

Combined Heat and Power (CHP) and New Steam Generation System
Atlanta VA Medical Center, Decatur, Georgia
Issued for Bid - 18 April 2014 (Updated - 6 June 2014)

ADDENDUM 01

TO ALL DOCUMENT HOLDERS:

Subject: Combined Heat & Power Plant and New Steam Generation System, Atlanta VA Medical Center, DeKalb, GA

VA Task Order: VA701-13-R-0054

URS Job No.: 15290200

Enclosed herewith is Addendum No. 1 covering URS' responses to RFP Technical Question sets one (1), two (2), and three (3). Addendum No. 1 includes this document as well as the below noted specifications, drawings, and sketches.

Sincerely,

URS Group, Inc.

A handwritten signature in black ink, appearing to read "Jeffrey F. Rouleau".

Jeffrey F Rouleau, P.E.
Project Manager

Attachments:

Specifications:

04 86 00 STONE VENEER ASSEMBLIES
07 21 13 THERMAL INSULATION
11 13 13 FULL-LENGTH LAMINATED DOCK BUMPERS AND COLUMN PROTECTION
12 31 00 MANUFACTURED METAL CASEWORK
12 93 00 SITE FURNISHINGS
32 33 13 PERIMETER SECURITY FENCES AND GATES

Drawings:

LP-102

Sketches:

SK-01
SK-02
SK-03

ADDENDUM TO THE BIDDING DOCUMENTS FOR
COMBINED HEAT AND POWER PLANT (CHP) AND NEW STEAM GENERATION SYSTEM
ATLANTA VA MEDICAL CENTER, DECATUR, GEORGIA

1.1 GENERAL

- A. This Bulletin covers changes to the Documents and in closing the Contract will become a part thereof. Each Bidder shall include these items to the extent they affect his Bid.
- B. These items modify only the portion of the Documents specifically noted. All other wording and Drawings remain in effect.

1.2 PROJECT MANUAL

- A. SECTION 00 01 10, TABLE OF CONTENTS
 - 1. ADD Section 04 86 00 STONE VENEER ASSEMBLIES
 - 2. REMOVE Section 07 18 13 TRAFFIC COATING
 - 3. ADD Section 07 21 13 THERMAL INSULATION
 - 4. ADD Section 11 13 13 FULL-LENGTH LAMINATED DOCK BUMPERS AND COLUMN PROTECTION
 - 5. ADD Section 12 31 00 MANUFACTURED METAL CASEWORK
 - 6. ADD Section 12 93 00 SITE FURNISHINGS
 - 7. REMOVE 32 14 16 BRICK PAVERS
 - 8. ADD Section 32 33 13 PERIMETER SECURITY FENCES AND GATES
 - 9. RENAME Section 32 60 00 GARDEN ROOF to 32 60 00 LANDSCAPING
- B. SECTION 04 86 00 STONE VENEER ASSEMBLIES
 - 1. This Specification section is being issued as an attachment to Addendum No. 1.
- C. SECTION 07 12 00 BUILT-UP BITUMINOUS WATERPROOFING
 - 1. Page 1, Section 1.1 Description, modified as follows: ADD: *"elevator shaft foundation walls"* to the end of the sentence.
- D. SECTION 07 21 13 THERMAL INSULATION
 - 1. This Specification Section is being issued as an attachment to Addendum No. 1.
- E. SECTION 07 55 56 PROTECTED HOT FLUID APPLIED RUBBERIZED ASPHALT ROOFING SYSTEM FOR INTENSIVE GARDEN ROOF INSTALLATION
 - 1. Page 3 Article 1.5 SYSTEM DESCRIPTION Article A. ADD the following to this paragraph: "The installed system to include all pavers, pedestals, curbs and other accessories provided by a single manufacturer and covered by an inclusive single warranty."
 - 2. Page 7 & 8 1.10 WARRANTY Article C. Total System Warranty is changed as follows:
 - a. 1. Duration of Membrane/Flashing and replacement of Hydrotech supplied roof substrate board from date of installation: note the following selection: ":" ~~5, 10, 15, 20~~, 30-year (watertight condition)"

- b. 2. "Duration of Insulation from date of purchase:" note the following selection: " ~~5-, 10-, 15-,~~ 20-, ~~30-~~ year "80% of original thermal value; remain on the deck withstanding wind speeds not to exceed 70 mph gust wind speed"
- c. 3. "Material Integrity of Garden Roof® Components from date of purchase:" Note the following selection: "~~5-, 10-~~
~~-, 15-~~, 20-year"
- d. 4. "Duration of Pavers from date of purchase:" Note the following selection: "~~5-~~, 10-year (will not crack, split or disintegrate due to freeze-thaw)"

F. SECTION 09 24 00, PORTLAND CEMENT PLASTER (STUCCO)

- 1. Page 1, 1.1 description clarified as follows: *"This section specifies lathing and 3 coat Portland cement based plaster systems (stucco)."*
- 2. Page 1, RELATED WORK ADD clarifying text as follows:
 - a. E. Metal framing: 05 40 00 COLD FORMED METAL FRAMING
 - b. F. Exterior glass mat faced sheathing: 09 29 00 GYPSUM BOARD
 - c. G. Batt Insulation: 07 21 13 THERMAL INSULATION
 - d. Page 4, Article 2, products changed as follows:
- 3. Page 4, PRODUCTS
 - a. Change heading: "Section 2.8 FACTORY PREPARED FINISH COAT FOR CEMENT PLASTER (STUCCO)" changed to: "Section 2.8 BASECOATS"
 - 1) Add the following paragraph: "A. Base coats, scratch and brown, can be either field mixed or use pre-mixed, bagged meeting the standards of ASTM C926, Application of Portland Cement Plaster, and the above mix criteria".
 - b. Change heading: "Section 2.8 FACTORY PREPARED FINISH COAT FOR CEMENT PLASTER (STUCCO)" changed to: "Section 2.9 FACTORY PREPARED FINISH COAT FOR CEMENT PLASTER (STUCCO)"
 - 1) ADD the following to this paragraph: "A. Acrylic Finish: Pre-blended and colored by a manufacturer of EIMA (EIFS Industry Members Association)" *DELETE*: "Factory prepared dry blend of materials, integrally colored, designed for exterior finish coat application".
 - 2) B. Changed as follows: "Texture and color selection by Architect". *DELETE*: "Pigments: ASTM C979, lime proof mineral oxide."
 - 3) C. 1) ADD the following to this paragraph: "Bonding agent applied per manufacturer (as required) to Portland Cement plaster base to meet performance requirements of Cement plaster." Delete : "Not more than 35 percent, by weight of all ingredients (cement, aggregate, hydrated lime, admixture and coloring pigment) shall pass a number 100 sieve."
 - c. Change heading: "2.9 ADMIXTURES" TO: "2.10 ADMIXTURES"
- 4. Page 8, Article 3.5. PORTLAND CEMENT BASED PLASTER, Factory prepared finish coat ADD the following to this paragraph: 4.

4. Factory prepared finish coat: ADD the following: "Prepare per manufacturer's instructions" DELETE : "Add water, mix,"

G. SECTION 10 26 00 WALL AND DOOR PROTECTION

1. Page 1, Section 1.1 DESCRIPTION, ADD handrail/wallguard combinations and high impact wallcovering.
2. Page, 1, Section 1.3 SUBMITTALS, ADD 3. High Impact Wall covering and 4. Handrail/Wall Guard Combinations.
3. Page 3, Section 2.2 CORNER GUARDS, ADD the following:

PART 2 B. Resilient, Shock-Absorbing Corner Guards: Surface Mounted, profile formed to match existing corner guards.

PART 3 1. snap-on corner guard formed from resilient material, minimum 2 mm (0.078-inch) thick, free floating on a continuous 1.6 mm (0.063-inch) thick extruded aluminum retainer. Design retainer used for flush mounted type to act as a stop for adjacent wall finish material. Provide appropriate mounting hardware, cushions and base plates as required.

PART 4 2. Provide factory fabricated end closure caps at top and bottom of surface mounted corner guards.

PART 5 3. Flush mounted corner guards installed on any fire rated wall shall maintain the fire rating of the wall. Provide fire test of proposed corner guard system to verify compliance.

PART 6 a. Where insulating materials are an integral part of the corner guard system, the insulating materials shall be provided by the manufacturer of the corner guard system.

PART 7 b. All exposed metal in fire rated assemblies shall have a paintable finish.

PART 8 4. Basis of Design: C/S Acrovyn 4000 Model SSM-20AN with solid color finish to match existing.

PART 9 Page 3, Section 2.3 WALL GUARDS AND HANDRAILS, ADD the following:

PART 10 B. Resilient Wall Guards and Handrails:

PART 11 1. Handrail/Wall Guard Combination: Snap-on covers of resilient material, minimum 2 mm (0.078-inch) thick, shall be free-floated on a continuous, extruded aluminum retainer, minimum 1.8 mm (0.072-inch) thick, anchored to wall at maximum 760 mm (30 inches) on center.

PART 12 2. Basis of Design: C/S Acrovyn 4000 HRB-10CN with Chameleon pattern color to match existing.

PART 13 3. Provide handrails and wall guards (crash rails) with prefabricated and closure caps, inside and outside corners, concealed splices, cushions, mounting hardware and other accessories as required. End caps and corners shall be field adjustable to assure close alignment with handrails and wall guards (crash rails). Screw or bolt closure caps to aluminum retainer.

4. Page 4, ADD new section:

2.4 HIGH IMPACT WALL COVERING

- A. Fabricate from vinyl acrylic or polyvinyl chloride resilient material minimum 6mm (0.06 inch) thick designed specially for interior use.
- B. Coordinate with guard rail protection material and supplier for proper fit, installation and color.
- C. Provide adhesive as recommended by the wall covering manufacturer.
- D. Use manufacturer's standard trim pieces for wainscot trim, vertical joints, inside corners, and outside corners.
- E. Basis of Design: C/S Acrovyn 4000 0.60N 4' x 10' rigid sheet in solid color to match existing.

