressure-sensitive plastic tape recommended by building-wrap manufacturer for sealing joints and penetrations in building wrap.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry to other construction; scribe and cope as needed for accurate fit.

B. Install plywood wall panel by fastening to wood framing and blocking.

END OF SECTION 061053

DESIGNED: CV DADD PS TECH. REVIEW: DATE: 05/14/2013	SUB SHEET NO. A4	TITLE OF SHEET SPECIFICATIONS FREDERICKSBURG AND SPOTSYLVANIA NATIONAL MILITARY PARK, VIRGINIA	DRAWING NO. PMIS/PKG NO. 143495 SHEET 6 OF 12

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes hollow-metal work.

1.2 SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 EXTERIOR HOLLOW-METAL DOORS AND FRAMES

A. Extra-Heavy-Duty Doors and Frames: SDI A250.8, Level 3.

1. Physical Performance: Level A according to SDI A250.4.

2. Doors:

a. Face: Metallic-coated steel sheet, ASTM A 653/A 653M, Commercial Steel (CS), Type B minimum thickness of 0.053 inch, with minimum A40 coating.

3. Thermal-Rated Doors: Provide doors fabricated with R-value of not less than 2.1 deg F x h x sq. ft./Btu when tested according to ASTM C 1363.

4. Frames:

a. Materials: Metallic-coated steel sheet, ASTM A 653, Commercial Steel (CS), Type B, minimum thickness of 0.053 inch, with minimum A40 coating.

b. Construction: Face welded.

5. Exposed Finish: Factory primed.

2.2 DOOR HARDWARE

A. Plain Bearing Hinges: BHMA A156.1, template-produced hinges, Grade 3 (standard weight).

1. Mounting: Full mortise (butts).

2. Base and Pin Metal: Brass with stainless-steel pin body and brass protruding heads.

3. Pins: Nonremovable.

4. Tips: Flat button.

5. Corners: Square.

A. Mortise Locks: BHMA A156.13; Operational Grade 1; stamped steel case with steel or brass parts; Series 1000.

1. Backset: 2-3/4 inches.

2. Storeroom function.

B. Standard Lock Cylinders: BHMA A156.5; Grade 1; five-pin, permanent cores that are interchangeable; face finished to match lockset.

C. Surface Bolts: BHMA A156.16 on inactive leaf.

D. Astragal: Stainless steel lock-guard astragal on active leaf.

E. Coordinator: BHMA A156.3; consisting of active-leaf, hold-open lever and inactive-leaf release trigger; fabricated from steel with nylon-coated strike plates; with built-in, adjustable safety release.

F. Surface Closer with Cover: BHMA A156.4; rack-and-pinion hydraulic type with adjustable sweep and latch speeds, Grade 1; Modern Type parallel arm, with mechanism enclosed in cover.

2.3 FABRICATION

A. Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.

B. Hollow-Metal Doors:

1. Exterior Doors: Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.

C. Hollow-Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.

1. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.

D. Hardware Preparation: Factory prepare hollow-metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6 and templates.

1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

2. Comply with applicable requirements in SDI A250.6 and BHMA A156.115 for preparation of hollow-metal work for hardware.

2.4 STEEL FINISHES

A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.

1. Shop Primer: SDI A250.10.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Hollow-Metal Frames: Install hollow-metal frames of size and profile indicated. Comply with SDI A250.11 or NAAMM-HMMA 840 as required by standards specified.

1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.

a. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.

b. Install frames with removable stops located on secure side of opening.

2. Installation Tolerances: Adjust hollow-metal door frames for squareness, alignment, twist, and plumb to the following tolerances:

a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.

b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.

c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.

d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.

B. Hollow-Metal Doors: Fit hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.

1. Non-Fire-Rated Steel Doors:

a. Between Door and Frame Jambs and Head: 1/8 inch plus or minus 1/32 inch.

b. Between Edges of Pairs of Doors: 1/8 inch to 1/4 inch plus or minus 1/32 inch.

c. At Bottom of Door: 3/4 inch plus or minus 1/32 inch.

d. Between Door Face and Stop: 1/16 inch to 1/8 inch plus or minus 1/32 inch.

3.2 ADJUSTING AND CLEANING

A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow-metal work that is warped, bowed, or otherwise unacceptable.

B. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.

END OF SECTION 081113

SECTION 092900 - GYPSUM BOARD ASSEMBLY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Interior gypsum board.

2. Thermal insulation.

3. Vapor retarder.

1.2 SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 INTERIOR GYPSUM BOARD

A. Gypsum Wallboard: ASTM C 1396, with long edges tapered.

B. Steel Drill Screws: ASTM C 1002.

C. Trim Accessories: ASTM C 1047, galvanized or aluminum-coated steel sheet or rolled zinc.

D. Joint Treatment Materials: Comply with ASTM C 475.

1. Joint Tape: Paper.

2. Joint Compound for Interior Gypsum Board: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.

2.2 INSULATION

A. Unfaced, Glass-Fiber Blanket Insulation: ASTM C 665, Type I.

2.3 VAPOR RETARDER

A. Polyethylene Vapor Retarders: ASTM D 4397, 6 mils thick, with maximum permeance rating of 0.13 perm.

B. Vapor-Retarder Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.

PART 3 - EXECUTION

3.1 APPLYING AND FINISHING PANELS

A. Comply with ASTM C 840.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

C. Trim edges with edge trim where edges of panels are exposed. Attach to framing with same fasteners used for panels.

D. Prefill open joints and damaged surface areas.

E. Apply joint tape over gypsum board joints.

F. Gypsum Board Finish Levels: Finish panels to Level 4, according to ASTM C 840:

G. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.

H. Remove and replace panels that are wet, moisture damaged, and mold damaged.

3.2 INSULATION INSTALLATION

A. Extend insulation to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

B. For wood-framed construction, install blankets according to ASTM C 1320.

3.3 VAPOR RETARDER INSTALLATION

A. Place vapor retarders on side of construction indicated on Drawings. Extend vapor retarders to extremities of areas to protect from vapor transmission. Secure vapor retarders in place with adhesives or other anchorage system as indicated. Extend vapor retarders to cover miscellaneous voids in insulated substrates.

B. Seal vertical joints in vapor retarders over framing by lapping no fewer than two studs.

1. Fasten vapor retarders to wood framing at top, end, and bottom edges; at perimeter of wall openings; and at lap joints. Space fasteners 16 inches o.c.

C. Repair tears or punctures in vapor retarders immediately before concealment by other work. Cover with vapor-retarder tape or another layer of vapor retarders.

END OF SECTION 092900

SECTION 096516 - RESILIENT SHEET FLOORING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes slip-resistant, vinyl sheet flooring.

1.2 SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For each exposed product and for each color and texture specified in manufacturer's standard size, but not less than 6-by-9-inch sections.

C. Maintenance Data: For each type of resilient sheet flooring to include in maintenance manuals.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs workers for this Project who are competent in techniques required by manufacturer for resilient sheet flooring installation and seaming method indicated.

1.4 DELIVERY, STORAGE, AND HANDLING

Store resilient sheet flooring and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F. Store rolls upright.

1.5 FIELD CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 68 deg F or more than 80 deg F, in spaces to receive resilient sheet flooring during the following time periods:

1. 72 hours before installation.

2. During installation.

3. 24 hours after installation.

PART 2 - PRODUCTS

2.1 SLIP-RESISTANT, VINYL SHEET FLOORING

A. Slip-Resistant, Vinyl Sheet Flooring: ASTM F 1303, hard-wearing safety flooring with aluminium trioxide throughout the thickness of the material and silicon carbide at the surface .

1. Type (Binder Content): Type II, minimum binder content of 34 percent.

2. Wear-Layer Thickness: Grade 1.

3. Overall Thickness: 0.08 inch thick (2 mm).

4. Interlayer Material: None.

5. Backing Class: Class A (fibrous).

6. Weight 4.4 lbs / sq. yd

7. Warranty 10 years

8. Static Load Limit - ASTM F970 1000PSI

9. Slip Resistance - ASTM D2047 D .78, W .80

10. Critical Radiant Flux - ASTM E648 Pass

11. Smoke Generation - ASTM E662 Pass

12. Taber Abrasion - ASTM C501 Pass

B. Wearing Surface: Smooth with embedded abrasives.

C. Sheet Width: 6.6 feet.

D. Colors and Patterns: As selected by COR from full range of industry colors.

2.2 INSTALLATION MATERIALS

Adhesives: Water-resistant type recommended by flooring and adhesive manufacturers to suit resilient sheet flooring and metal substrate conditions indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

1. Examine metal substrates, with Installer present, for compliance with requirements for conditions affecting performance of the Work.

E. Verify that finishes of substrates comply with tolerances and other flooring manufacturer requirements and proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare substrates according to resilient sheet flooring manufacturer's written instructions immediately before installation, sweep and vacuum clean substrates to be covered by resilient sheet flooring.

3.3 RESILIENT SHEET FLOORING INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient sheet flooring onto metal substrate.

B. Scribe and cut resilient sheet flooring to butt neatly and tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, and door frames.

C. Extend resilient sheet flooring into toe spaces, door reveals, closets, and similar openings.

3.4 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protecting resilient sheet flooring.

B. Perform the following operations immediately after completing resilient sheet flooring installation:

1. Remove adhesive and other blemishes from surfaces.

2. Sweep and vacuum surfaces thoroughly.

3. Damp-mop surfaces to remove marks and soil.

C. Protect resilient sheet flooring from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. Cover resilient sheet flooring until Substantial Completion.

END OF SECTION 096516

DESIGNED: CV CADD: PS TECH. REVIEW: DATE: 05/14/2013	SUB SHEET NO. A5	TITLE OF SHEET SPECIFICATIONS FREDERICKSBURG AND SPOTSYLVANIA NATIONAL MILITARY PARK, VIRGINIA	DRAWING NO. PMIS/PKG NO. 143495 SHEET 7 OF 12

SECTION 099113 - PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes surface preparation and the application of paint systems on the following substrates:

1. Steel bollards and pipe rails.
2. Gypsum board.
3. MDO plywood wall panels.

1.2 SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

B. Samples: For each type of paint system and each color and gloss of topcoat.

PART 2 - PRODUCTS

2.1 PAINT, GENERAL

A. MPI Standards: Provide products that comply with MPI standards indicated and that are listed in its "MPI Approved Products List."

B. Material Compatibility:
1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

C. Colors: As selected by Contracting Officer from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Wood: 15 percent.
2. Gypsum Board: 12 percent.

C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

D. Proceed with coating application only after unsatisfactory conditions have been corrected.
1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates and paint systems indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Manual."

B. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.4 CLEANING AND PROTECTION

A. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

B. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.5 PAINTING SCHEDULE

A. Exterior Steel Substrates - Bollards
1. Pigmented Polyurethane over Inorganic Zinc-Rich Primer System:
a. Prime Coat: Primer, zinc-rich, inorganic, MPI #19.
b. Intermediate Coat: As recommended in writing by topcoat manufacturer.
c. Topcoat: Polyurethane, two-component, pigmented, gloss, MPI #72.

B. Exterior Galvanized Steel Substrates - Pipe Railings:
1. Water-Based Light Industrial Coating System:

Prime Coat: Primer, galvanized metal, as recommended in writing by topcoat manufacturer for exterior use on galvanized-metal substrates with topcoat indicated.

d. Intermediate Coat: Light industrial coating, exterior, water based, matching topcoat.

Topcoat: Light industrial coating, exterior, water based, gloss, MPI #164.

C. Exterior Wood Substrates: Including wood-based panel products.
1. Latex System:
a. Prime Coat: Primer, latex for exterior wood, MPI #6.
b. Intermediate Coat: Latex, exterior, matching topcoat.
c. Topcoat: Latex, exterior, low sheen, MPI #15.