5. Page 4, change section FASTENERS AND ANCHORS to 2.5 and change section FINISH to 2.6.

6. Page 4, 2.6 FINISH, ADD D. Resilient Material: Embossed texture and color in accordance with SAE J 1545 and as specified in Section 09 06 00, SCHEDULE FOR FINISHES.

7. Page 5, ADD new sections 3.4 and 3.5 as follows:

3.4 RESILIENT HANDRAIL / WALL GUARD COMBINATIONS.

- A. Secure guards to walls with mounting cushions, brackets, and fasteners in accordance with manufacturer's details and instructions.

3.5 HIGH IMPACT WALL COVERING

- A. Surfaces to receive protection shall be clean, smooth and free of obstructions.
- B. Install protectors after frames are in place but preceding installation of doors in accordance with

approved shop drawings and manufacturers specific instructions.

C. Apply with adhesive in controlled environment according to manufacturer's recommendations.

D. Protection installed on fire rated doors and frames shall be installed according to NFPA 80 and installation procedures listed in UL Building Materials Directory; or, equal listing by other approved independent testing laboratory establishing the procedures.

A. SECTION 11 13 13 FULL DOCK-LENGTH LAMINATED DOCK BUMPERS AND COLUMN PROTECTION.

1. This new Specification Section is being issued as an attachment to this addendum.

B. SECTION 12 31 00 MANUFACTURED METAL CASEWORK

1. This new Specification Section is being issued as an attachment to this addendum.

C. SECTION 12 93 00 SITE FURNISHINGS

1. This new Specification Section is being issued as an attachment to this addendum.

D. SECTION 32 31 13 PERIMETER SECURITY FENCES AND GATES

1. This new Specification Section is being issued as an attachment to this addendum.

E. SECTION 48 20 10, NATURAL GAS-FUELED COMBINED HEAT AND POWER FACILITY GENERAL REQUIREMENTS

1. Section 1.4 Quality Assurance ~~DELETE~~ subsections B in its entirety.

2. Section 2.2 B iv. Replace Emissions Requirements with the Following:

Emissions of the noted pollutants for the CHP facility specified herein Emissions of the noted pollutants for the CHP facility specified herein shall be guaranteed not to exceed the following tables. If no value for a pollutant is given in the tables below, the emissions shall comply with local, state and federal emission limit requirements.

Emission limits per NSPS Subpart 4J for the Pre-control for the engines.

Emission Standards (g/hp-hr)		
NOx	CO	VOC
1.0	2.0	0.7

Post-control emission standards shall be the following
(with a minimum 90% control for NOx and a minimum 60% for
CO and VOC). These reductions are used to obtain the
synthetic minor permit for the site.

Emission Standards (g/hp-hr)		
NOx	CO	VOC
0.1	0.4	0.3

3. Section 3.9 *CHANGE* CHP System Guarantee Period Services
reducing the Warrantee Period to one (1) year from date of
final acceptance by the VA Contracting Officer.

13.2 PROJECT DRAWINGS (Attached)

- A. *ADD* Sheet LP-102 VEGETATED ROOF GRADING & LAYOUT PLAN.
- B. SK-01 - *ADD* detail indicating dimensions on cast in place concrete
roof curb 3/AS-402
- C. SK-02 - *ADD* detail for curb reinforcing to drawing SS-603, Steel
Section and Details (Sheet 3 of 3)
- D. SK-03 - Edit Drawing MH-301 to include additional flex connectors to
the exhaust system at changes of direction and connection to
equipment.

--- END OF ADDENDUM NO. 1 ----

SECTION 048600 - STONE VENEER ASSEMBLIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes stone veneer in the following applications:
 - 1. Adhered with mortar to unit masonry backup.
- B. Related Sections include the following:
 - 1. Division 3 Section "Cast-in-Place Concrete" for dovetail slots in concrete for anchoring stone veneer.
 - 2. Division 4 Section "Unit Masonry Assemblies" for concealed flashing, horizontal joint reinforcement, and veneer anchors.
 - 3. Division 7 Section "Building Insulation" for insulation installed between stone veneer assemblies and backup material.
 - 4. Division 7 Section "Sheet Metal Flashing and Trim" for exposed sheet metal flashing.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Product submittals to be approved by Architect prior to purchasing bulk quantity.
- B. Stone Samples for Verification: For each color, grade, finish, and variety of stone required.
- C. List of Materials Used in Constructing Mockups: List generic product names together with manufacturers, manufacturers' product names, sources of supply, and other information as required to identify materials used. Include mix proportions for mortar and source of aggregates.
 - 1. Submittal is for information only. Neither receipt of list nor approval of mockups constitutes approval of deviations from the Contract Documents unless such deviations are specifically brought to the attention of Architect and approved in writing.
- D. Qualification Data: For Installer.

1.4 QUALITY ASSURANCE

- A. **Installer Qualifications:** An installer who employs experienced stone masons and stone fitters who are skilled in installing stone veneer assemblies similar in material, design, and extent to those indicated for this Project and whose projects have a record of successful in-service performance. Contractor to provide mockup of stone veneer wall for review and approval by Architect and or Owner.
- B. **Source Limitations for Stone:** Obtain each variety of stone, regardless of finish, from a single quarry with resources to provide materials of consistent quality in appearance and physical properties.
 - 1. Obtain each variety of stone from a single quarry.
- C. **Source Limitations for Mortar Materials:** Obtain ingredients of a uniform quality for each mortar component from a single manufacturer and each aggregate from one source or producer.
- D. **Mockups:** Build mockups to verify selections made under sample Submittals and to demonstrate aesthetic effects and qualities of materials and execution.
 - 1. Build mockups for each type of stone veneer assembly in sizes approximately 48 inches long by 24 inches high by full thickness, including face and backup.
 - a. Include stone coping at top of mockup.
 - b. Include through-wall flashing installed for a 24-inch length in corner of mockup approximately 16 inches down from top of mockup, with a 12-inch length of flashing left exposed to view (omit stone veneer above half of flashing).
 - 2. Protect accepted mockups from the elements with weather-resistant membrane.
 - 3. Approval of mockups is for color, texture, and blending of stone; relationship of mortar and sealant colors to stone colors; tooling of joints; and aesthetic qualities of workmanship.
 - a. Approval of mockups is also for other material and construction qualities specifically approved by Architect in writing.
 - b. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless such deviations are specifically approved by Architect in writing.
 - 4. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

- B. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- C. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.6 PROJECT CONDITIONS

- A. Protection of Stone Veneer Assemblies: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed stone veneer assemblies when construction is not in progress.
 - 1. Extend cover a minimum of 24 inches down both sides and hold cover securely in place.
- B. Stain Prevention: Immediately remove mortar and soil to prevent them from staining the face of stone veneer assemblies.
 - 1. Protect base of walls from rain-splashed mud and mortar splatter by coverings spread on the ground and over the wall surface.
 - 2. Protect sills, ledges, and projections from mortar droppings.
 - 3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
 - 4. Turn scaffold boards near the wall on edge at end of each day to prevent rain from splashing mortar and dirt on completed stone veneer assemblies.
- C. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen subgrade or setting beds. Remove and replace stone veneer assemblies damaged by frost or freezing conditions. Comply with cold-weather construction requirements contained in Section 2104.3 of the Uniform Building Code.
 - 1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and above and will remain so until masonry has dried, but not less than 7 days after completing cleaning.
- D. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

PART 2 - PRODUCTS

2.1 STONE SOURCES

- A. Varieties and Sources: Subject to compliance with requirements, provide one of the following stone varieties from one of the following sources:

- B. Varieties and Sources: Subject to compliance with requirements, provide stone of the following variety and from the following source:

1. Stone Type: Stacked and mortar in "Tennessee Field Stone", color range to be brown and beige.

2.2 MANUFACTURERS

- A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the products specified.
2. Products: Subject to compliance with requirements, provide one of the products specified.

2.3 STONE

- A. Other Stone: Provide stone that complies with the following physical characteristics:

1. Maximum Absorption, by Weight: 7.5 percent according to ASTM C 97.
2. Minimum Compressive Strength: 4000 psi according to ASTM C 170.

2.4 MORTAR MATERIALS

- A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated. Mortar to be recessed so that it is not visible from the front elevation of the wall.

1. Low-Alkali Cement: Not more than 0.60 percent total alkali when tested according to ASTM C 114.

- B. Hydrated Lime: ASTM C 207 Type S.

- C. Mortar Cement: ASTM C 1329.

- D. Aggregate: ASTM C 144 and as follows:

1. For pointing mortar, use aggregate graded with 100 percent passing No. 16 sieve.

- E. Mortar Pigments: Natural or synthetic iron oxides, compounded for use in mortar mixes and with a record of satisfactory performance in stone masonry mortars.

- F. Water: Potable.

2.5 VENEER ANCHORS

- A. Materials:

2.6 EMBEDDED FLASHING MATERIALS

- A. Metal Flashing: Fabricate from the following metal complying with requirements specified in Division 7 Section "Sheet Metal Flashing and Trim" and below:

1. Stainless Steel: 0.0156 inch thick.
2. Fabricate metal drip edges to extend at least 3 inches into wall and 1/2 inch out from wall, with a hemmed outer edge bent down 30 degrees.

- B. Available Products:

1. Metal Flashing:
 - a. Cheney Flashing Company; Cheney Flashing (Dovetail).
 - b. Cheney Flashing Company; Cheney Flashing (Sawtooth).
 - c. Keystone Flashing Co.; Keystone 3-Way Interlocking Thruwall Flashing.

2.7 MISCELLANEOUS MASONRY ACCESSORIES

- A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene or PVC.

- B. Weep Holes:

1. Wicking Material: Cotton or polyester rope, 1/4 to 3/8 inch (in diameter, in length required to produce 2-inch exposure on exterior and 18 inches in cavity behind stone veneer assembly.

- C. Cavity Drainage Material: 3/4-inch - thick, free-draining mesh made from polyethylene strands and shaped to avoid being clogged by mortar droppings.

2.8 MASONRY CLEANERS

- A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from stone masonry surfaces without discoloring or damaging masonry surfaces; expressly approved for intended use by "Tennessee Field Stone" producer.

2.9 STONE FABRICATION

- A. General: Fabricate stone in sizes and shapes necessary to comply with requirements indicated, including details on Drawings.
- B. Cut and Select stone to produce pieces of thickness, size, and shape indicated and to comply with fabrication and construction tolerances recommended by applicable stone association or, if none, by stone source, for faces, edges, beds, and backs.
 - 1. Clean sawed backs of stone to remove rust stains and iron particles.
 - 2. Thickness: 3 inches plus or minus 1/4 inch 1/2 inch. Thickness
- C. Dress joints bed and vertical straight and at right angle to face, unless otherwise indicated.
- D. Shape stone for type of masonry (pattern) as follows:
 - 1. Tennessee fieldstone "stacked stone appearance".
- E. Finish exposed faces and edges of stone to comply with requirements indicated for finish and to match approved samples and mockups.
 - 1. Finish: Rough-picked face with tooled boasted margin. Select one of five options in subparagraph below or revise to suit Project. Delete all if no copings or if copings have same finish as other stone.
 - 2. Finish for Copings: Sand-rubbed finish.
 - a. Finish exposed ends of copings same as front and back faces.
- F. Carefully inspect stone at quarry or fabrication plant for compliance with requirements for appearance, material, and fabrication. Replace defective units before shipment.

2.10 MORTAR MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.
 - 1. Do not use calcium chloride.
- B. Mortar for Stone Masonry: Comply with ASTM C 270, Property Specification.
 - 1. Limit cementitious materials in mortar to portland cement, mortar cement, and lime.
 - 2. Mortar for Setting Stone: Type S.
 - 3. Mortar for Pointing Stone: Type N.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces indicated to receive stone veneer assemblies, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
 - 1. Examine substrate to verify that dovetail slots, inserts, reinforcement, veneer anchors, flashing, and other items installed in unit masonry or concrete and required for or extending into stone veneer assemblies are correctly installed.
 - 2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Advise installers of other work about specific requirements for placement of reinforcement, veneer anchors, flashing, and similar items to be built into stone veneer assemblies.
- B. Coat concrete backup with asphalt dampproofing.
- C. Clean dirty or stained stone surfaces by removing soil, stains, and foreign materials before setting. Clean stone by thoroughly scrubbing with fiber brushes and then drenching with clear water. Use only mild cleaning compounds that contain no caustic or harsh materials or abrasives.

3.3 SETTING OF STONE VENEER, GENERAL

- A. Perform necessary field cutting as stone is set. Use power saws to cut stone. Cut lines straight and true, with edges eased slightly to prevent snipping.
- B. Sort stone before it is placed in wall to remove stone that does not comply with requirements relating to aesthetic effects, physical properties, or fabrication or that is otherwise unsuitable for intended use.
- C. Arrange stones for good fit in a stacked stone arrangement, with mortar recessed so it is not visible.
- D. Arrange stones with color and size variations uniformly dispersed for an evenly blended appearance.
- E. Set stone to comply with requirements indicated on Drawings. Install veneer anchors, supports, fasteners, and other attachments indicated or necessary to secure stone veneer assemblies in place. Set stone accurately in locations indicated with edges and faces aligned according to established relationships and indicated tolerances.
- F. Provide expansion, control, and pressure-relieving joints of widths and at locations indicated.

1. Keep expansion and pressure-relieving joints free of mortar and other rigid materials.
 2. Sealing expansion, control, and pressure-relieving joints is specified in Division 7 Section "Joint Sealants."
- G. Install embedded flashing and weep holes at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated.
1. Install metal drip edges beneath flashing at exterior face of wall. Stop flashing 1/2 inch back from outside face of wall and adhere flashing to top of metal drip edge.
 2. Install metal flashing termination beneath flashing at exterior face of wall. Stop flashing 1/2 inch back from outside face of wall and adhere flashing to top of metal flashing termination.
 3. Cut flashing flush with face of wall after masonry wall construction is completed.
- H. Place weep holes and vents in joints where moisture may accumulate, including at base of cavity walls, above shelf angles, and at flashing.
1. Use wicking material to form weep holes above flashing in stone sills. Turn wicking down at lip of sill to be as inconspicuous as possible.
 2. Space weep holes 16 inches o.c.
 3. Space weep holes formed from [**plastic tubing**] [**or**] [**wicking material**] 16 inches o.c.
 4. In cavities, place pea gravel to a height of 2 inches above top of flashing embedded in the wall, as masonry construction progresses.
 5. Place cavity drainage material immediately above flashing in cavities.
- I. Trim wicking material used in weep holes flush with outside face of wall after mortar has set.

3.4 CONSTRUCTION TOLERANCES

- A. Measure variation from level, plumb, and position shown in plan as variation of the average plane of the face of each stone from level, plumb, or dimensioned plane.

3.5 INSTALLATION OF ANCHORED STONE VENEER ASSEMBLIES

- A. Space veneer anchors not more than 18 inches o.c. vertically and 32 inches o.c. horizontally, with not less than 1 veneer anchor per 2.67 sq. ft. of wall area. Install additional veneer anchors within 12 inches of openings, sealant joints, and perimeter at intervals not exceeding 12 inches
- B. Set stone in full bed of mortar with full head joints, unless otherwise indicated. Build veneer anchors into mortar joints as stone is set.

- C. Provide 1-inch air space between stone veneer assemblies and backup construction, unless otherwise indicated. Keep air space free of mortar droppings and debris.
- D. Rake out joints for pointing with mortar so that mortar is not visible and the walls appear to be "stacked stone" in character.
- E. Install lath over unit masonry and concrete to comply with ASTM C 1063.
- F. Install scratch coat over metal lath 3/8 inch thick to comply with ASTM C 926.
- G. Coat backs of stone units and face of masonry backup with cement-paste bond coat, then butter both surfaces with setting mortar. Use sufficient setting mortar so a slight excess will be forced out the edges of stone units as they are set. Tap units into place, completely filling space between units and masonry backup.

3.6 POINTING

- A. Prepare stone-joint surfaces for pointing with mortar by removing dust and mortar particles. Where setting mortar was removed to depths greater than surrounding areas, apply pointing mortar in layers not more than 3/8 inch deep until a uniform depth is formed.
- B. Point stone joints by placing and compacting pointing mortar in layers not more than 3/8 inch deep. Compact each layer thoroughly and allow to become thumbprint hard before applying next layer.
- C. Tool joints, when pointing mortar is thumbprint hard, with a smooth jointing tool to produce the following joint profile:
 - 1. Joint Profile: recessed so mortar is not visible and the walls appear "as stacked fieldstone in character"

3.7 ADJUSTING AND CLEANING

- A. Remove and replace stone veneer assemblies of the following description:
 - 1. Broken, chipped, stained, or otherwise damaged stone. Stone may be repaired if methods and results are approved by Architect.
 - 2. Defective joints.
 - 3. Stone veneer assemblies not matching approved samples and mockups.
 - 4. Stone veneer assemblies not complying with other requirements indicated.
- B. Replace in a manner that results in stone veneer assemblies' matching approved samples and mockups, complying with other requirements, and showing no evidence of replacement.

- C. In-Progress Cleaning: Clean stone veneer assemblies as work progresses. Remove mortar fins and smears before tooling joints.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean stone veneer assemblies as follows:
 - 1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
 - 2. Test cleaning methods on mockup; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before cleaning stone veneer assemblies.
 - 3. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.
 - 4. Wet wall surfaces with water before applying cleaner; remove cleaner promptly by rinsing thoroughly with clear water.
 - 5. Clean stone veneer assemblies with proprietary acidic cleaner applied according to manufacturer's written instructions. Contractor to prevent mortar spill from occurring on all ground plan (pavers) or (landscaped) services.

3.8 EXCESS MATERIALS AND WASTE

- A. Excess Stone: must be disposed of off-site according to all Local, State and Federal guidelines.

END OF SECTION 04860

SECTION 07 21 13

THERMAL INSULATION

PART 1 - GENERAL

1.1 DESCRIPTION:

- A. This section specifies thermal and acoustical insulation for buildings.
- B. Acoustical insulation is identified by thickness and words "Acoustical Insulation".

1.2 RELATED WORK

- B. Insulation for insulated wall panels: Section 07 40 00, ROOFING AND SIDING PANELS.
- C. Insulation in connection with roofing and waterproofing: Section 07 22 00, ROOF AND DECK INSULATION.
- E. Safing insulation: Section 07 84 00, FIRESTOPPING.

1.3 SUBMITTALS:

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES .
- B. Manufacturer's Literature and Data:
 - 1. Insulation, each type used
 - 2. Adhesive, each type used.
 - 3. Tape
- C. Certificates: Stating the type, thickness and "R" value (thermal resistance) of the insulation to be installed.

1.4 STORAGE AND HANDLING:

- A. Store insulation materials in weathertight enclosure.
- B. Protect insulation from damage from handling, weather and construction operations before, during, and after installation.

1.5 APPLICABLE PUBLICATIONS:

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by basic designation only.
- B. American Society for Testing and Materials (ASTM):
 - C270-10.....Mortar for Unit Masonry
 - C516-08.....Vermiculite Loose Fill Thermal Insulation
 - C549-06.....Perlite Loose Fill Insulation
 - C552-07.....Cellular Glass Thermal Insulation.

C553-08.....Mineral Fiber Blanket Thermal Insulation for
Commercial and Industrial Applications
C578-10.....Rigid, Cellular Polystyrene Thermal Insulation
C591-09.....Unfaced Preformed Rigid Cellular
Polyisocynurate Thermal Insulation
C612-10.....Mineral Fiber Block and Board Thermal
Insulation
C665-06.....Mineral Fiber Blanket Thermal Insulation for
Light Frame Construction and Manufactured
Housing
C728-05 (R2010).....Perlite Thermal Insulation Board
C954-10.....Steel Drill Screws for the Application of
Gypsum Panel Products or Metal Plaster Base to
Steel Studs From 0.033 (0.84 mm) inch to 0.112
inch (2.84 mm) in thickness
C1002-07.....Steel Self-Piercing Tapping Screws for the
Application of Gypsum Panel Products or Metal
Plaster Bases to Wood Studs or Steel Studs
D312-00(R2006).....Asphalt Used in Roofing
E84-10.....Surface Burning Characteristics of Building
Materials
F1667-11.....Driven Fasteners: Nails, Spikes and Staples.