D. Gypsum Board Substrates:

1. Water-Based Light Industrial Coating System:
a. Prime Coat: Primer sealer, latex, interior, MPI #50.
b. Intermediate Coat: Light industrial coating, interior, water based, matching topcoat.
c. Topcoat: Light industrial coating, interior, water based, eggshell, MPI #151.

END OF SECTION 099113

SECTION 114000 - PREFABRICATED STORAGE ENCLOSURE

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes manufacturer's standard modular, prefabricated enclosure.

B. Related Sections:

1. Section 096516 “Slip-Resistant Resilient Sheet Flooring.”

1.2 SUBMITTALS

A. Product Data: For each type of product indicated. Include the following:

1. Manufacturer's model number.
2. Accessories and components that will be included for Project.
3. Utility service connections for water, drainage, power, and fuel; include roughing-in dimensions.

B. Samples for Verification: For each interior and exterior factory-applied color finish required.

C. Coordination Drawings: Indicate connections to utilities. Include plans, elevations and utility service characteristics.

D. Operation and Maintenance Data: Emergency, operation, and maintenance information, including the following:

1. Manufacturer's name and model number.
2. List of factory-authorized service agencies including addresses and telephone numbers.

1.3 QUALITY ASSURANCE

A. NSF Standards: Provide equipment that bears NSF Certification Mark or UL Classification Mark certifying compliance with applicable NSF standards.

B. UL Certification: Provide electric and fuel-burning equipment and components that are evaluated by UL for fire, electric shock, and casualty hazards according to applicable safety standards, and that are UL certified for compliance and labeled for intended use.

C. Regulatory Requirements: Install equipment to comply with the following:

1. ASHRAE 15, "Safety Code for Mechanical Refrigeration."
2. NFPA 54, "National Fuel Gas Code."
3. NFPA 70, "National Electrical Code."

D. Preinstallation Conference: Conduct conference at Project site.

1.4 PROJECT CONDITIONS

A. Field Measurements: Verify actual dimensions of construction contiguous with modular prefabricated storage enclosure equipment by field measurements before fabrication. Indicate measurements on Coordination Drawings.

1.5 COORDINATION

A. Coordinate modular prefabricated storage enclosure equipment layout and installation with other work, including layout and installation of lighting fixtures.

B. Coordinate locations and requirements of utility service connections.

PART 2 - PRODUCTS

2.1 MODULAR PREFABRICATED STORAGE ENCLOSURE EQUIPMENT

A. Wall and Ceiling Panels: Bi-level ceiling with interlocking, 4-inch thick insulating panels with embossed galvalume finish (26 ga.).

B. Floor:

1. Storage Enclosure Manufacturer's Floor Panels: 5/8-inch plywood on rigid plastic foam insulation with galvanized metal top and bottom sheet.
2. Finish Floor: Slip-resistant sheet flooring specified in Section 096516, not included as part of storage enclosure finishes.

C. Doors: Double-swing entrance door, 72 by 84 inches, flush mounted, 4-inch thick insulation, constructed of same metal interior and exterior as enclosure.

1. Hinges: Heavy-duty, cam-lift, self-closing and spring loaded; two per door.
a. Provide stainless steel pins and nylon bearings.
2. Latch: Edge-mounted, positive-type latch with cylinder lock and provision for padlock.
3. Include safety-release handle that opens door from inside when door is locked.

D. Accessories:

1. Conduit to top of panel.
2. Fluorescent lights, 2-tube, 48 inches long with bulbs. Quantity as indicated.
3. J-box and conduit.
4. Standard light switch mounted on exterior of enclosure.

2.2 MISCELLANEOUS MATERIALS

A. Installation Accessories, General: NSF certified for end-use application indicated.

B. Elastomeric Joint Sealant: ASTM C 920; silicone. Type S (single component), Grade NS (nonsag), Class 25, Use NT (nontraffic) related to exposure, and Use M, G, A, or O as applicable to joint substrates indicated.

1. Cylindrical Sealant Backing: ASTM C 1330, Type C, closed-cell polyethylene, in diameter greater than joint width.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install equipment level and plumb, according to manufacturer's written instructions.

1. Connect equipment to utilities.

B. Complete equipment assembly where field assembly is required.

C. Install equipment with access and maintenance clearances that comply with manufacturer's written installation instructions and with requirements of authorities having jurisdiction.

D. Install closure-trim strips and similar items requiring fasteners in a bed of sealant.

E. Install joint sealant in joints between equipment and abutting surfaces with continuous joint backing unless otherwise indicated. Produce airtight, watertight, vermin-proof, sanitary joints.

3.2 CLEANING AND PROTECTING

A. After completing installation of equipment, repair damaged finishes.

B. Clean and adjust equipment as required to produce ready-for-use condition.

C. Protect equipment from damage during remainder of the construction period.

END OF SECTION 114000

DESIGNED: CV CADD PS TECH. REVIEW: DATE: 05/14/2013	SUB SHEET NO. A6	TITLE OF SHEET SPECIFICATIONS FREDERICKSBURG AND SPOTSYLVANIA NATIONAL MILITARY PARK, VIRGINIA	DRAWING NO. PMIS/PKG NO. 143495 SHEET 8 OF 12

WP HS — HORN STROBE - WEATHERPROOF
HS — HORN STROBE
B — BELL
S — SMOKE DETECTOR - ZONE#
MM — MONITOR MODULE
A — ABORT SWITCH
MR — MANUAL RELEASE STATION
MS — MAINTENANCE SWITCH
LP — LOW PRESSURE SWITCH
IVO — IVO TAMC INDICATOR
CM — CONTROL MODULE
R — RELAY

3 FIREALARM

WALL MOUNTED LIGHTING FIXTURE

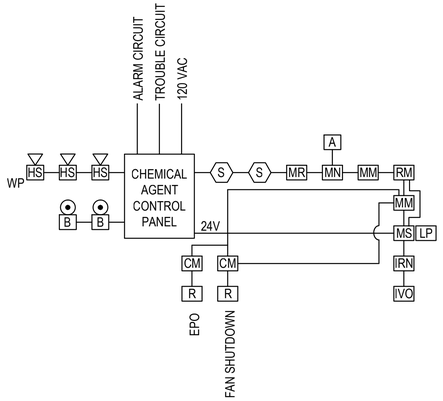
SWITCH - SINGLE POLE - WALL MTD.
SWITCH SUBSCRIPTS:
LOWER CASE a,b,c,etc. INDICATES FIXTURE CONTROL
3 - THREE WAY SWITCH
D - DIMMER SWITCH
M - MOTOR RATED TOGGLE SWITCH
P - PILOT LIGHT
WP - WEATHERPROOF COVER

2 LIGHTING

DUPLEX RECEPTACLE, WALL MTD
GFI — DUPLEX RECEPTACLE, WALL MTD WITH GROUND FAULT CIRCUIT INTERRUPTER
DOUBLE DUPLEX RECEPTACLE, WALL MTD
SPECIAL PURPOSE RECEPTACLE, CONFIGURATION TO MATCH EQUIPMENT: WALL, CEILING
WALL MTD ABOVE COUNTERTOP
J — JUNCTION BOX
30/3 UNF — DISCONNECT SWITCH; AMP/No. OF POLES/UNFUSED
30/3 10 — FUSED DISCONNECT SWITCH; AMP/No. OF POLES/ FUSE AMP.
MOTOR STARTER
COMBINATION MOTOR STARTER
MOTOR
$M — MOTOR RATED SWITCH
HOMERUN 1CKT.
HOMERUN 2CKT.
HOMERUN 3CKT.
RACEWAY
CIRCUITING BREAK LINE
CIRCUITING BREAK LINE
CIRCUIT CONTINUED OR CONNECTED TO EQUIPMENT INDICATED

1 POWER

4 / E1 ELECTRICAL LEGEND



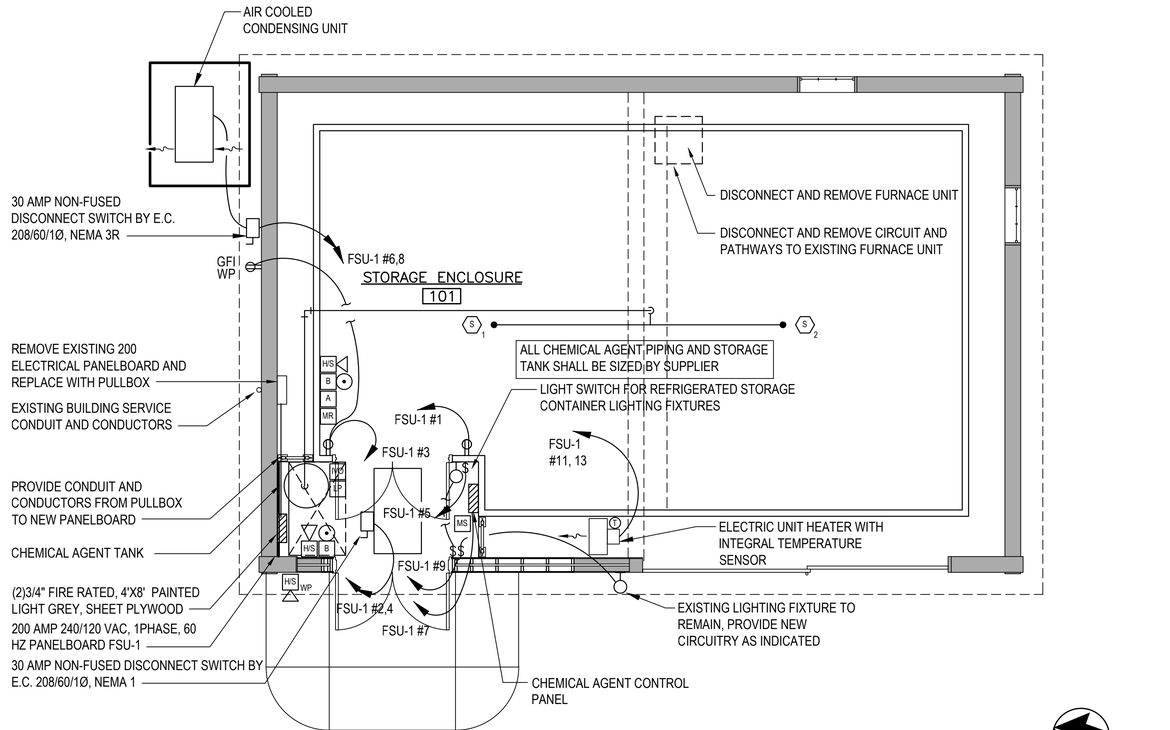
3 / E1 FIRE ALARM DIAGRAM

PANEL: FSU-1
LOCATION: STORAGE BUILDING
MOUNTING: SURFACE, NEMA 3R
VOLTS, PHASE, WIRE: 120/208V, 1Ø, 3W
MAINS: 200A MCB
SHORT CIRCUIT RATING: 22 KAIC

CKT	LOAD DESCRIPTION	CONN LOAD	WIRE SIZE	CB AMPS/ POLE	PHASE	CB AMPS/ POLE	WIRE SIZE	CONN LOAD	LOAD DESCRIPTION	CKT
1	STORAGE UNIT RECPTS	200	12	20/1	A	20/2	12	1200	HVAC EVAPORATOR	2
3	STORAGE UNIT RECPTS	200	12	20/1	B	↓	↓		↓	4
5	STORAGE UNIT LIGHTING	1200	12	20/1	A	20/2	12	1320	AIR COOLED CONDENSING UNIT	6
7	CHEMICAL AGENT CNTL PANEL	800	12	20/1	B	↓	↓	1320	↓	8
9	BUILDING LIGHTING	500	12	20/1	A	20/1				10
11	UNIT HEATER	1500	12	20/2	B	20/1			SPARE	12
13	UNIT HEATER	1500		20/2	A	20/1			SPARE	14
15	SPARE			20/1	B	20/1			SPARE	16
17	SPARE			20/1	A	20/1			SPARE	18
19	SPARE			20/1	B	20/1			SPARE	20
21	SPARE			20/1	A	20/1			SPARE	22
23	SPARE			20/1	B	20/1			SPARE	24
PHASE A CONNECTED (kVA) .					PHASE B CONNECTED (kVA) .				TOTAL CONNECTED .	