PART 2 - PRODUCTS

2.1 INSULATION - GENERAL:

- A. Where thermal resistance ("R" value) is specified or shown for insulation, the thickness shown on the drawings is nominal. Use only insulation with actual thickness that is not less than that required to provide the thermal resistance specified.
- B. Where "R" value is not specified for insulation, use the thickness shown on the drawings.
- C. Where more than one type of insulation is specified, the type of insulation for each use is optional, except use only one type of insulation in any particular area.
- D. Insulation Products shall comply with following minimum content standards for recovered materials:

Material Type	Percent by Weight
Perlite composite board	23 percent post consumer recovered paper
Polyisocyanurate/polyurethane	
Rigid foam	9 percent recovered material
Foam-in-place	5 percent recovered material
Glass fiber reinforced	6 percent recovered material
Phenolic rigid foam	5 percent recovered material
Rock wool material	75 percent recovered material

The minimum-content standards are based on the weight (not the volume) of the material in the insulating core only.

2.3 PERIMETER INSULATION IN CONTACT WITH SOIL:

- A. Polystyrene Board: ASTM C578, Type IV, V, VI, VII, or IX where covered by soil or concrete.
- B. Cellular Glass Block: ASTM C552, Type I or IV.

2.4 EXTERIOR FRAMING OR FURRING INSULATION:

- A. Batt or Blanket: foil scrim, commercial grade.
- B. Mineral Fiber: ASTM C665, Type II, Class C, Category I where framing is faced with gypsum board.
- C. Mineral Fiber: ASTM C665, Type III, Class A where framing is not faced with gypsum board.

2.5 ACOUSTICAL INSULATION:

- A. Mineral Fiber boards: ASTM C553, Type II, flexible, or Type III, semi-rigid (4.5 pound nominal density).
- B. Mineral Fiber Batt or Blankets: ASTM C665. Maximum flame spread of 25 and smoke development of 450 when tested in accordance with ASTM E84.
- C. Thickness as shown; of widths and lengths to fit tight against framing.

2.6 SOUND DEADENING BOARD:

- A. Mineral Fiber Board: ASTM C612, Type IB, 13 mm (1/2 inch thick).
- B. Perlite Board: ASTM C728, 13 mm (1/2 inch thick).

2.7 RIGID INSULATION:

- A. On the inside face of exterior walls, spandrel beams, floors, bottom of slabs, and where shown.
- B. Mineral Fiber Board: ASTM C612, Type IB or 2.
- C. Perlite Board: ASTM C728.

D. Cellular Glass Block: ASTM C552, Type I.

2.7.1 RIGID INSULATION GARDEN ROOF

~~A. loose laid over Fluid applied roofing membrane and root barrier.~~

~~B. Thickness as indicated~~

~~C. Extruded Polystyrene insulation: ASTM C518, ASTM C612, ASTM C272~~

See section 075556 PROTECTED HOT FLUID APPLIED RUBBERIZED ASPHALT ROOFING
SYSTEM 2.02 PRODUCTS MATERIALS, Insulation

2.7.2 RIGID INSULATION TPO ROOF

~~A. Mechanically attached to roof~~

~~B. R-22-3"~~

~~C. Polyisocyanurate/polyurethane Insulation board: ASTM C1289-04,~~

See section 072200 ROOF AND DECK INSULATION. 2.2 PRODUCTS, ROOF AND DECK
INSULATION

2.8 MASONRY FILL INSULATION:

A. Vermiculite Insulation: ASTM C516, Type II.

B. Perlite Insulation: ASTM C549, Type IV.

2.9 FASTENERS:

A. Staples or Nails: ASTM F1667, zinc-coated, size and type best suited
for purpose.

B. Screws: ASTM C954 or C1002, size and length best suited for purpose
with washer not less than 50 mm (two inches) in diameter.

C. Impaling Pins: Steel pins with head not less than 50 mm (two inches) in
diameter with adhesive for anchorage to substrate. Provide impaling
pins of length to extend beyond insulation and retain cap washer when
washer is placed on the pin.

2.10 ADHESIVE:

A. As recommended by the manufacturer of the insulation.

B. Asphalt: ASTM D312, Type III or IV.

C. Mortar: ASTM C270, Type 0.

2.11 TAPE:

A. Pressure sensitive adhesive on one face.

B. Perm rating of not more than 0.50.

PART 3 - EXECUTION

3.1 INSTALLATION - GENERAL

A. Install insulation with the vapor barrier facing the heated side,
unless specified otherwise.

- B. Install rigid insulating units with joints close and flush, in regular courses and with cross joints broken.
- C. Install batt or blanket insulation with tight joints and filling framing void completely. Seal cuts, tears, and unlapped joints with tape.
- D. Fit insulation tight against adjoining construction and penetrations, unless specified otherwise.

3.2 MASONRY CAVITY WALLS:

- A. Mount insulation on exterior faces of inner wythes of masonry cavity walls and brick faced concrete walls. Fill joints with same material used for bonding.
- B. Bond polystyrene board to surfaces with adhesive or Portland cement mortar mixed and applied in accordance with recommendations of insulation manufacturer.
- C. Bond mineral fiberboard, polyurethane or polyisocyanurate board, and perlite board to surfaces with adhesive as recommended by insulation manufacturer.
- D. Bond cellular glass insulation to surfaces with hot asphalt or adhesive cement.

3.3 PERIMETER INSULATION:

- A. Vertical insulation:
 - 1. Fill joints of insulation with same material used for bonding.
 - 2. Bond polystyrene board to surfaces with adhesive or Portland cement mortar mixed and applied in accordance with recommendations of insulation manufacturer.
 - 3. Bond cellular glass insulation to surfaces with hot asphalt or adhesive cement.
- B. Horizontal insulation under concrete floor slab:
 - 1. Lay insulation boards and blocks horizontally on level, compacted and drained fill.
 - 2. Extend insulation from foundation walls towards center of building not less than 600 mm (24 inches) or as shown.

3.4 EXTERIOR FRAMING OR FURRING BLANKET INSULATION:

- A. Pack insulation around door frames and windows and in building expansion joints, door soffits and other voids. Pack behind outlets around pipes, ducts, and services encased in walls. Open voids are not permitted. Hold insulation in place with pressure sensitive tape.

- B. Lap vapor retarder flanges together over face of framing for continuous surface. Seal all penetrations through the insulation.
- C. Fasten blanket insulation between metal studs or framing and exterior wall furring by continuous pressure sensitive tape along flanged edges.
- D. Fasten blanket insulation between wood studs or framing with nails or staples through flanged edges on face of stud. Space fastenings not more than 150 mm (six inches) apart.
- E. Roof Rafter Insulation or Floor Joist Insulation: Place mineral fiber blankets between framing to provide not less than a 50 mm (two inch) air space between insulation and roof sheathing or subfloor.
- F. Ceiling Insulation and Soffit Insulation:
 - 1. Fasten blanket insulation between wood framing or joist with nails or staples through flanged edges of insulation.
 - 2. At metal framing or ceilings suspension systems, install blanket insulation above suspended ceilings or metal framing at right angles to the main runners or framing. Tape insulation tightly together so no gaps occur and metal framing members are covered by insulation.
 - 3. In areas where suspended ceilings adjoin areas without suspended ceilings, install either blanket, batt, or mineral fiberboard extending from the suspended ceiling to underside of deck or slab above. Secure in place to prevent collapse or separation of hung blanket, batt, or board insulation and maintain in vertical position. Secure blanket or batt with continuous cleats to structure above.

3.5 RIGID INSULATION ON SURFACE OF EXTERIOR WALLS, FLOORS, AND UNDERSIDE OF FLOORS:

- A. On the interior face of solid masonry and concrete walls, beams, beam soffits, underside of floors, and to the face of studs for interior wall finish where shown.
- B. Bond to solid vertical surfaces with adhesive as recommended by insulation manufacturer. Fill joints with adhesive cement.
- C. Use impaling pins for attachment to underside of horizontal surfaces. Space fastenings as required to hold insulation in place and prevent sagging.
- D. Fasten board insulation to face of studs with screws, nails or staples. Space fastenings not more than 300 mm (12 inches) apart. Stagger fasteners at joints of boards. Install at each corner.
- E. Floor insulation:

1. Bond insulation to concrete floors in attic by coating surfaces with hot steep asphalt applied at rate of not less than 11.5 Kg per m² (25 lbs/100 sq. ft.), and firmly bed insulation therein.
2. When applied in more than one layer, bed succeeding layers in hot steep asphalt applied at the rate of not less than 11.5 Kg per m² per m² lbs/100 sq. ft.).
3. Contractors option: Insulation may be installed with nonflammable adhesive in accordance with the manufacturer's printed instructions when a separate vapor retarder is used.

3.6 MASONRY FILL INSULATION:

- A. Pour fill insulation in // cavity // voids of masonry units // from tops of walls, or from sill where windows or other openings occur.
- B. Pour in lifts of not more than 6 m (20 feet).

3.7 ACOUSTICAL INSULATION:

- A. Fasten blanket insulation between metal studs and wall furring with continuous pressure sensitive tape along edges or adhesive.
- B. Pack insulation around door frames and windows and in cracks, expansion joints, control joints, door soffits and other voids. Pack behind outlets, around pipes, ducts, and services encased in wall or partition. Hold insulation in place with pressure sensitive tape or adhesive.
- C. Do not compress insulation below required thickness except where embedded items prevent required thickness.
- D. Where acoustical insulation is installed above suspended ceilings install blanket at right angles to the main runners or framing. Extend insulation over wall insulation systems not extending to structure above.
- E. Where semirigid insulation is used which is not full thickness of cavity, adhere to one side of cavity maintaining continuity of insulation and covering penetrations or embedments in insulation.
- F. Where sound deadening board is shown, secure // with adhesive to masonry or concrete walls // and // with screws to metal or wood framing //. Secure sufficiently in place until subsequent cover is installed. Seal all cracks with caulking.

3.7.1 RIGID INSULATION GARDEN ROOF

See section 075600 for installation requirements

3.7.2 RIGID INSULATION TPO ROOF

See section 075423 for installation requirements

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SECTION 11 13 13
FULL DOCK-LENGTH LAMINATED DOCK BUMPERS AND COLUMN PROTECTION.

PART 1 - GENERAL

1.1 DESCRIPTION:

This section specifies the furnishing, and installation of dock bumpers and column guards.

1.2 RELATED WORK:

- A. Section 03 45 00, PRECAST ARCHITECTURAL CONCRETE
- B. Section 08 36 13 SECTIONAL ACOUSTICAL DOORS
- C. Section 07 81 00 APPLIED FIREPROOFING
- D. Section 05 12 00 STRUCTURAL STEEL FRAMING

1.3 SUBMITTALS:

- A. Submit the following:
- B. Shop Drawings:
 - 1. Sufficient information, clearly presented, shall be included to determine compliance with drawings and specifications.

PART 2 - PRODUCTS

2.1 DOCK BUMPERS:

- A. Dock bumpers are to be constructed of recycled material. Resilient rubber material of bumpers shall be recycled and sourced from truck tires cut to uniform size pads and punched to receive $\frac{3}{4}$ " supporting rods. Bumpers to be compressed under approximately 1,500 lbs of pressure, steel angles secured by $\frac{1}{4}$ " steel rods passing through tire sections at 90 degrees to dock.
- B. The anchor leg of the angle extends a minimum of 3" beyond the rubber surface at either end and contains 13/16" min anchor bolt holes as required (anchor bolts supplied separately). All steel plates supports and fasteners to be galvanized
- C. All dock bumpers must be either 6" thick (projection from dock), and closed with two 3" x 3" x 1/4" structural angles under approximately 1,500 lbs of pressure. These angles are to be welded to 3/4" rods at one end and closed with threaded rod and nut at the other end.
- D. The anchor leg of angle extends a minimum of 3" beyond the rubber surface at either end and contains two or three 13/16" anchor bolt holes as required.

2.2 COLUMN PROTECTION:

- A. Column protection are to be blow molded high density polyethylene in a clam shell configuration. Polyethylene to contain UV inhibitors for weather and chemical resistance. Guards shall be tested for fork truck impacts up to an 8,500 lb at 5 mph. Protector heights are to be 42 inches high. Color to be safety yellow. Installation straps are to be black nylon.

PART 3 - EXECUTION

3.1 INSTALLATION:

1. Furnish and install extra-length laminated rubber dock bumpers as manufactured per manufacturer's instructions. Resilient rubber material of bumpers shall be rubberized-fabric truck tires cut to uniform size pads either 6" x 10". Pads shall be punched to receive 3/4" supporting rods.
2. Furnish and install column guards per manufacturer's instructions. Column guards are to be coordinated to be sized to accommodate fire protective coatings on structural columns

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SECTION 12 31 00
MANUFACTURED METAL CASEWORK

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section specifies metal casework and related accessories, including base cabinets, wall cabinets, and full height cabinets.
- B. Items specified in this section:
 - 1. Metal casework of the following types:
 - a. Base Cabinet, Door and Drawer, Metal..
 - b. Base Cabinet, Four Drawer, Metal.
 - c. Base Cabinet, Accessible Sink Apron, Metal.
 - d. Wall Cabinet, Metal, 5B (SD123100-01).
 - e. Wall Cabinet, Metal, 22W.

1.2 RELATED WORK

- A. Color of casework finish: Section 09 06 00, SCHEDULE FOR FINISHES.
- B. Wall Mounted Stainless Steel Shelves: Section 10 28 00, TOILET, BATH, AND LAUNDRY ACCESSORIES.
- B. Epoxy Resin Countertops, Sidesplashes, and Backsplashes: Section 12 36 00, COUNTERTOPS.
- B. Electrical Components: Division 26, ELECTRICAL.

1.3 QUALITY ASSURANCE

- A. Approval by Contracting Officer of proposed manufacturer, or suppliers, will be based upon submission by Contractor certification that, manufacturer regularly and presently manufactures casework specified as one of their principal products.
- B. Installer has technical qualifications, experience, trained personnel, and facilities to install specified items.
- C. Furnish supervision of installation at construction site by a qualified technician regularly employed by casework installer.

1.4 SUBMITTALS

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Certificates:
 - 1. Manufacturer's Certificate of qualifications specified and finish on casework.
 - 2. Contractor's Certificate of installer's qualifications specified.

C. Manufacturer's Literature and Data:

1. Brochures showing name and address of manufacturer, and catalog or model number of each item incorporated into the work.
2. Manufacturer's illustration and detailed description.
3. List of deviations from contract specifications.
4. Locks, each kind

D. Shop Drawings (1/2 Full Scale):

1. Showing details of casework construction, including kinds of materials and finish, hardware, accessories and relation to finish of adjacent construction, including specially fabricated items or components.
2. Fastenings and method of installation.
3. Location of service connections and access.

E. Samples:

1. Metal plate, 150 mm (six inch) square, showing chemical resistant finish, in each color.
2. One complete casework assembly, including cabinet(s) with drawers and cupboard.
3. 4. Cabinets for subsequent installation may be submitted for above requirements.

1.5 APPLICABLE PUBLICATIONS

A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in the text by basic designation only.

B. American Society for Testing and Materials (ASTM):

A36/A36M-08.....Carbon Structural Steel

A167-99(R 2009).....Stainless and Heat-Resisting Chromium Steel
Plate Sheet and Strip

A283/A283M-03(R 2007)...Low and Intermediate Tensile Strength Carbon
Steel Plates

A568/A568M-09.....Steel, Sheet, Carbon and High-Strength, Low-
Alloy Hot-Rolled and Cold-Rolled, General
Requirements

A794/A794M-09.....Standard Specification for Commercial Steel
(CS), Sheet, Carbon (0.16% Maximum to 0.25%
Maximum) Cold Rolled

B456-03(R2009).....Electrodeposited Coatings of Copper Plus Nickel
Plus Chromium and Nickel Plus Chromium

C1036-06.....Flat Glass

- D. Builders Hardware Manufacturers Association (BHMA):
 - A156.1-06.....Butts and Hinges
 - A156.9-10.....Cabinet Hardware
 - A156.5-10.....Auxiliary Locks and Associated Products
 - A156.11-10.....Cabinet Locks
 - A156.16-02.....Auxiliary Hardware
- E. American Welding Society (AWS):
 - D1.1-10.....Structural Welding Code Steel
 - D1.3-08.....Structural Welding Code Sheet Steel
- F. National Association of Architectural Metal Manufacturers (NAAMM):
 - AMP 500-505-06 Series...Metal Finishes Manual
- G. U.S. Department of Commerce, Product Standard (PS):
 - PS 1-95.....Construction and Industrial Plywood
- H. Federal Specifications (Fed. Spec.):
 - FF-N-836D.....Nut, Square, Hexagon Cap, Slotted, Castle
Knurled, Welding and Single Ball Seat
 - A-A-55615.....Shield, Expansion; Nail Expansion (Wood Screw
and Lag Bolt Self-Threading Anchors)

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Sheet Steel:
 - 1. ASTM A794, cold rolled, Class 1 finish, stretcher leveled.
 - 2. Other types of cold rolled steel meeting requirements of ASTM A568 may be used for concealed parts.
- B. Structural Steel: ASTM A283 or ASTM A36.
- C. Stainless Steel: ASTM A167, Type 302B.
- H. Fasteners:
 - 1. Exposed to view, chrome plated steel or stainless steel, or finished to match adjacent surface.
 - 2. Use round head or countersunk fasteners where exposed in cabinets.
 - 3. Expansion Bolts: Fed Spec. A-A-55615. Do not use lead or plastic shields.
 - 4. Nuts: Fed Spec FF-N-836. Type III, Style 15 where exposed.
 - 5. Sex Bolts: Capable of supporting twice the load.

2.2 MANUFACTURED PRODUCTS

- A. When two or more units are required, use products of one manufacturer.
- B. Manufacturer of equipment assemblies, which include components made by other, shall assume complete responsibility for the final assembled unit.

C. Constituent parts which are alike, use products of a single manufacturer.

2.3 CASEWORK FABRICATION

A. General:

1. Welding: Comply with AWS Standards.
2. Reinforce with angles, channels, and gussets to support intended loads, notch tightly, fit and weld joints.
3. Constructed of sheet steel, except where reinforcing required.

B. Minimum Steel Thickness:

0.89 mm (0.035 inch) (20 gage)	Drawer fronts, backs, bodies, closure plates or scribe and filler strips less than 75 mm (three inches) wide, sloping top, shelf reinforcement channel and shelves. Toe space or casework soffits and ceilings under sloping tops.
1.20 mm (0.047 inch) (18 gage)	Base pedestals, casework top sides, back, and bottom panels, closure scribe and filler strips 75 mm (three inches) or more. Reinforcement for drawers with locks. Tables legs, spreaders and stretchers, when fabricated of cold rolled tubing. Metal for desks; except legs and aprons. Door exterior and interior panels, flush or glazed. Cross rails of base units. Front bottom rails, back bottom rails; rails may be 1.49 mm (0.059 inch) (16 gage) thick. Uprights or posts. Top corner gussets.
1.49 mm (0.059 inch) (16 gage)	Aprons, apron division, reinforcing gussets, table legs, desk legs and aprons, spreaders and stretchers when formed without welding. Toe base gussets, drawer slides, and other metal work. Front top rails and back rails except top back rails may be 1.2 mm (0.047 inch) (18 gage) thick.
1.88 mm (0.074 inch) (14 gage)	Drawer runners door tracks.
2.64 mm (0.104 inch) (12 gage)	Base unit bottom corner gussets and leg sockets.
3 mm (0.12 inch) (11 gage)	Reinforcement for hinge reinforcement inside doors and cabinets.

C. Casework Construction:

1. Welded assembly.
2. Fabricate with enclosed uprights or posts full height or width at front, include sides, backs, bottoms, soffits, ceilings under sloping tops, headers and rail, assembled to form an integral unit.