NOTE: ALL WIRING SHALL BE INSTALLED IN 3/4" EMT CONDUIT WITH COMPRESSION FITTINGS UNLESS NOTED OTHERWISE
CONTRACTOR SHALL EXTEND ALL PATHWAYS AND CONDUCTOR TO REVISED PANEL LOCATION
CONTRACTOR SHALL REMOVE ALL RECEPTACLE AND DEVICE IN CONFLICT WITH REVISED ARCHITECTURAL LAYOUT, REMOVE CONDUCTORS BACK TO PANELBOARD, PROVIDE DEVICES COVERS.

2 / E1 PANELBOARD SCHEDULE



1 / E1 ELECTRICAL FLOOR PLAN
SCALE (A)

SCALE (A) 4 0 4 8
SCALE OF FEET

DESIGNED: CMS DRAWN: CMS TECH. REVIEW: DATE: 05/14/2013	SUB SHEET NO. E1	TITLE OF SHEET: ELECTRICAL PLAN, LEGEND AND SCHEDULES FREDERICKSBURG AND SPOTSYLVANIA NATIONAL MILITARY PARK, VIRGINIA	DRAWING NO. — PMIS/PKG NO. 143495 SHEET 11 OF 12

DIVISION 26 - ELECTRICAL

SECTION 26000 - BASIC ELECTRICAL REQUIREMENTS

THE FOLLOWING IS A GENERAL LISTING OF WORK ITEMS TO BE PROVIDED UNDER THIS CONTRACT WHICH IS NOT NECESSARILY ALL INCLUSIVE, NOR SHALL IT LIMIT THE EXTENT OF WORK OR EXCLUDE ANY WORK SHOWN OR SPECIFIED AND NOT LISTED:

1. MODIFICATIONS BRANCH CIRCUIT PANELBOARDS AND BRANCH CIRCUIT WIRING.

2. LIGHT FIXTURES AND SIRING DEVICES AS SHOWN OR REQUIRED.

3. POWER CIRCUIT WIRING AND DEVICES FOR WIRING OF MOTORS, APPLIANCES AND UTILIZATION EQUIPMENT FURNISHED BY OTHER TRADES.

4. FURNISH WIRING MATERIALS AND LABOR TO MAKE COMPLETE ELECTRICAL INSTALLATION OF EQUIPMENT AND DEVICES FURNISHED BY OTHER CONTRACTORS.

5. TEMPORARY LIGHTING.

6. OPERATIONAL TEST AND CHECK ALL INSTALLED EQUIPMENT.

7. USE THROUGH-PENTRATION FIRESTOP DEVICES, FORMING MATERIALS, AND FILL, VOID OR CAVITY MATERIALS TO FORM THROUGH-PENETRATION FIRESTOPS TO PREVENT THE PASSAGE OF FLAME, AND LIMIT TEMPERATURE RISE OF THE UNEXPOSED SURFACE AS DETAILED IN THE UL FORE RESISTANCE DIRECTORY, INCHCAPE DIRECTORY OF LISTED PRODUCTS, FACTORY MUTUAL APPROVAL GUIDE, OR THE OMEGA POINT LABORATORIES LISTINGS DIRECTORY.

SECTION 26010 -GENERAL ELECTRICAL REQUIREMENTS

1. COMPLY WITH ALL REQUIREMENTS (INCLUDING LATEST AMENDMENTS OR REVISIONS) OF:
   A. NATIONAL ELELCTRCIAL CODE
   B. NEW YORK STATE PREVENTION AND BUILDING CODE
   C. APPLICABLE LOCAL CODES
   D. UNDERWRITERS LABORATORY

2. OBTAIN ALL PERMITS AND PAY ALL FEES REQUIRED TO COMMENCE AND COMPLETE WORK. OBTAIN A CERTIFICATE OF ACCEPTANCE FROM THE NEW YORK STATE BOARD OF FIRE UNDERWRITERS INDICATING ACCEPTANCE OF WORK PERFORMED UNDER THIS CONTRACT AND DELIVER TO ENGINEER

3. IT IS THE INTENT OF THESE DOCUMENTS THAT ALL SYSTEMS BE INSTALLED COMPLETE AND RENDERED OPERATIONAL AT THE COMPLETION OF THE PROJECT. PROVIDE ALL APPURTENANT MATERIALS OR SERVICES REQUIRED TO SATISFY THIS INTENT.

4. LAYOUTS OF EQUIPMENT, ACCESSORIES AND PIPING SYSTEMS ON PLANS ARE GENERALLY DIAGRAMMATIC UNLESS SPECIFICALLY DIMENSIONED OR DETAILED. CHECK PROJECT DRAWINGS AND DETAILS PRIOR TO INSTALLING WORK FOR INTERFERENCES AS GOVERNED BY STRUCTURAL OR OTHER CONDITIONS. OWNER RESERVES THE RIGHT TO MAKE REASONABLE CHANGES IN LOCATION OF EQUIPMENT AND ACCESSORIES PRIOR TO ROUGHING-IN WITHOUT ADDITIONAL EXPENSES.

5. EACH CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH STRUCTURAL DETAILS AND WORK OF OTHER TRADES. PERFORM AND COORDINATE WORK SO AS TO MAINTAIN SCHEDULES AND AVOID INTERFERENCES WITH OTHERS.

6. ALL MATERIALS SHALL BE NEW AND BEAR THE U.L. LABEL.

SECTION 260519 -LOW VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES.

1.1 SUMMARY
   A. SECTION INCLUDES:
      1. BUILDING WIRES AND CABLES RATED 600v AND LESS.
      2. CONNECTORS, SPLICES AND TERMINATIONS RATED 600V AND LESS.

1.2 ACTION SUBMITTALS
   A. PRODUCT DATA: FOR EACH TYPE OF PRODUCT.

1.3 INFORMATIONAL SUBMITTALS
   A. FIELD QUALITY CONTROL REPORTS

PART 2 - PRODUCTS

2.1 CONDUCTORS AND CABLES
   A. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
      1. ALPHA WIRE
      2. BELDEN INC.
      3. ENCORE WIRE CORPORATION
      4. GENERAL CABLE TECHNOLOGIES CORPORATION
      5. SOUTHWIRE INCORPORATED

   B. COPPER CONDUCTORS: COMPLY WITH NEMA WC 70/ICEA S-95-658

   C. CONDUCTOR INSULATION: COMPLY WITH NEMA WC 70/ICEA S-95-658. FOR TYPE THHN-2-THWN-2.

2.2 CONNECTORS AND SPLICES

   A. MANUFACTURER: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
      1. AFC CABLE SYSTEMS, INC.
      2. GARDNER BENDER
      3. HUBBELL POWER SYSTEMS, INC.
      4. IDEAL INDUSTRIES, INC
      5. LLSCO; A BRANCH OF BARDES CORPORATION
      6. NSI INDUSTRIES LLC
      7. O-Z/GEDNEY; A BRANDS OF THE EGS ELECTRICAL GROUP
      8. 3M; ELECTRICAL MARKETS DIVISION
      9. TYCO ELECTRONICS

   B. DESCRIPTION: FACTORY- FABRICATED CONNECTORS AND SPLICES OF SIZE, AMPACITY RATING, MATERIAL, TYPE, AND CLASS FOR APPLICATION AND SERVICE INDICATED.

2.3 SYSTEM DESCRIPTION

   A. ELECTRICAL COMPONENTS, DEVICES AND ACCESSORIES: LISTED AND LABELED AS DEFINES IN NFPA 70, BY A QUALIFIED TESTING AGENCY AND MARKED FOR INTENDED LOCATION AND APPLICATION.

   B. COMPLY WITH NFPA 70.

PART 3 - EXECUTION

3.1. CONDUCTOR MATERIAL APPLICATIONS

   A. BRANCH CIRCUITS: COPPER. SOLID FOR NO.10 AWG AND SMALLER; STRANDED FOR NO.8 AWG AND LARGER.

3.2 CONDUCTOR INSULATION AND MULTI-CONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

   A. EXPOSED BRANCH CIRCUITS: TYPE THHN-2-THWN-2, SINGLE CONDUCTORS IN RACEWAY
   B. BRANCH CIRCUITS CONCEALED IN CEILINGS, WALLS AND PARTITIONS: TYPE THHN-2 - THWN-2 SINGLE CONDUCTORS IN RACEWAYS

3.3 INSTALLATION OF CONDUCTORS AND CABLES

   A. CONCEAL CABLES IN FINISHED WALLS, CEILINGS, AND FLOORS UNLESS OTHERWISE INDICATED.

   B. COMPLETE RACEWAY INSTALLATION BETWEEN CONDUCTOR AND CABLE TERMINATION POINTS ACCORDING TO SECTION 260533 "RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS" PRIOR TO PULLING CONDUCTORS AND CABLES.

   C. USE MANUFACTURER-APPROVED PULLING COMPOUND OR LUBRICANT WHERE NECESSARY; COMPOUND USED MUST NOT DETERIORATE CONDUCTOR OR INSULATION. DO NOT EXCEED MANUFACTURER'S RECOMMENDED MAXIMUM PULLING TENSIONS AND SIDEWALL PRESSURE VALUES.

   D. USE PULLING MEANS, INCLUDING FISH TAPE, CABLE, ROPE AND BASKET-WEAVE WIRE/CABLE GRIPS, THAT WILL NOT DAMAGE CABLES OR RACEWAY.

   E. INSTALL EXPOSED CABLES PARALLEL AND PERPENDICULAR TO SURFACES TO EXPOSED STRUCTURAL MEMBERS, AND FOLLOW SURFACE CONTOURS WHERE POSSIBLE.

   2. ITW RAMSET/RED HEAD; A DIVISION OF ILLINOIS TOOL WORKS, INC.
   3. MKT FASTENING, LLC
   4. COOPER B-LINE, INC.; A DIVISION OF COOPER INDUSTRIES

   2. CLAMPS FOR ATTACHMENT TO STEEL STRUCTURAL ELEMENTS: MSS SP-58, TYPE SUITABLE FOR ATTACHED STRUCTURAL ELEMENT.
   3. THROUGH BOLTS: STRUCTURAL TYPE, HEX HEAD AND HIGH STRENGTH. COMPLY WITH ASTM A 325.
   4. TOGGLE BOLTS: ALL STEEL SPRINGHEAD TYPE
   5. HANGER RODS: THREADED STEEL.

2.2 FABRICATED METAL EQUIPMENT SUPPORTS ASSEMBLIES

   A. DESCRIPTION: WELDED OR BOLTED, STRUCTURAL-STEEL SHAPES, SHOP OR FIELD FABRICATED TO FIT DIMENSIONS OF SUPPORTED EQUIPMENT.

PART 3 - EXECUTION

3.1 APPLICATION

   A. COMPLY WITH NECA 1 AND NECA 101 FOR APPLICATION OF HANGERS AND SUPPORTS FOR ELECTRICAL EQUIPMENT AND SYSTEM EXCEPT IF REQUIREMENT IN THIS SECTION ARE STRICTER.
   B. MAXIMUM SUPPORT SPACING AND MINIMUM ROD SIZE FOR RACEWAY: SPACE SUPPORTS FOR EMT, IMC, AND RMC AS SCHEDULED IN NECA 1, WHERE ITS TABLE MAXIMUM SPACING LESS THAN STATED IN NFPA 70. MINIMUM ROD SIZE SHALL BE ¼ INCH (6 MM) IN DIAMETER,.
   C. MULTIPLE RACEWAYS OR CABLES: INSTALL TRAPEZE-TYPE SUPPORTS FABRICATED WITH STEEL SLOTTED SUPPORT SYSTEM, SIZED SO CAPACITY CAN BE INCREASED BY AT LEAST 25 PERCENT IN FUTURE WITHOUT EXCEEDING SPECIFIED DESIGN LOAD LIMITS.
      1. SECURE RACEWAYS AND CABLES TO THESE SUPPORTS WITH SINGLE BOLT CONDUIT USING SPRING FRICTION ACTION FOR RETENTION IN SUPPORT CHANNEL.
   D. SPRING-STEEL CLAMPS DESIGNED FOR SUPPORTING SINGLE CONDUITS WITHOUT BOLTS MAY BE USED FOR 1-1.2 INCH (38 MM) AND SMALLER RACEWAYS SERVING BRANCH CIRCUITS AND COMMUNICATION SYSTEMS ABOVE SUSPENDED CEILING FOR FASTENING RACEWAYS TO TRAPEZE SUPPORTS.

3.2 SUPPORT INSTALLATION

   A. COMPLY WITH NECA 1 AND NECA 101 FOR INSTALLATION REQUIREMENTS EXCEPT AS SPECIFIED IN THIS ARTICLE.
   B. RACEWAY SUPPORT METHODS: IN ADDITION TO METHODS DESCRIBED IN EMT, IMC, RMC MAY BE SUPPORTED BY OPENINGS THROUGH STRUCTURE MEMBERS, AS PERMITTED IN NFPA 70.
   C. STRENGTH OF SUPPORT ASSEMBLIES: WHERE NOT INDICATED, SELECT SIZES OF COMPONENTS SO STRENGTH WILL BE ADEQUATE TO CARRY PRESENT AND FUTURE STATIC LOADS WITHIN SPECIFIED LOADING LIMITS. MINIMUM STATIC DESIGN LOAD USED FOR DETERMINATION SHALL BE WEIGHT OF SUPPORTED COMPONENTS PLUS 200 LB (90KG).
   D. MOUNTING AND ANCHORAGE OF SURFACE-MOUNTED EQUIPMENT AND COMPONENTS: ANCHOR AND FASTEN ELECTRICAL ITEMS AND THEIR SUPPORTS TO BUILDING STRUCTURAL ELEMENTS BY THE FOLLOWING METHODS UNLESS OTHERWISE INDICATED BY CODE:
      1. TO EXISTING CONCRETE: EXPANSION ANCHORS FASTENERS.
      2. TO STEEL: BEAM CLAMPS (MSS TYPE 19,21,23,25, OR 27) COMPLYING WITH MSS SP-69
      3. ITEMS MOUNTED ON HOLLOW WALLS AND NONSTRUCTURAL BUILDING SURFACES: MOUNT CABINETS, PANELBOARDS, DISCONNECT SWITCHES, CONTROL ENCLOSURES, PULL AND JUNCTION BOXES, TRANSFORMERS, AND OTHER DEVICES ON SLOTTED=CHANNEL RACKS ATTACHED TO SUBSTRATE.
   E. DRILL HOLES FOR EXPANSION ANCHORS IN CONCRETE AT LOCATIONS AND DEPTHS THAT AVOID REINFORCING BARS.

3.3 PAINTING

   A. TOUCHUP: CLEAN FIELD WELDS AND ABRADED AREAS OF SHOP PAINT. PAINT EXPOSED AREAS IMMEDIATELY AFTER ERECTING HANGERS AND SUPPORTS. USE SAME MATERIALS AS SUED FOR SHOP PAINTING. COMPLY WITH SSPC-PA1 REQUIREMENTS OR TOUCHING UP FIELD-PAINTED SURFACES.
      1. APPLY PAINT BY BRUSH OR SPRAY TO PROVIDE MINIMUM DRY FILM THICKNESS OF 2.0 MILS (0.05 MM).
   B. GALVANIZED SURFACES: CLEAN WELDS, BOLTED CONNECTIONS, AND ABRADED AREAS AND APPLY GALVANIZED-REPAIR PAINT TO COMPLY WITH ASTM A 780.

F. SUPPORT CABLES ACCORDING TO SECTION 260529 "HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS."

3.4 CONNECTIONS

   A. TIGHTEN ELECTRICAL CONNECTORS AND TERMINALS ACCORDING TO MANUFACTURER'S PUBLISHED TORQUE-TIGHTENING VALUES. IF MANUFACTURER'S TORQUE VALUES ARE NOT INDICATED, USE THOSE SPECIFIED IN UL 486A-486B.

   B. MAKE SPLICES, TERMINATIONS, AND TAPS THAT ARE COMPATIBLE WITH CONDUCTOR MATERIAL AND THAT POSSESS EQUIVALENT OR BETTER MECHANICAL STRENGTH AND INSULATION RATINGS THAT UNSPLICES CONDUCTORS.

3.5 IDENTIFICATION

   A. IDENTIFY AND COLOR-CODE CONDUCTORS AND CABLES ACCORDING TO SECTION 260553 "IDENTIFICATION FOR ELECTRICAL SYSTEMS."

   B. IDENTIFY EACH SPARE CONDUCTOR AT EACH END WITH IDENTITY NUMBER AND LOCATION OR OTHER END OF CONDUCTOR, AND IDENTIFY AS SPARE CONDUCTOR.

3.6 FIRESTOPPING

   A. APPLY FIRESTOPPING TO ELECTRICAL PENETRATIONS OF FIRE-RATED FLOOR AND WALL ASSEMBLIES TO RESTORE ORIGINAL FIRE-RESISTANCE RATING OF ASSEMBLY ACCORDING TO SECTION SECTION 078413 "PENETRATIONS FIRESTOPPING."

3.7 FIELD QUALITY CONTROL

   A. PERFORM THE FOLLOWING TESTS AND INSPECTIONS

      1. PERFORM EACH VISUAL AND MECHANICAL INSPECTION AND ELECTRICAL TEST STATED IN NETA ACCEPTANCE TESTING SPECIFICATION. CERTIFY COMPLIANCE WITH TEST PARAMETERS.

   B. TEST AND INSPECTION REPORTS: PREPARE A WRITTEN REPORT TO RECORD THE FOLLOWING:

      1. PROCEDURES USED.
      2. RESULTS THAT COMPLY WITH REQUIREMENTS.
      3. RESULTS THAT DO NOT COMPLY WITH REQUIREMENTS AND CORRECTIVE ACTION TAKEN TO ACHIEVE COMPLIANCE WITH REQUIREMENTS.

   C. CABLES WILL BE CONSIDERED DEFECTIVE IF THEY DO NOT PASS TESTS AND INSPECTIONS.

SECTION 260529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

   A. THIS SECTION INCLUDES THE FOLLOWING:
      1. HANGERS AND SUPPORTS FOR ELECTRICAL EQUIPMENT AND SYSTEMS.

1.2 DEFINITIONS

   A. EMT: ELECTRICAL METALLIC TUBING

   B. IMC: INTERMEDIATE METAL CONDUIT

   C. RMC: RIGID METAL CONDUIT

1.3 PERFORMANCE REQUIREMENTS

   A. DESIGN SUPPORTS FOR MULTIPLE RACEWAYS CAPABLE OF SUPPORTING COMBINED WEIGHT OF SUPPORTED SYSTEMS AND ITS CONTENTS.

   B. DESIGN EQUIPMENT SUPPORTS CABLE OF SUPPORTING COMBINED OPERATING WEIGHT OF SUPPORTED EQUIPMENT AND CONNECTED SYSTEMS AND COMPONENTS.

1.4 ACTION SUBMITTALS

   A. PRODUCT DATA: FOR THE FOLLOWING:
      1. STEEL SLOTTED SUPPORT SYSTEMS.

   B. SHOP DRAWINGS: SHOW FABRICATION AND INSTALLATION DETAILS AND INCLUDED CALCULATIONS FOR THE FOLLOWING:
      1. TRAPEZE HANGERS. INCLUDE PRODUCT DATA FOR COMPONENTS.
      2. STEEL SLOTTED CHANNEL SYSTEMS. INCLUDE PRODUCT DATA FOR COMPONENTS.
      3. EQUIPMENT SUPPORTS.

1.5 QUALITY ASSURANCES

   A. COMPLY WITH NFPA 70.

PART 2 - PRODUCTS

2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

   A. STEEL SLOTTED SUPPORT SYSTEMS: COMPLY WITH MFMA-4, FACTORY-FABIRAICTED COMPONENTS FOR FIELD ASSEMBLY
      1. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
         A. ALLIED TUBE AND CONDUIT
         B. COOPER B-LINE, INC,; A DIVISION OF COOPER INDUSTRIES
         C. ERICO INTERNATIONAL CORPORATION
         D. THOMAS AND BETTS CORPORATION
         E. UNISTRUT; TYCO INTERNATIONAL, LTD.

      2. METALLIC COATINGS: HOT DIP GALVANIZED AFTER FABRICATION AND APPLIED ACCORDING TO MFMA-4.
      3. CHANNEL DIMENSIONS: SELECTED FOR APPLICABLE LOAD CRITERIA.

   B. RACEWAY AND CABLE SUPPORTS: AS DESCRIBED IN NECA 1 AND NECA 101

   C. CONDUIT AND CABLE SUPPORT DEVICES: STEEL HANGERS, CLAMPS AND ASSOCIATED FITTINGS, DESIGNED FOR TYPES OF SIZES OF RACEWAY OR CABLE TO BE SUPPORTED.

   D. SUPPORTS FOR CONDUCTORS IN VERTICAL CONDUIT: FACTORY-FABIRICATED ASSEMBLY CONSISTING OF THREADED BODY AND INSULATING WEDGE PLUG OR PLUGS FOR NON-ARMORED ELECTRICAL OR CABLES IN RISER CONDUITS. PLUGS SHALL HAVE NUMBER, SIZE, AND SHAPE OF CONDUCTOR GRIPPING PIECES AS REQUIRED TO SUIT INDIVIDUAL CONDUCTORS OR CABLES SUPPORTED. BODY SHALL BE MALLEABLE IRON.

   E. STRUCTURAL STEEL FOR FABRICATED SUPPORTS AND RESTRAINTS: ASTM A 36/A 36M, STEEL PLATES, SHAPES, AND BARS; BLACK AND GALVANIZED.

   F. MOUNTING, ANCHORING AND ATTACHMENT COMPONENTS: ITEMS FOR FASTENING ELECTRICAL ITEMS OR THEIR SUPPORTS TO BUILDING SURFACES INCLUDE THE FOLLOWING:
      1. MECHANICAL-EXPANSION ANCHORS: INDERST-WEDGE-TYPE ZINC-COATED STEEL, FOR USE IN HARDENED PORTLAND CEMENT CONCRETE WITH TENSION, SHEAR, AND PULLOUT CAPACITIES APPROPRIATE FOR SUPPORTED LOADS AND BUILDING MATERIALS IN WHICH USED.
         A. MANUFACTURER: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
            1. HILTI INC.

SECTION 260533 - RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

   A. THIS SECTION INCLUDES THE FOLLOWING:
      1. METAL CONDUIT, TUBING AND FITTINGS
      2. BOXES, ENCLOSURES AND CABINETS.