3. Form sides to make rabbeted stile 19 to 28 mm (3/4 to 1-1/8 inch) wide, closed by channel containing shelf adjustment slots.
 4. Make bottom of walls units flush, double panel construction.
 5. Make top and cross rails of "U" shaped channel.
 6. Provide enclosed backs and bottoms in cabinets, including drawer units.
 7. Provide finish panel on exposed cabinet backs.
 8. Do not use screws and bolts in construction or assembly of casework, except to secure hardware, applied door stops, accessories, removable panels and where casework is required to fastened end to end or back to back.
 9. Fabricate casework with finished end panels.
 10. Close flush exposed soffits of wall hung shelving, knee spaces in counters, and toe spaces at bases.
 11. In base units with sinks provide one piece, lowered backs.
 12. In base units with doors provide removable backs.
 13. Provide built-in raceways or tubular or channel shaped members of casework for installation of wiring and electric work. Mount junction boxes on rear of cabinets, Electric work is specified in electrical sections of specifications.
 14. Provide reinforcing for hardware.
 15. Size Dimensions:
 - a. Used dimensions shown or specified within tolerances specified.
 - b. Tolerance:
 - 1) Depth: 325 mm (13 inches) in lieu of 300 mm (12 inches), 450 mm (18 inches) in lieu of 400 mm (16 inches), except wall hung units above counter. 525 mm (21 inches) to 600 mm (24 inches) in lieu of 550 mm (22 inches).
 - 2) Width: Minus 25 mm (one inch).
 - 3) Height: 25 mm (one inch) plus or minus for wall hung cabinets and counter mounted cabinets, excluding sloping tops. 25 mm (one inch) plus for floor standing cabinets, excluding base and sloping tops. Full height cabinets shown back to back same height.
 - 4) Manufacturer's tolerance for the same length, depth or height: Not to exceed 1.58 mm (0.0625 inches).
- D. Base Pedestals:
1. Provide adjustable leveling bolts accessible through stainless steel plugs, or notch in the base concealed when resilient base is applied.

2. Except where flush metal base is shown, provide toe space at front recessed 75 mm (3 inches).

E. Doors:

1. Hollow metal type, flush and glazed doors not less than 16 mm (5/8 inch) thick.
2. Fabricate flush metal doors of two panels formed into pans with corners welded and ground smooth. Provide flush doors with a sound deadening core.
4. Provide sheet steel hinge reinforcement inside doors.
5. Doors removable without use of tools except where equipped with locks.

F. Drawers:

1. Drawer fronts flush hollow metal type not less than 16 mm (5/8 inch) thick with sound deadening core. Fabricate of two panels formed into pans. Weld and grind smooth corners of drawer fronts.
2. Form bodies from one piece of steel, weld to drawer front.
3. Provide reinforcement for locks and provide rubber bumpers at both sides of drawer head to cushion closing.
4. Equip with roller suspension guides.

G. Sloping Tops:

1. Provide sloping tops for casework.
2. Provide exposed ends of sloping tops with flush closures.
3. Fasten sloping tops with sheet metal screws inserted from cabinet interior; space fastener as recommended by manufacturer.

H. Shelves:

1. Capable of supporting an evenly distributed minimum load of 122 kg/m² (twenty-five pounds per square foot) without visible distortion.
2. Flange shelves down 19 mm (3/4 inch) on edges, with front and bearing edges flanged back 13 mm (1/2 inch).
3. For shelves over 1050 mm (42 inches) in length and over 300 mm (12 inches) in depth install 38 mm by 13 mm by 0.9 mm (1-1/2 x 1/2 x 0.0359 inch) thick sheet steel hat channel reinforcement welded to underside midway between front and back and extending full length of shelf.
4. Weld shelves to metal back and ends unless shown adjustable.
5. Provide means of positive locking shelf in position, and to permit adjustment without use of tools.

I. Undercounter Table and Bench Frames:

1. Using welded construction.

2. Open frame type with aprons and legs when required.

3. Aprons:

- a. Channels shaped welded at corners, with leg sockets and reinforcing triangular corner gussets welded in corners.
- b. Pierce sockets to receive leg bolts and notch gussets to receive legs.
- c. Upper flange perforated or slotted to receive screws at 200 mm (8 inch) centers, and back channels when installed against wall. Size slots for 6 mm (1/4 inch) anchor bolts.
- d. Pierce aprons to receive drawer formation, rail at top of drawer opening. Install channel shaped apron division welded at ends, 762 mm 30 inches apart to front and back aprons, or at each side of drawer.
- e. Fabricate metal components from sheet steel.
 - 1) Use 1.5 mm (0.0598 inch) thick sheet for gussets and channel aprons.
 - 2) Use 1.2 mm (0.0478 inch) thick sheet for other items.
- f. At knee space, provide exposed metal sides and metal closure plate for soffit. Where shown at knee space, provide exposed metal back secured with continuous angle closures at both side.

4. Legs:

- a. Cold rolled tubing or 1.5 mm (0.0598 inch) formed steel.
- b. Leveling-anchoring device at floor.
- c. Stud bolt at top for attachment to leg socket.

5. Leg Braces:

- a. Tables and benches not anchored to walls.
- b. Brace back against front legs near bottom with steel angle, channel or tubular braces.
- c. Fasten braces together with steel straps.

6. Leg Shoes:

- a. Fit laboratory casework legs at bottom with either stainless steel, aluminum, or chromium plated brass shoes, not less than 25 mm (one inch) in height.
- b. Fit other legs with a movable molded vinyl shoe 100 mm (four inches) high and coved at bottom.

J. Closures and Filler Strips at Pipe Spaces:

- 1. Flat steel strips or plates.
- 2. Openings less than 200 mm (8 inches) wide: 1.2 mm (0.047 inch) thick.
- 3. Openings more than 200 mm (8 inches) wide 0.9 mm (0.359 inches) wide.

2.4 ACCESSORIES

A. Card or Label Holders for Shelves:

1. Fabricate of 0.6 mm (0.0239 inch) thick steel approximately 125 mm (five inches) long, or continuous where shown, having top and bottom edges bent over on face and welded to shelf.
2. Finish exposed surfaces in same color as shelf.

B. Labels Holders for Doors and Drawers:

1. Cast or wrought brass or aluminum, 50 mm (2 inch) by 88 mm (3-1/2 inch).
2. Fasten to casework as recommended by manufacturer.

2.5 HARDWARE

A. Factory installed.

B. Exposed hardware, except as specified otherwise, satin finished chromium plated brass or nickel plated brass or anodized aluminum.

SPEC WRITER NOTE: Verify locks are shown
on details for cabinets.

D. Cabinet Hardware: ANSI BHMA A156.9.

1. Door/Drawer Pulls: B02011.

- a. One for drawers up to 575 mm (23 inches) wide.
- b. Two for drawers over 575 mm (23 inches) wide.
- c. Sliding door flush pull, each door: B02201.

2. Door in seismic zones: B03352.

- a. Do not provide thumb latch on doors equipped with three point locking device.
- b. Use lever operated two point latching device on paired doors over 900 mm (36 inches) high if three point locking or latching device is not used.

3. Cabinet Door Catch:

- a. Install at bottom of wall cabinets, top of base cabinets and top and bottom of full height cabinet doors over 1200 mm (48 inches).
- b. Omit on doors with locks.

4. Drawer Slides:

- a. Use B05051 for drawers over 150 mm (6 inches) deep.
- b. Use B05052 for drawers 75 to 150 mm (3 to 6 inches) deep.
- c. Use B05053 for drawers less than 75 mm (3 inches) deep.

5. Butt Hinges:

- a. B01351, minimum 1.8 mm (0.072 inch) thick chrome plated steel leaves.
- b. Minimum 3.5 mm (0.139 inch) diameter stainless steel pins.

- c. Full mortise type, five knuckle design with 63 mm (2-1/2 inch) high leaves and hospital type tips.
- d. Two hinges per door except use three hinges on doors 1200 mm (48 inches) and more in height. Use stainless steel leaves for tilting bin doors.
- f. Do not weld hinges to doors or cabinets.
- 6. Pivot hinges: ANSI/BHMA A156.1 A875B.
- 7. Shelf Supports:
 - a. install in casework where adjustable shelves are noted.
 - b. Adjustable Shelf Standards: B04061 with shelf rest B04081.
 - c. Vertical Slotted Shelf Standard: B04102 with shelf brackets B04112 sized for shelf depth.
- 9. Auxiliary Hardware: ANSI A156.16.

2.6 METAL FINISHES

- A. Comply with NAAMM 500 series and as specified.
- B. Steel Cabinets including Closures and Filler Strips:
 - 1. Acid resisting finish except hardware and stainless steel.
 - 2. After fabrication of cabinet submerge in a degreasing bath, and thoroughly rinse to remove dirt and grease, and other foreign matter.
 - 3. Apply non-metallic phosphate coating, then finish with baked-on acid resisting enamel not less than one mil thick.
 - 4. Finish resistant to action of the following reagents when 10 drops (0.5 cm³) are applied to the surface and left open to the atmosphere for period of one hour.

Hydrochloric Acid 37 percent	Ethyl Alcohol
Phosphoric Acid 75 percent	Methylethyl Keytone
Sulfuric Acid 25 percent	Acetone
Glacial Acetic Acid	Ethyl Acetate
Sodium Hydroxide 10 percent	Ethyl Ether
Sodium Hydroxide (concentrated)	Carbon Tetrachloride
Ammonia Hydroxide (concentrated)	Xylene
Hydrogen Peroxide 5 percent	Phenol 85 Percent
Formaldehyde 37 percent	

- 5. Color of finish is specified in Section, INTERIOR/EXTERIOR FINISHES, MATERIALS, AND FINISH SCHEDULES.

- C. Brass:

- 1. U.S. Standard Finish No. 26 for hardware items.