1.2 DEFINITIONS

   A. GRC: GALVANIZED RIGID STEEL CONDUIT

   B. IMC: INTERMEDIATE METAL CONDUIT

1.3 ACTION SUBMITTALS

   A. PRODUCT DATA: FOR WIREWAYS AND FITTINGS

1.4 INFORMATIONAL SUBMITTALS

   A. COORDINATION DRAWINGS: CONDUIT ROUTING PLANS, DRAWN TO SCALE, ON WHICH THE FOLLOWING ITEMS ARE SHOWN AND COORDINATED WITH EACH OTHER, USING INPUT FROM INSTALLERS OF ITEMS INVOLVED:
      1. STRUCTURAL MEMBERS IN PATHS OF CONDUIT GROUPS WITH COMMON SUPPORTS.
      2. HVAC AND PLUMBING ITEMS AND ARCHITECTURAL FEATURES IN PATHS OF CONDUIT GROUPS WITH COMMON SUPPORTS.

   B. SOURCE QUALITY - CONTROL REPORTS

PART 2 - PRODUCTS

2.1 METAL CONDUITS, TUBING AND FITTINGS

   A. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
      1. AFC CABLE SYSTEMS, INC.
      2. ALLIED TUBE AND CONDUIT
      3. O-Z/GEDNEY
      4. THOMAS AND BETTS CORPORATION
      5. WESTERN TUBE AND CONDUIT
      6. WHEATLAND TUBE COMPANY

   B. LISTING AND LABELING: METAL CONDUITS, TUBING AND FITTINGS SHALL BE LISTED AND LABELED AS DEFINED IN NFPA 70, BY A QUALIFIED TESTING AGENCY AND MARKED FOR INTENDED LOCATION AND APPLICATION.

   C. GRC: COMPLY WITH ANSI C80.1 UL 6

   D. EMT: COMPLY WITH ANSI C80.3 AND UL 797

   E. FMC: COMPLY WITH UL1; ZINC-COATED STEEL

   F. FITTINGS FOR METAL CONDUIT: COMPLY WITH NEMA FB 1 AND UL 514B
      1. FITTINGS FOR EMT:
         A. MATERIAL: STEEL
         B: TYPE: COMPRESSION

2.2 BOXES, ENCLOSURES AND CABINETS
   A. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
      1. COOPER TECHNOLOGIES COMPANY; COPPER CROUSE HINDS
      2. EGS/APPLETON ELECTRIC
      3. HOFFMAN
      4. O-Z/GEDNEY
      5. RACO; HUBBELL

      B. SHEET METAL OUTLET AND DEVICE BOXES: COMPLY WITH NEMA OS 1 AND UL 514A.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION
   A. INDOOR: APPLY RACEWAY PRODUCTS AS SPECIFIED BELOW UNLESS OTHERWISE INDICATED:
      1. EXPOSED: EMT
      2. CONCEALED IN CELINGS AND INTERIOR WALLS AND PARTITIONS: EMT

   B. MINIMUM RACEWAY SIZE: 3/4 INCH (21 MM) TRADE SIZE

   C. RACEWAY FITTINGS: COMPATIBLE WITH RACEWAYS AND SUITABLE FOR USE AND LOCATION.
      1. EMT: USE COMPRESSION, STEEL FITTINGS. COMPLY WITH NEMA FB 2.10
      2. FLEXIBLE CONDUIT: USE ONLY FITTINGS LISTED FOR USE WITH FLEXIBLE CONDUIT. COMPLY WITH NEMA FB 2.20

3.2 INSTALLATION
   A. COMPLY WITH NECA 1 AND NECA 101 FOR INSTALLATION REQUIREMENTS ON DRAWINGS OR IN THIS ARTICLE ARE STRICTER.

   B. INSTALL NO MORE THAN THE EQUIVALENT OF THREE 90-DEGREE BENDS IN ANY CONDUIT RUN EXCEPT FOR CONTROL WIRING CONDUITS FOR WHICH FEWER BENDS ARE ALLOWED. SUPPORT WITHIN 12 INCHES (300 MM) OF CHANGES IN DIRECTION.

   C. FLEXIBLE CONDUIT CONNECTIONS: COMPLY WITH NEMA RV 3. USE A MAXIMUM OF 36 INCHES (915 MM) OF FLEXIBLE CONDUIT FOR LUMINAIRES.

3.3 FIRESTOPPING

   A. INSTALL FIRESTOPPING AT PENETRATIONS OF FIRE RATED FLOOR AND WALL ASSEMBLIES. COMPLY WITH REQUIREMENTS IN SECTION 078413 "PENETRATION FIRESTOPPING"

SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY
   A. SECTION INCLUDES:
      1. IDENTIFICATION FOR RACEWAYS
      2. IDENTIFICATION OF POWER AND CONTROL CABLES
      3. IDENTIFICATION OF CONDUCTORS
      4. EQUIPMENT IDENTIFICATION LABELS
      5. MISCELLANEOUS IDENTIFICATION PRODUCTS

1.2 ACTION SUBMITTALS
   A. PRODUCT DATA: FOR EACH ELECTRICAL IDENTIFICATION PRODUCT INDICATED.

   B. SAMPLES: FOR EACH TYPE OF LABEL AND SIGN TO ILLUSTRATE SIZE, COLORS, LETTERING STYLE, MOUNTING PROVISIONS, AND GRAPHIC FEATURES OF IDENTIFICATION PRODUCTS.

   C. IDENTIFICATION SCHEDULE: AN INDEX OF NOMENCLATURE OF ELECTRICAL EQUIPMENT AND SYSTEM COMPONENTSUSED IN IDENTIFICATION SIGNS AND LABELS.

1.3 QUALITY ASSURANCE
   A. COMPLY WITH ANSI A13.1

   B. COMPLY WITH NFPA 70

   C. COMPLY WITH 29 CFR 1910.144 AND 29 CFR 1910.145

   D. COMPLY WITH ANSI Z535.4 FOR SAFETY SIGNS AND LABELS

   E. ADHESIVE ATTACHED LABELING MATERIALS, INCLUDING LABEL STOCK, LAMINATING ADHESIVES AND INKS USED BY LABEL PRINTERS, SHALL COMPLY WITH UL 969.

1.4 COORDINATION
   A. COORDINATE IDENTIFICATION NAMES, ABBREVIATIONS, COLORS, AND OTHER FEATURES WITH REQUIREMENTS IN OTHER SECTIONS REQUIRING IDENTIFICATION APPLICATIONS, DRAWING, SHOP DRAWINGS, MANUFACTURER'S WIRING DIAGRAMS AND THE OPERATIONS AND MAINTENANCE MANUAL; AND THOSE REQUIRED BY CODES, STANDARDS AND 29 CFR 1910.145. USE CONSISTENT DESIGNATION THROUGHOUT PROJECT.

PART 2 - PRODUCTS

2.1 POWER AND CONTROL RACEWAY IDENTIFICATION MATERIALS

   A. COMPLY WITH ANSI A13.1 FOR MINIMUM SIZE OF LETTERS FOR LEGEND AND FOR MINIMUM LENGTH OF COLOR FIELD FOR EACH RACEWAY SIZE.

   B. SNAP-AROUND LABELS FOR RACEWAYS CARRYING CIRCUITS AT 600 V OR LESS: SLIT, PRETENSIONED, FLEXIBLE, SOLID-COLORED ACRYLIC SLEEVE, 2 INCHES (50MM) LONG, WITH DIAMETER SIZE TO SUIT DIAMETER OF RACEWAY OR CABLE IT IDENTIFIES AND TO STAY IN PLACE BY GRIPPING ACTION.

   C. WRITE-ON TAGS: POLYESTER TAG, 0.015 INCH (0.38 MM) THICK, WITH CORROSION RESISTANT GROMMET AND CABLE TIE FOR ATTACHMENTS TO CONDUCTOR OR CABLE.
      1. MARKER FOR TAGS: MACHINE-PRINTED, PERMANENT, WATERPROOF, BLACK INK MAKER RECOMMENDED BY PRINTER MANUFACTURER.

PART 3 - EXECUTION

3.1 INSTALLATION

   A. VERIFY IDENTIFY OF EACH ITEM BEFORE INSTALLATION IDENTIFICATION PRODUCTS

   B. LOCATION: INSTALL IDENTIFICATION MATERIALS AND DEVICES

   C. APPLY IDENTIFICATION DEVICES TO SURFACES THAT REQUIRE FINISH AFTER COMPLETING FINISH WORK.

   D. SELF-ADHESIVE IDENTIFICATION PRODUCTS: CLEAN SURFACES: CLEAN SURFACES BEFORE APPLICATION, USING MATERIALS AND METHODS RECOMMENDED BY MANUFACTURER OF IDENTIFICATION DEVICE.

3.2 IDENTIFICATION SCHEDULE

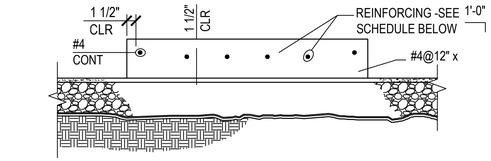
   A. POWER-CIRCUIT CONDUCTOR IDENTIFICATION, 600V OR LESS: FOR CONDUCTORS IN PULL AND JUNCTION BOXES USE COLOR CODING CONDUCTOR TAPE TO IDENTIFY THE PHASE.

      1. COLOR CODING OF PHASE IDENTIFICATION, 600 V OR LESS: USE COLORS LISTED BELOW FOR BRANCH CIRCUIT CONDUCTORS.
         A. COLORS SHALL BE FACTORY APPLIED OR FIELD APPLIED FOR SIZES LARGER THAN NO.8 AWG, IF AUTHORITIES HAVING JURISDICTION PERMIT.

         B. COLORS FOR 208/120-V CIRCUITS:
            1. PHASE A: BLACK
            2. PHASE B: RED
            3. PHASE C: BLUE

         C. AUXILIARY ELECTRICAL SYSTEMS CONDUCTOR IDENTIFICATION: IDENTIFY FIELD-INSTALLED ALARM, CONTROL AND SIGNAL CONNECTIONS.
            1. IDENTIFY CONDUCTORS, CABLES AND TERMINALS IN ENCLOSURES AND AT JUNCTIONS, TERMINALS AND PULL POINTS. IDENTIFY BY SYSTEM AND CIRCUIT DESIGNATION.
            2. USE SYSTEM OF MARKER TAPE DESIGNATIONS THAT IS UNIFORM AND CONSISTENT WITH SYSTEM USED BY MANUFACTURER FOR FACTORY-INSTALLED CONNECTIONS.
            3. COORDINATE IDENTIFICATION WITH PROJECT DRAWINGS, MANUFACTURER'S WIRING DIAGRAMS, AND THE OPERATION ND MAINTENANCE MANUAL