2. Other brass items: ASTM B456, chromium plated finish meeting requirements for Service Condition SCI.

D. Aluminum: Chemically etched medium matte, clear anodic coating, Class II, Architectural, 0.4 mils thick.

E. Stainless Steel: Mechanical finish No. 4 on sheet except No. 7 on tubing.

2.7 ELECTRICAL FIXTURES

A. Comply with requirements of Division 26 - ELECTRICAL specifications for fixtures, receptacles, wiring and junction boxes required for fixtures and receptacles, included with casework.

B. Suitable for use with electrical system specified and shown.

C. Factory install in casework.

2.9 VL 33

A. Construct as shown.

B. Use pivot hinges on center shadow boards, secured to bottom and top of cabinet with bolts or screws.

2.10 SUSPENSION SYSTEM FOR FREESTANDING CASEWORK:

A. Suspension system shall provide for support of freestanding cabinets and countertops.

B. Suspension Frames: Fabricate of 32 mm (1-1/4 inch square) or 25 mm (1 inch) x 38 mm (1-1/2 inch) rectangular, 2.6 mm (0.104 inch) (12 gauge) steel tubing welded to form full rectangle. Provide integral, adjustable leveling device in steel leg with non marring foot cap.

C. Mounting channels and support frames shall allow for pipe chases and service channels when required.

D. Cabinets to have an 1.49 mm (0.059 inch) steel shaped form welded across entire width of back to engage continuous slot in wall mounting channel. Two fastening devices through case stile at front shall provide final positive location and locking of case in position.

E. All construction materials that are exposed shall be painted.

PART 3 - EXECUTION

3.1 COORDINATION

A. Before installing casework, verify wall and floor surfaces covered by casework have been finished.

B. Verify location and size of mechanical and electrical services as required.

C. Verify reinforcement of walls and partitions for support and anchorage of casework.

3.2 FASTENINGS AND ANCHORAGE

- A. Do not anchor to wood ground strips.
- B. Provide hat shape metal spacers where fasteners span gaps or spaces.
- C. Use 6 mm (1/4 inch) diameter toggle or expansion bolts, or other appropriate size and type fastening device for securing casework to walls or floor. Use expansion bolts shields having holding power beyond tensile and shear strength of bolt and breaking strength of bolt head.
- D. Use 6 mm (1/4 inch) diameter hex bolts for securing cabinets together.
- E. Use 6 mm (1/4 inch) by minimum 38 mm (1-1/2 inch) length lag bolt anchorage to wood blocking for concealed fasteners.
- F. Use not less than No. 12 or 14 wood screws with not less than 38 mm (1-1/2 inch) penetration into wood blocking.
- G. Space fastening devices 300 mm (12 inches) on center with minimum of three fasteners in 900 or 1200 mm (three or four foot) unit width.
- H. Anchor floor mounted cabinets with a minimum of four bolts through corner gussets. Anchor bolts may be combined with or separate from leveling device.
- I. Secure cabinets in alignment with hex bolts or other internal fastener devices removable from interior of cabinets without special tools. Do not use fastener devices which require removal of tops for access.
- J. Where units abut end to end anchor together at top and bottom of sides at front and back. Where units are back to back anchor backs together at corners with hex bolts placed inconspicuously inside casework.
- K. Where type, size, or spacing of fastenings is not shown or specified, show on shop drawings proposed fastenings and method of installation.

3.3 CLOSURES AND FILLER PLATES

- A. Close openings larger than 6 mm (1/4 inch) wide between cabinets and adjacent walls with flat, steel closure strips, scribed to required contours, or machined formed steel fillers with returns, and secured with sheet metal screws to tubular or channel members of units, or bolts where exposed on inside.
- B. Where ceilings interfere with installation of sloping tops, omit sloping tops and provide flat steel filler plates.
 - 1. Secure filler plates to casework top members, unless shown otherwise.
 - 2. Secure filler plates more than 150 mm (six inches) in width top edge to a continuous 25 by 25 mm (one by one inch) 0.889 mm thick steel formed steel angle with screws.
 - 3. Anchor angle to ceiling with toggle bolts.

- C. Install closure strips at exposed ends of pipe space and offset opening into concealed space.
- D. Paint closure strips and fillers with same finishes as cabinets.
- E. Caulk and seal laboratory furniture as specified in Section 07 92 00, JOINT SEALANTS.

3.4 CABINETS

- A. Install in available space; arranged for safe and convenient operation and maintenance.
- B. Align cabinets for flush joints except where shown otherwise.
- C. Install cabinets level with bottom of wall cabinets in alignment and tops of base cabinets aligned.
- D. Install corner cabinets with hinges on corner side with filler or spacers sufficient to allow opening of drawers.
- E. Plug Buttons:
 - 1. Install plug buttons in predrilled or prepunched perforations not used.
 - 2. Use chromium plate plug buttons or buttons finish to match adjacent surfaces.
- F. Cabinets 6D: Ground to nearest cold water pipe in accordance with NFPA, Underwriters Laboratories, Inc., or other nationally recognized laboratory approved ground specified system.

3.5 PROTECTION TO FIXTURES, MATERIALS, AND EQUIPMENT

- A. Tightly cover and protect cabinets against dirt, water chemical or mechanical injury.
- B. Thoroughly clean interior and exterior of cabinets, at completion of all work.

- - - E N D - - -

SECTION 32 31 13
CHAIN LINK FENCES AND GATES

PART 1 - GENERAL

1.1 DESCRIPTION

This work consists of all labor, materials, and equipment necessary for furnishing and installing chain link fence, gates and accessories in conformance with the lines, grades, and details as shown.

1.2 RELATED WORK

- A. Grounding: Section 26 05 26, GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS.
- B. Temporary Construction Fence: Section 01 00 00, GENERAL REQUIREMENTS.
- C. Rough Grading: Section 31 20 00, EARTH MOVING.
- D. Finish Grading: Section 32 90 00, PLANTING.
- E. Guard Booths: Section 13 34 19, METAL BUILDING SYSTEMS.

1.3 MANUFACTURER'S QUALIFICATIONS

Fence, gates, and accessories shall be products of manufacturers regularly engaged in manufacturing items of type specified.

1.4 SUBMITTALS

- A. In accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES, furnish the following:
 - 1. Manufacturer's Literature and Data: Chain link fencing, gates and all accessories.
 - 2. Manufacturer's Certificates: Zinc-coating complies with specifications.

1.5 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.
- B. American Society for Testing and Materials (ASTM):
 - A121-07.....Metallic Coated Carbon Steel Barbed Wire
 - A392-07.....Zinc-Coated Steel Chain-Link Fence Fabric
 - A491-11.....Aluminum Coated Steel Chain Link Fence Fabric
 - A817-07.....Metal-Coated Steel Wire for Chain-Link Fence Fabric and Marcellled Tension Wire

C94-12.....Ready-Mixed Concrete
F567-11a.....Installation of Chain-Link Fence
F626-08.....Fence Fittings
F668-11.....Polyvinyl Chloride (PVC) and Other Organic
Polymer-Coated Steel Chain Link Fence Material
F1043-11a.....Strength and Protective Coatings on Metal
Industrial Chain-Link Fence Framework
F1083-10.....Pipe, Steel, Hot-Dipped Zinc-Coated
(Galvanized) Welded, for Fence Structures.

C. Federal Specifications (Fed. Spec.):

FF-P-110J.....Padlock, Changeable Combination

PART 2 - PRODUCTS

2.1 GENERAL

Materials shall conform to the above referenced publications for ferrous metals, zinc-coated; and detailed specifications forming the various parts thereto; and other requirements specified herein. Zinc-coat metal members (including fabric, gates, posts, rails, hardware and other ferrous metal items) after fabrication shall be reasonably free of excessive roughness, blisters and sal-ammoniac spots.

2.2 CHAIN-LINK FABRIC

A. Steel Chain Link Fabric: 2 in. mesh, 72 in. high.

1. Polymer Coated Steel Fabric: the wire gauge specified for polymer-coated wire is that of the metallic coated steel core wire
 - a. Class 1 extruded
 - b. Class 2a extruded and adhered
 - c. Class 2b fused and adhered
 - d. Color: black

2.3 STEEL FENCE FRAMEWORK

A. Round steel pipe and rail: Group IA Heavy Industrial Fence Framework, schedule 40 galvanized pipe. Exterior zinc coating Type A, interior zinc coating Type A. High Strength 83000 Grade.

1. End, Corner, Pull post
2. Brace rails, top, bottom, and intermediate rails, 1.660 in. (42.2 mm) OD, 2.27 lb/ft
3. [3.38 kg/m]

- B. Polymer Coated Framework: Polymer coated framework shall have a PVC or polyolefin coating fused and adhered to the exterior zinc coating of the post or rail. PVC and polyolefin coatings shall have minimum thickness 10-mils (0.254 mm), polyester coating minimum thickness 3 mils (0.0076 mm. Color to match fabric black.