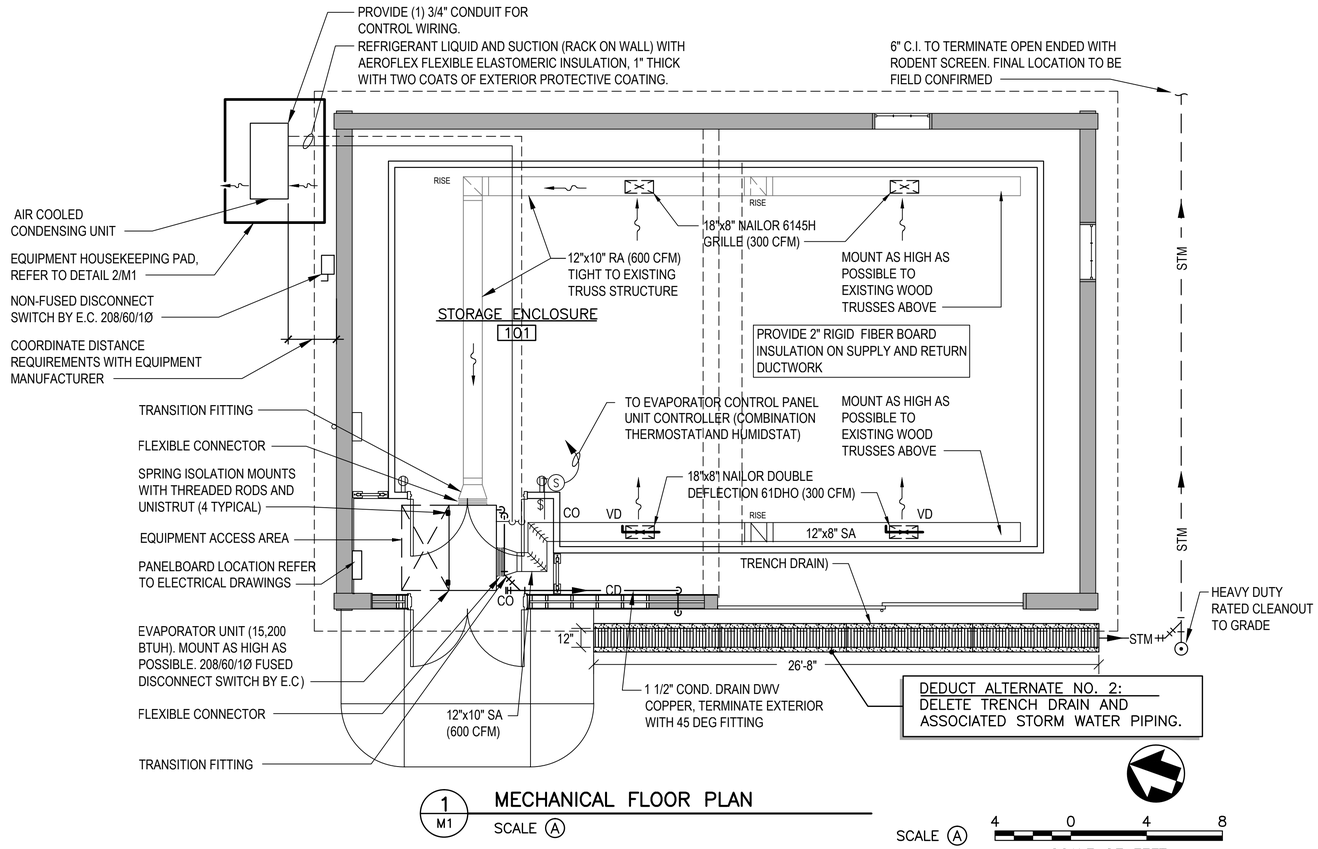
DESIGNED: CMS DRAWN: CMS TECH. REVIEW: DATE: 05/14/2013	SUB SHEET NO. E2	TITLE OF SHEET ELECTRICAL SPECIFICATIONS FREDERICKSBURG AND SPOTSYLVANIA NATIONAL MILITARY PARK, VIRGINIA	DRAWING NO. PMIS/PKG NO. 143495 SHEET 12 OF 12



EQUIPMENT TAG	PAD THICKNESS	REINFORCING	DIMENSIONS
AIR COOLED COND. UNIT	4	#4@12" OC EW	6'-6"L x 5'-4"W

2 / M1 TYPICAL EQUIP. HOUSEKEEPING PAD

NOT TO SCALE



1 / M1 MECHANICAL FLOOR PLAN

SCALE (A)

SCALE (A) 4 0 4 8

SCALE OF FEET

5 FITTINGS

	90 DEGREE ELBOW (SIDE)
	BLIND FLANGE
CO	CLEANOUT WITH PLUG
	ELBOW TURNED DOWN
	ELBOW TURNED UP
	FLANGE
	HOSE END CONNECTION
	PIPE CONTINUES
	RISE OR DROP IN PIPE
	TEE (SIDE)
	TEE TURNED DOWN
	TEE TURNED UP
	UNION

4 CONTROLS

T	THERMOSTAT OR TEMPERATURE SENSOR MOUNT 48" A.F.F. TO TOP UNLESS OTHERWISE NOTED

3 VAVLES

	BALL VALVE

2 PIPING

	FLOW DIRECTION WITHIN PIPE
CD	CONDENSATE DRAIN
CW	COLD WATER
D	DRAIN

1 SHEETMETAL

	SUPPLY DUCT RISER IN PLAN
	RETURN EXHAUST DUCT RISER IN PLAN
10x8	RECTANGULAR DUCTWORK (WIDTH x DEPTH)
10x8 FO	FLAT OVAL DUCTWORK
8 Ø	ROUND DUCTWORK (SIZE, DIAMETER)
	FLEXIBLE DUCTWORK (MAX. OVERALL LENGHT 3'-0")
	SQUARE-THROATED ELBOW W/TURNING VANES
	RADIUS ELBOW
	VOLUME DAMPER
	TRANSITION WITH FLAT SIDE
	TRANSITION ON CENTER
	RECTANGULAR-TO-ROUND TRANSITION
	TAKE-OFF TAP TO RECTANGULAR DUCT AND VOLUME DAMPER
	CONICAL TAP TO RECTANGULAR DUCT AND VOLUME DAMPER
	FLEXIBLE CONNECTOR
	ACCESS DOOR
	SIDE WALL REGISTER/GRILLE
	RETURN GRILLE WITH ACOUSTICALLY LINED BOOT
CD-1, 8 Ø 200 CFM	SUPPLY DIFFUSER WITH TAG (TAG INCLUDES DIFFUSER TYPE, NECK SIZE AND CFM)
ER-1, 8x8 200 CFM	RETURN REGISTER OR EXHAUST REGISTER WITH TAG (TAG INCLUDES REGISTER TYPE, NECK SIZE AND CFM)

3 / M1 MECHANICAL LEGEND

DESIGNED: CMS	SUB SHEET NO.	TITLE OF SHEET	DRAWING NO.
DRAWN: CMS	M1	MECHANICAL PLAN, LEGEND AND SCHEDULES	PMIS/PKG NO. 143495
TECH. REVIEW:		FREDERICKSBURG AND SPOTSYLVANIA NATIONAL MILITARY PARK, VIRGINIA	SHEET 9 OF 12
DATE: 05/14/2013			

DIVISION 23 - MECHANICAL
SECTION 26000 - BASIC ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.1 PLANS AND SPECIFICATIONS

A. ALL WORK UNDER THIS TITLE, ON DRAWING OR SPECIFIED, IS SUBJECT TO THE ARCHITECTURAL GENERAL AND SPECIAL CONTRACT CONDITIONS FOR THE ENTIRE PROJECT, AND THE CONTRACTOR FOR THIS PORTION OF THE WORK IS REQUIRED TO REFER ESPECIALLY THERETO, AND TO THE ARCHITECTURAL DRAWINGS.

B. DRAWINGS AND SPECIFICATIONS ARE COMPLEMENTARY AND MUST BE SO INTERPRETED TO DETERMINE THE FULL SCOPE OF WORK UNDER THIS HEADING. WHATEVER ANY MATERIAL, ARTICLE, OPERATION OR METHODS IS EITHER SPECIFIED OR SHOWN ON THE DRAWINGS, THIS CONTRACTOR IS REQUIRED TO PROVIDE EACH ITEM AND PERFORM EACH OPERATION ACCORDING TO THE DESIGNATE QUALITY, QUALIFICATION OR CONDITION, FURNISHING ALL NECESSARY LABOR, EQUIPMENT OR INCIDENTALS.

1.2 CONFLICTS

A. IF A CONFLICT APPEARS BETWEEN THE DRAWINGS AND THE SPECIFICATIONS, THE CONTRACTOR IS TO CONTACT THE ENGINEER FOR CLARIFICATION.

B. IN THE ABSENCE OF A CLARIFICATION BY THE ENGINEER, THE CONTRACTOR MUST INSTALL HIS WORK IN ACCORDANCE WITH THE MORE STRINGENT APPLICATION.

1.3 DIMENSIONS, LAYOUTS AND OBSTACLES

A. VERIFY DIMENSIONS AND ELEVATIONS FROM GENERAL CONSTRUCTION DRAWINGS OR BY ACTUAL FIELD MEASUREMENTS AFTER BUILDING CONSTRUCTION HAS SUFFICIENTLY PROGRESSED.

B. ASSUME FULL AND FINAL RESPONSIBILITY FOR THE ACCURACY OF ANY OR ALL WORK PERFORMED UNDER THIS DIVISION AND MAKE REPAIRS AND CORRECTIONS AS REQUIRED OR DIRECTED AT NOT EXTRA COST TO THE OWNER.

C. LAYOUT OF PIPING, AND DUCTWORK, AND EQUIPMENT SHOWN ON DRAWINGS ARE DIAGRAMMATIC AND SHALL BE CONSTRUED AS SUCH.

D. MAKE ACTUAL INSTALLATIONS IN ACCORD WITH SAID LAYOUTS, BUT WITH NECESSARY DEVIATIONS AS DIRECTED OR REQUIRED BY JOB CONDITIONS AND FIELD MEASUREMENTS IN ORDER TO PRODUCE A THOROUGHLY INTEGRATED AND PRACTICAL JOB UPON COMPLETING, BUT MAKE DEVIATIONS ONLY WITH SPECIFIC APPROVAL OF THE ENGINEER.

E. TAKE PARTICULAR CARE TO COORDINATE ALL PIPING AND DUCTWORK UNDER THIS DIVISION TO PREVENT CONFLICT AND REMOVE AND RELOCATE WORK AS MAY BE MADE NECESSARY BY SUCH CONFLICT AT NO EXTRA COST TO OWNER.

F. UNLESS EXPRESSLY PERMITTED BY ENGINEER OR SHOWN OTHERWISE ON THE DRAWINGS, ALL PIPING, VENT PIPING, DUCTWORK AND SIMILAR ITEMS SHALL BE INSTALLED SO THAT THEY ARE CONCEALED EXCEPT AS PERMITTED BY THE ENGINEER IN SERVICE ROOMS NOTED ON DRAWINGS.

G. THE OWNER OR OWNER'S REPRESENTATIVE RESERVES THE RIGHT TO RELOCATE TERMINAL EQUIPMENT SIX (6) FEET IN ANY DIRECTION FROM LOCATIONS INDICATED ON THE PLANS, BEFORE ROUGHING-IN, WITH NO CHANGE IN CONTRACT PRICE

1.4 APPROVAL OF MATERIAL

A. ITEMS SPECIFIED HAVE BEEN CHECKED BY THE ENGINEER FOR PERFORMANCE AND SPACE LIMITATIONS.

B. UNLESS THE WORDS "APPROVED EQUAL" APPEAR. CONTRACTOR IS TO CHOOSE FORM A LIST OF MANUFACTURERS MENTIONED AND STATE TO MAKE OF EQUIPMENT HE INTENDS TO PURCHASE ON A SHEET PROVIDED AT THE TIME OF CONTRACT SIGNING.

C. IN ORDER TO ENGINEER TO CONSIDER "EQUAL", CONTRACTOR MUST CERTIFY BY LETTER THAT HE HAS CHECKED THE PRODUCT FOR CONFORMANCE TO SPECIFICATIONS AND SPACE LIMITATIONS AND ASSUMES FULL RESPONSIBILITY THEREAFTER.

D. ENGINEER, NOT CONTRACTOR OR VENDOR, SHALL BE THE FINAL JUDGE OF EQUAL MATERIALS. WHERE PRODUCT IS NOT CONSIDERED EQUAL BY THE ENGINEER, CONTRACTOR MAY OFFER A CREDIT TO THE OWNER FOR FURTHER CONSIDERATION.

E. REQUESTS FOR SUBSTITUTIONS MUST BE MADE IN WRITING TEN (10) DAYS PRIOR TO BID DATE SO THAT AN ADDENDUM MAY REACH ALL CONTRACTORS.

F. IF SUBSTITUTIONS ARE PROPOSED AFTER THE BIDS ARE RECEIVED, THE CONTRACTOR SHALL STATE AMOUNT OF CREDIT TO THE OWNER FOR SUBSTITUTION.

G. WHERE EQUIPMENT REQUIRING DIFFERENT ARRANGEMENT OF CONNECTIONS FROM THOSE SHOWN IS APPROVED, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO FURNISH REVISED LAYOUTS, IF REQUESTED, AND INSTALL THE EQUIPMENT TO OPERATE PROPERLY AND IN HARMONY WITH THE INTENT OF THE DRAWINGS AND SPECIFICATIONS, AND TO MAKE ALL CHANGES IN THE WORK REQUIRED BY THE DIFFERENT ARRANGEMENT OF THE CONNECTIONS AT NO ADDITIONAL COST OF THE OWNER. ALSO COORDINATE CONTROL AND POWER WIRING AND PAY FOR ANY CHANGES IMPOSED ON THE OTHER TRADES BY THESE CHANGES.

H. UPON APPROVAL OR EQUIPMENT LIST BY ENGINEER, COPIES OF SUBMITTAL PRINTS SHALL BE FORWARDED TO ENGINEER WITHIN 30 DAYS.

1.5 PERMITS, CODES AND ORDINANCES

A. THE CONTRACTOR SHALL ARRANGE AND PAY FOR ALL PERMITS, INSPECTIONS, ETC., AS REQUIRED BY LOCAL UTILITIES OR APPLICABLE AGENCIES.

B. ALL WORK AND MATERIAL SHALL BE IN COMPLETE ACCORDANCE WITH THE ORDINANCE, REGULATIONS, CODES, ATC. OF ALL POLITICAL ENTITIES EXERCISING JURISDICTIONS, SPECIFICALLY INCLUDING THE NEW YORK STATE ENERGY CODE.

C. IN EVENT OF DISCREPANCY, THE CONTRACTOR SHALL OBSERVE THE MORE STRINGENT REQUIREMENTS.

1.6 COORDINATION WITH OTHER TRADES

A. CHECK DIVISION 23 DRAWINGS WITH ALL OTHERS.

B. ANTICIPATE AND AVOID INTERFERENCE WITH OTHER TRADES.

C. OBTAIN DECISION FOR APPROVAL FROM PROJECT INSPECTOR FOR PROPOSED GROUP INSTALLATION BEFORE PROCEEDING, AND FOR CLEARANCE IN STRUCTURE AND FINISH IN BUILDING.

D. VERIFY WITH DRAWINGS IF REQUIRED.

E. RUNNING PIPE OVER ELECTRICAL EQUIPMENT IS PROHIBITED. SPECIAL CASES MAY BE PERMITTED WITH PROTECTING COPPER DRIP PAN. OBTAIN ENGINEER'S APPROVAL.

1.7 DELIVERY, STORAGE AND HANDLING

A. DELIVERY OF MATERIALS: MAKE PROVISIONS FOR DELIVERY AND SAFE STORAGE OF ALL MATERIALS. CHECK AND PROPERLY RECEIPT MATERIAL TO BE "FURNISHED BY OTHERS" TO CONTRACTOR AND ASSUME FULL RESPONSIBILITY FOR ALL MATERIALS WHILE IN STORAGE WITH FULL VISIBLE IDENTIFICATION AND INFORMATION.

1.8 PROJECT CONDITIONS

A. EXISTING CONDITIONS: FIELD VERIFY EXISTING CONDITIONS THAT WILL DETERMINE EXACT LOCATIONS, DISTANCES, LEVELS, DIMENSIONS, ELEVATIONS, ETC. REVIEW ALL DRAWINGS OF OTHER TRADES AND REPORT AND CONFLICTS TO THE ENGINEER WHICH WILL AFFECT THE PROJECT COSTS.

SECTION 233113 - METAL DUCTS

PART 1 - GENERAL

1.1 SUMMARY

A. SECTION INCLUDES:
1. SINGLE WALL RECTANGULAR DUCTS AND FITTINGS
2. SINGLE WALL ROUND DUCTS AND FITTINGS
3. SHEET METAL MATERIALS
4. SEALANT AND GASKETS
5. HANGERS AND SUPPORTS

1.2 PERFORMANCE REQUIREMENTS

A. DELEGATED DUCT DESIGN: DUCT CONSTRUCTION, INCLUDING SHEET METAL THICKNESS, SEAM AND JOINT CONSTRUCTION, REINFORCEMENTS, AND HANGER AND SUPPORTS, SHALL COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE" AND PERFORMANCE REQUIREMENTS AND DESIGN CRITERIA INDICATED IN DUCT SCHEDULE" ARTICLE.

1.3 ACTION SUBMITTALS

A. PRODUCT DATA: FOR EACH TYPE OF THE FOLLOWING PRODUCTS:
1. SEALANT AND GASKETS

B. SHOP DRAWINGS:
1. FABRICATION, ASSEMBLY AND INSTALLATION, INCLUDING PLANS, ELEVATIONS, SECTIONS AND COMPONENTS AND ATTACHMENTS TO OTHER WORK.
2. FACTORY- AND SHOP-FABRICATED DUCTS AND FITTINGS
3. DUCT LAYOUT INDICATING SIZES, CONFIGURATION, AND STATIC PRESSURE CLASSES.
4. ELEVATION OF TOP OF DUCTS
5. DIMENSIONS OF MAIN DUCT RUNS FROM BUILDING GRID LINES
6. FITTINGS
7. REINFORCEMENT AND SPACING
8. SEAM AND JOINT CONSTRUCTION
9. LOCATIONS OF DUCT ACCESSORIES, INCLUDING DAMPERS, TURNING VANES AND ACCESS DOORS AND PANELS
10. HANGERS AND SUPPORTS, INCLUDING METHODS FOR DUCT AND BUILDING ATTACHMENT

1.4 INFORMATIONAL SUBMITTALS

A. COORDINATION DRAWINGS: PLANS, DRAWN TO SCALE, ON WHICH THE FOLLOWING ITEMS ARE SHOWN AND COORDINATED WITH EACH OTHER, PERSUING INPUT FOR INSTALLERS OF THE ITEMS INVOLVED:
1. DUCT INSTALLATION IN CONGESTED SPACES, INDICATING COORDINATION WITH GENERAL CONSTRUCTION, BUILDING COMPONENTS, AND OTHER BUILDING SERVICES. INDICATE PROPOSED CHANGES TO DUCT LAYOUT
2. SUSPENDED CEILING COMPONENTS
3. STRUCTURAL MEMBERS TO WHICH DUCT WILL BE ATTACHED
4. SIZE AND LOCATION OF INITIAL ACCESS MODULES FOR ACOUSTICAL TILE
5. ITEMS PENETRATING FINISHED CEILING INCLUDING THE FOLLOWING:
A. LIGHTING FIXTURES
B. AIR OUTLETS
C. SPRINKLERS
D. ELECTRICAL TELECOMMUNICATION AND LIGHTING CONTROL DEVICES

PART 2 - PRODUCTS

2.1 SINGLE WALL RECTANGULAR DUCTS AND FITTINGS

A. GENERAL FABRICATION REQUIREMENTS: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE" BASED ON INDICATED STATIC PRESSURE CLASS UNLESS OTHERWISE INDICATED.

B. TRANSVERSE JOINTS: SELECT JOINT TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 2-1, "RECTANGULAR DUCT TRANSVERSE JOINTS," FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE"

C. LONGITUDINAL SEAMS: SELECT SEAM TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE." FIGURE 2-2, RECTANGULAR DUCT/LONGITUDINAL SEAMS," FOR STATIC PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."

D. ELBOWS, TRANSITIONS, OFFSETS, BRANCH CONNECTIONS, AND OTHER DUCT CONSTRUCTION: SELECT TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," CHAPTER 4, FITTINGS AND OTHER CONSTRUCTION," FOR STATIC-PRESSURE CLASS APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."

2.2 SINGLE-WALL ROUND DUCTS AND FITTINGS

A. GENERAL FABRICATION REQUIREMENTS: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE." CHAPTER 3. "ROUND, OVAL AND FLEXIBLE DUCT" BASED ON INDICATED STATIC PRESSURE CLASS OTHERWISE INDICATED.
1. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODCUTS BY ONE OF THE FOLLOWING:
A. MCGILL AIRFLOW LLC
B. SEMCO INCORPORATED
C. SHEET METAL CONNECTORS, INC.

B. TRANSVERSE JOINTS: SELECT JOINTS AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE, " FIGURE 3-1 "ROUND DUCT TRANSVERSE JOINTS," FOR STATIC PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."

C. LONGITUDINAL SEAMS: SELECT SEAM TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 3-2, "ROUND DUCT LONGITUDINAL SEAMS," FOR STATIC PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS AND OTHER PROVISIONS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE"

D. TEES AND LATERALS: SELECT TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 3-5, "90 DEGREE TEES AND LATERALS," AND FIGURE 3-6 "CONICAL TEES," FOR STATIC PRESSURE CLASS APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT SUPPORT INTERVALS AND OTHER PROVISIONS IN SMACNA "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."

2.3 SHEET METAL MATERIALS

A. GENERAL MATERIAL REQUIREMENTS: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE" FOR ACCEPTANCE MATERIALS, MATERIAL THICKNESS, AND DUCT CONSTRUCTION METHODS UNLESS OTHERWISE INDICATED, SHEET METAL MATERIALS SHALL BE FREE OF PITTING, SEAM MARKS, ROLLER MARKERS, STAINS, DISCOLORATIONS, AND OTHER IMPERFECTIONS.

B. GALVANIZED SHEET STEEL: COMPLY WITH ASTM A 653/A 653M.
1. GALVANIZED COATING DESIGNATION: G90 (Z275)
2.FINISHES FOR SURFACES EXPOSED TO VIEW: MILL PHOSPHATIZED

C. REINFORCEMENT SHAPES AND PLATES: ASTM A 36/ A 36M, STEEL PLATES, SHAPES AND BARS; BLACK AND GALVANIZED

2.4 SEALANT AND GASKETS

A. GENERAL SEALANT AND GASKET REQUIREMENTS: SURFACE-BURING CHARACTERISTICS FOR SEALANTS AND GASKETS SHALL BE A MAXIMUM FLAME-SPREAD INDEX OF 25 AND A MAXIMUM SMOKE-DEVELOPED INDEX OF 50 WHEN TESTED ACCORDING TO UL 723; CERTIFIED BY AN NRTL.

B. WATER BASED JOINT AND SEAM SEALANT:
1. APPLICATION METHOD: BRUSH ON
2. SOLIDS CONTENT: MINIMUM 65 PERCENT
3. SHORE A HARDNESS: MINIMUM 20
4. WATER RESISTANT
5. MOLD AND MILDEW RESISTANT
6. VOC: MAXIMUM 75 G/L (LESS WATER)
7. MAXIMUM STATIC PRESSURE CLASS: 10-INCH WG (2500 PA), POSITIVE AND NEGATIVE
8. SERVICE: INDOOR OR OUTDOOR
9. SUBSTRATE: COMPATIBLE WITH GALVANIZED SHEET STEEL, STAINLESS STEEL OR ALUMINUM SHEETS

2.5 HANGERS AND SUPPORTS

A. HANGER RODS FOR NON-CORROSIVE ENVIRONMENTS: CADMIUM-PLATES STEEL RODS AND NUTS

B. STRAP AND ROD SIZES: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," TABLE 5-1 (TABLE 5-1M) "RECTANGULAR DUCT HANGERS MINIMUM SIZE," AND TABLE 5-2, "MINIMUM HANGER SIZE FOR ROUND DUCTS."

C. DUCT ATTACHMENTS: SHEET METAL SCREWS, BLIND RIVETS, OR SELF-TAPPING METAL SCREW; COMPATIBLE WITH DUCT MATERIALS.

D. TRAPEZE AND RISER SUPPORTS:
1. SUPPORTS FOR GALVANIZED-STEEL DUCTS: GALVANIZED-STEEL SHAPES AND PLATES

PART 3 - EXECUTION

3.1 DUCT INSTALLATION

A. DRAWING PLANS, SCHEMATICS, AND DIAGRAMS INDICATE GENERAL LOCATION AND ARRANGEMENT OF DUCT SYSTEMS. INDICATE DUCT LOCATIONS, CONFIGURATIONS AND ARRANGEMENTS WERE USED TO SIZE DUCTS AND CALCULATE FRICTION LOSS FOR AIR0HANDLING EQUIPMENT SIZING AND FOR OTHER DESIGN CONSIDERATIONS. INSTALL DUCT SYSTEMS AS INDICATED UNLESS DEVIATIONS TO LAYOUT ARE APPROVED ON SHOP DRAWINGS AND COORDINATION DRAWINGS.

B. INSTALL DUSTS ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE" UNLESS OTHERWISE INDICATED.

C. INSTALL ROUND DUCTS IN MAXIMUM PRACTICAL LENGTHS.

D. INSTALL DUCTS WITH FEWEST POSSIBLE JOINTS

E. INSTALL FACTORY- OR SHOP-FABRICATED FITTINGS FOR CHANGES IN DIRECTION, SIZE, AND SHAPE AND FOR BRANCH CONNECTIONS.

F. UNLESS OTHERWISE INDICATED, INSTALL DUCTS VERTICALLY AND HORIZONTALLY, AND PARALLEL AND PERPENDICULAR TO BUILDING LINES.

G. INSTALL DUCTS CLOSE TO WALLS, OVERHEAD CONSTRUCTION, COLUMNS, AND OTHER STRUCTURAL AND PERMANENT ENCLOSURE ELEMENTS OF BUILDING

H. INSTALL DUCTS WITH A CLEARANCE OF 1 INCH (25 MM) PLUS ALLOWANCE FOR INSULATION THICKNESS.

3.2 DUCT SEALING

A. SEAL DUCTS FOR DUCT STATIC-PRESSURE, SEAL CLASSES, AND LEAKAGE CLASSES SPECIFIED IN "DUCT SCHEDULE" ARTICLE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE"

B. SEAL DUCTS TO THE FOLLOWING SEAL CLASSES ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS 0 METAL AND FLEXIBLE":
1. COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE"
2. INDOOR SUPPLY AIR DUCTS: SEAL CLASS B

3.3 HANGER AND SUPPORT INSTALLATION

A. COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," CHAPTER 5, "HANGERS AND SUPPORTS."

3.4 DUCT SCHEDULE

A. FABRICATE DUCTS WITH GALVANIZED SHEET STEEL EXCEPT AS OTHERWISE INDICATED AND AS FOLLOWS:

B. SUPPLY DUCTS
1. DUCTS CONNECTED TO VARIABLE - AIR VOLUME SYSTEMS:
A. PRESSURE CLASS: POSITIVE 2-INCH WG (500 PA)
B. MINIMUM SMACNA SEAL CLASS: B
C. SMACNA LEAKAGE CLASS FOR RECTANGULAR: 12
D. SMACNA LEAKAGE CLASS FOR ROUND: 12

SECTION 238123 - COMPUTER-ROOM AIR-CONDITIONERS

PART 1 - GENERAL

1.1 SUMMARY

A. SECTION INCLUDES:
1. CEILING-MOUNTED COMPUTER-ROOM AIR CONDITIONERS.

1.2 ACTION SUBMITTALS

A. PRODUCT DATA: FOR EACH TYPE OF PRODUCT INDICATED. INCLUDE RATED CAPACITIES, OPERATING CHARACTERISTICS, ELECTRICAL CHARACTERISTICS, AND FURNISHED SPECIALTIES AND ACCESSORIES.

B. SHOP DRAWINGS: FOR COMPUTER-ROOM AIR CONDITIONERS. INCLUDE PLANS, ELEVATIONS, SECTIONS, DETAILS, AND ATTACHMENTS TO OTHER WORK.
1. DETAIL EQUIPMENT ASSEMBLIES AND INDICATE DIMENSIONS, WEIGHTS, LOADS, REQUIRED CLEARANCES, METHOD OF FIELD ASSEMBLY, COMPONENTS, AND LOCATION AND SIZE OF EACH FIELD CONNECTION.
2. WIRING DIAGRAMS: FOR POWER, SIGNAL, AND CONTROL WIRING.

PART 2 - PRODUCTS

2.1 CEILING MOUNTED UNITS

A. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
1. CARRIER CORPORATION; A UNITED TECHNOLOGIES COMPANY.
2. LIEBERT CORPORATION.
3. MCQUAY INTERNATIONAL.

B. DESCRIPTION

THE ENVIRONMENTAL CONTROL SYSTEM SHALL BE A FACTORY ASSEMBLED UNIT. THE REFRIGERATION SYSTEM SHALL BE SPLIT, WITH THE COMPRESSOR LOCATED IN A REMOTE CONDENSING UNIT. THE EVAPORATOR SECTION SHALL BE SPECIFICALLY DESIGNED FOR CEILING INSTALLATION AND SERVICEABLE. CONDENSING UNITS SHALL BE DESIGNED FOR OUTDOOR MOUNTING.

THE SYSTEMS SHALL BE CAPABLE OF DELIVERY 600 CFM. THE CIRCULATING-AIR FAN SHALL BE TWO-SPEED FOR PRECISE DEHUMIDIFICATION CONTROL. THE SYSTEM SHALL BE DESIGNED FOR BLOW-THROUGH AIR ARRANGEMENT.

THE SYSTEM SHALL HAVE A TOTAL COOLING CAPACITY OF 18000 BTU/HR (KW), AND A SENSIBLE COOLING CAPACITY OF ____ BTU/HR (KW). BASED ON THE ENTERING AIR CONDITION OF 72°F (°C) DRY BULB, AND 50% RH. THESE UNITS ARE SUPPLIED WITH 240 VOLT, 1 PH, 60 HZ POWER SUPPLY.

C. REFRIGERATION SYSTEM:
1. COMPRESSOR: HERMETIC, WITH OIL STRAINER, INTERNAL MOTOR OVERLOAD PROTECTION, RESILIENT SUSPENSION SYSTEM, AND CRANKCASE HEATER.
2. REFRIGERATION CIRCUIT: LOW-PRESSURE SWITCH, MANUAL-RESET HIGH-PRESSURE SWITCH, THERMAL-EXPANSION VALVE WITH EXTERNAL EQUALIZER, SIGHT GLASS WITH MOISTURE INDICATOR, SERVICE SHUTOFF VALVES, CHARGING VALVES, AND CHARGE OF REFRIGERANT.
3. REFRIGERANT: R-407C.

D. OUTDOOR AIR-COOLED PROP FAN CONDENSING UNIT
1. CONDENSING UNIT COMPONENTS SHALL INCLUDE A CONDENSER COIL, A DIRECT-DRIVE PROPELLER-TYPE FAN, A SCROLL COMPRESSOR, HIGH-PRESSURE SWITCH, LIEBERT LEE-TEMP RECEIVER AND HEAD PRESSURE CONTROL VALVE, HOT GAS BYPASS SYSTEM AND LIQUID LINE SOLENOID VALVE. A HOT GAS BYPASS SYSTEM SHALL BE PROVIDED TO REDUCE COMPRESSOR CYCLING AND IMPROVE OPERATION UNDER LOW LOAD CONDITIONS.
2. ALL COMPONENTS SHALL BE FACTORY-ASSEMBLED, CHARGED WITH R-407C REFRIGERANT AND SEALED. NO INTERNAL PIPING, BRAZING, DEHYDRATION OR CHARGING SHALL BE REQUIRED. CONDENSING UNIT SHALL BE DESIGNED FOR 95°F (35°C) AMBIENT AND BE CAPABLE OF OPERATION TO -30°F (-34.4°C).
3. THE CONDENSER COIL SHALL BE CONSTRUCTED OF COPPER TUBES AND ALUMINUM FINS.
4. THE CONDENSER COIL SHALL BE PHENOLIC-COATED FOR EXTENDED COIL LIFE IN COASTAL AREAS.

E. ELECTRIC HEAT
1. THE ELECTRIC REHEAT SHALL BE LOW-WATT DENSITY, TUBULAR ELEMENT AND SHALL INCLUDE AGENCY APPROVED SAFETY SWITCH TO PROTECT THE SYSTEM FROM OVERHEATING. THE CAPACITY OF THE REHEAT COIL SHALL BE _____ BTU/HR, 40 KW, CONTROLLED IN 1 STAGE.

END OF SECTION 238123

SECTION 221319 - SANITARY WASTE PIPING SPECIALITIES

PART 1 - GENERAL

1.1 SUMMARY

A. THIS SECTION INCLUDES THE FOLLOWING SANITARY DRAINAGE PIPING SPECIALTIES WITHIN THE BUILDING:
1. TRENCH DRAINS.

PART 2 - PRODUCTS

2.1 TRENCH DRAINS

A. TRENCH
1. BASIS-OF-DESIGN PRODUCT: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE THE PRODUCT INDICATED ON DRAWINGS OR A COMPARABLE PRODUCT BY ONE OF THE FOLLOWING:
a. JOSAM COMPANY; JOSAM DIV.
b. SMITH, JAY R. MFG. CO.; DIVISION OF SMITH INDUSTRIES, INC.
c. WATTS DRAINAGE PRODUCTS, INC.
d. ZURN PLUMBING PRODUCTS GROUP; SPECIFICATION DRAINAGE OPERATION.
2. STANDARD: ASME A112.6.3 FOR TRENCH DRAINS.
3. MATERIAL: 0% WATER ABSORBENT HIGH DENSITY POLYETHYLENE
4. FLANGE: ANCHOR.
5. CLAMPING DEVICE: REQUIRED.
6. OUTLET: END.
7. GRATE MATERIAL: DUCTILE IRON.
8. GRATE FINISH: GALVANIZED.
9. DIMENSIONS OF FRAME AND GRATE: 12" WIDE GRATE.
10. TOP LOADING CLASSIFICATION: HEAVY DUTY.
11. BOTTOM DOME STRAINER.

PART 3 - EXECUTION

3.1 INSTALLATION

A. INSTALL TRENCH DRAINS AT LOW POINTS OF SURFACE AREAS TO BE DRAINED. SET GRATES OF DRAINS FLUSH WITH FINISHED SURFACE, UNLESS OTHERWISE INDICATED.

B. ASSEMBLE CHANNEL DRAINAGE SYSTEM COMPONENTS ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS. INSTALL ON SUPPORT DEVICES SO THAT TOP WILL BE FLUSH WITH ADJACENT SURFACE.

END OF SECTION 221319

DESIGNED: CMS CADD CMS TECH. REVIEW: DATE: 05/14/2013	SUB SHEET NO. M2	TITLE OF SHEET MECHANICAL SPECIFICATIONS FREDERICKSBURG AND SPOTSYLVANIA NATIONAL MILITARY PARK, VIRGINIA	DRAWING NO. ——— PMIS/PKG NO. 143495 SHEET 10 OF 12