2.4 TENSION WIRE

- A. Metallic Coated Steel Marcellled Tension Wire: 7 gauge (0.177 in.) (4.50 mm) marcellled wire
1. Type I Aluminum-Coated (Aluminized) 0.40 oz/ft² (122 g/m²)
 2. Type II Zinc-Coated Class 4 - 1.2 oz/ft² (366 g/m²)
 3. Type II Zinc-Coated Class 5 - 2.0 oz/ft² (610 g/m²)
 4. Type III Zinc-5% Aluminum-Mischmetal Alloy Coated Steel Fabric
Class 1 - 0.6 oz/ft² (183 g/m²) Class 2 - 1.0 oz/ft² (305 g/m²)
- B. Polymer Coated Steel Tension Wire: 7 gauge (0.177 in.) (4.50 mm) wire. Wire gauge specified is the core wire gauge.
1. Class 1, extruded
 2. Class 2a, extruded and adhered
 3. Class 2b, fused and adhered,

2.5 FITTINGS

- A. Tension and Brace Bands: Galvanized pressed steel, minimum steel thickness of 12 gauge (0.105 in.) (2.67 mm), minimum width of 3/4 in. (19 mm) and minimum zinc coating of 1.20 oz/ft² (366 g/m²). Bands supplied with 5/16 in. (7.94 mm) or 3/8 in. (9.53 mm) galvanized steel carriage bolts.
- B. Terminal Post Caps, Line Post Loop Tops, Rail and Brace Ends, Boulevard Clamps, Rail Sleeves: Pressed steel galvanized after fabrication having a minimum zinc coating of 1.20 oz/ft² (366 g/m²).
- C. Truss Rod Assembly: 3/8 in. (9.53 mm) diameter steel truss rod with a pressed steel tightener, minimum zinc coating of 1.2 oz/ft² (366 g/m²), assembly capable of withstanding a tension of 2,000 lbs. (970 kg).
- D. Tension Bars: Galvanized steel one-piece length 2 in. (50 mm) less than the fabric height. Minimum zinc coating 1.2 oz. /ft² (366 g/m²).
1. Bars for 2 in. (50 mm) and 1 3/4 in. (44 mm) mesh shall have a minimum cross section of 3/16 in. (4.8 mm) by 3/4 in. (19 mm).
 2. Bars for 1 in. (25 mm) mesh shall have a cross section of 1/4 in. (6.4 mm) by 3/8 in. (9.5 mm).
 3. Bars for small mesh 3/8 in. (10 mm), 1/2 in. (13 mm) and 5/8 in. (16 mm) shall be attached (sandwiched) to the terminal post using a

galvanized steel strap having a minimum cross section of 2 in. (51 mm) by 3/16 in. (4.8 mm) with holes spaced 15 in. (381 mm) on center to accommodate 5/16 in. (7.9 mm) carriage bolts which are to be thru bolted thru the strap the mesh and thru the terminal post.

- E. Polymer Coated Color Fittings: Polymer coating minimum thickness 0.006 in. (0.152 mm) fused and adhered to zinc coated fittings and match color to fence system.

2.6 TIE WIRE AND HOG RINGS

Tie Wire and Hog Rings: Galvanized minimum zinc coating 1.20 oz/ft² (366 g/m²) 9 gauge (0.148) (3.76 mm) steel wire. Polymer coated; match the coating, class and color to that of the chain link fabric.

2.7 CONCRETE

Concrete for post footings shall have a 28-day compressive strength of 3,000 psi (25.8 MPa).

PART 3 EXECUTION

3.1 CLEARING FENCE LINE

Clearing: Surveying, clearing, grubbing, grading and removal of debris for the fence line or any required clear areas adjacent to the fence. Surveying, clearing, grubbing, grading and removal of debris for the fence line or any required clear areas adjacent to the fence is included in the earthwork contractor's contract. The contract drawings indicate the extent of the area to be cleared and grubbed.

3.2 FRAMEWORK INSTALLATION

- A. Posts: Posts shall be set plumb in concrete footings. Minimum footing depth, 24 in. (609.6 mm). Minimum footing diameter four times the largest cross section of the post up to 4.00" (101.6mm) O.D. and three times the largest cross section of post greater than 4.00" (101.6mm). O.D. Gate posts require larger footings. Top of post concrete footing to be // at grade // // 6 inches (152 mm) below grade // and crowned to shed water away from the post. Line posts installed at intervals not exceeding 10 ft. (3.05 m) on center.
- B. Top rail: When specified, install 21 ft. (6.4 m) lengths of rail continuous thru the line post or barb arm loop top. Splice rail using top rail sleeves minimum 6 in. (152 mm) long. The rail shall be secured to the terminal post by a brace band and rail end. Bottom rail or intermediate rail shall be field cut and secured to the line posts using boulevard bands or rail ends and brace bands. Fences 12 feet (3.66 m) high or higher require mid rail.

- C. Terminal posts: End, corner, pull and gate posts shall be braced and trussed for fence 6 ft. (1.8 m) and higher and for fences 5 ft. (1.5 m) in height not having a top rail.
- D. Tension wire: Shall be installed 4 in. (102 mm) up from the bottom of the fabric. Fences without top rail shall have a tension wire installed 4 in. (102 mm) down from the top of the fabric. Tension wire to be stretched taut, independently and prior to the fabric, between the terminal posts and secured to the terminal post using a brace band. Secure the tension wire to the chain link fabric with a 9 gauge hog rings 18 in. (457 mm) on center and to each line post with a tie wire. Install the top tension wire through the barb arm loop for fences having barbed wire and no top rail.

3.3 CHAIN LINK FABRIC INSTALLATION

- A. Chain Link Fabric: Install fabric to inside of the framework. Attach fabric to the terminal post by threading the tension bar through the fabric; secure the tension bar to the terminal post with tension bands and 5/16 in. (8 mm) carriage bolts spaced no greater than 12 inches (305 mm) on center. Small mesh fabric less than 1 in. (25 mm), attach to terminal post by sandwiching the mesh between the post and a vertical 2 in. wide (50 mm) by 3/16 in. (5 mm) steel bar using carriage bolts, thru bolted thru the bar, mesh and post spaced 15 in. (381 mm) on center. Chain link fabric to be stretched taut free of sag. Fabric to be secured to the line post with tie wires spaced no greater than 12 inches (305 mm) on center and to rail spaced no greater than 18 inches (457 mm) on center. Secure fabric to the tension wire with hog rings spaced no greater than 18 inches (457 mm) apart.
- B. Tie wire shall be wrapped around the post or rail and attached to the fabric wire picket on each side by twisting the tie wire around the fabric wire picket two full turns. Excess wire shall be cut off and bent over to prevent injury. The installed fabric shall have a ground clearance on no more than 2 inches (50 mm).

3.4 GATE INSTALLATION

- A. Swing Gates: Installation of swing gates and gateposts in compliance with ASTM F567. Direction of swing shall be inward. Gates shall be plumb in the closed position having a bottom clearance of 3 in. (76 mm) grade permitting. Hinge and latch offset opening space from the gate frame to the post shall be no greater than 3 in. (76 mm) in the closed position. Double gate drop bar receivers shall be set in a concrete

footing minimum 6 in. (152 mm) diameter 24 in. (610 mm) deep. Gate leaf holdbacks shall be installed for all double gates. Electrically operated gates and accessories must be manufactured and installed in compliance with manufacturer's recommendations.

- B. Horizontal Slide Gates: Installation varies by design and manufacturer, install according to manufacturer's instructions and in accordance with ASTM F567. Gates shall be plum in the closed position, installed to slide with an initial pull force no greater than 40 lbs. (18.14 kg). Double gate drop bar receivers to be installed in a concrete footing minimum 6 in. (152 mm) diameter, 24 in. (610 mm) deep. Ground clearance shall be 3 in. (76 mm), grade permitting. Electrically operated gates and accessories must be manufactured and installed in compliance with manufacturer's recommendations.

3.5 NUTS AND BOLTS

Bolts: Carriage bolts used for fittings shall be installed with the head on the secure side of the fence. All bolts shall be peened over to prevent removal of the nut.

3.6 ELECTRICAL GROUNDING

Grounding: Grounding, when required, shall be specified and included in Contract Section 33 79 00. A licensed electrical contractor shall install grounding.

3.7 CLEAN UP

Clean Up: The area of the fence line shall be left neat and free of any debris caused by the installation of the fence.

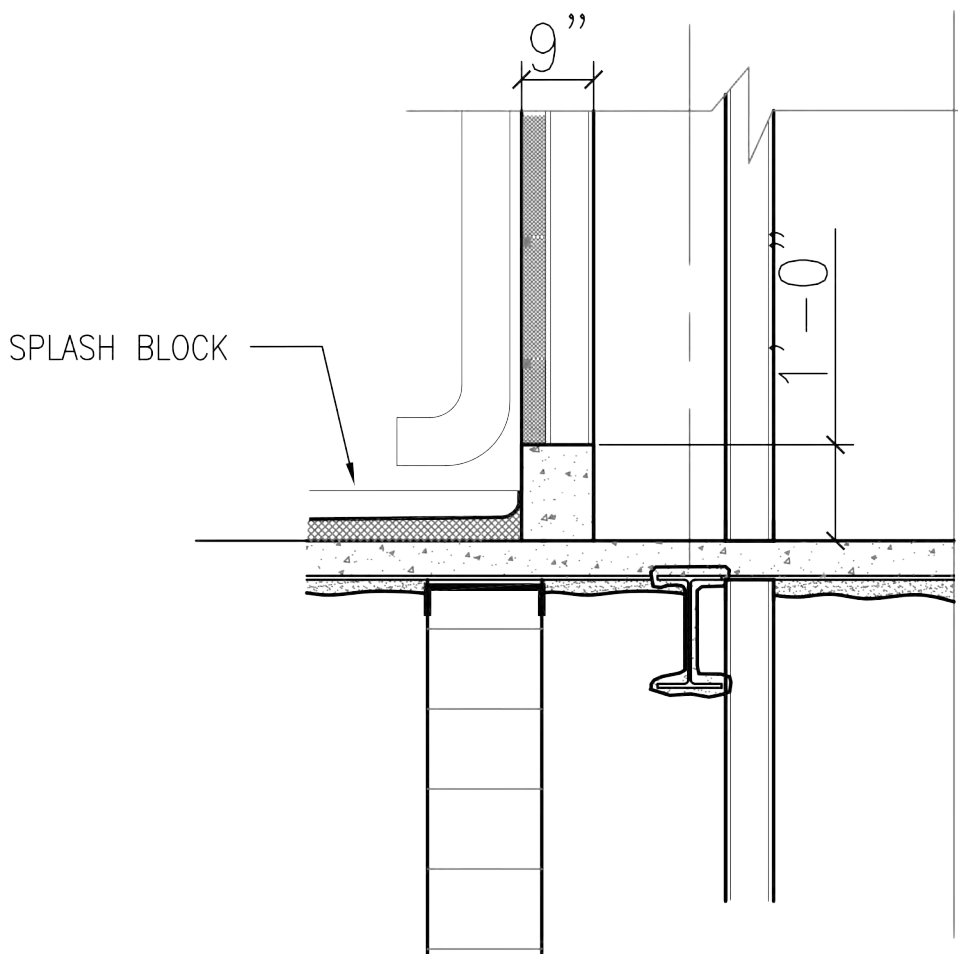
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and Facilities
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Veterans Affairs

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Drawing Reference

AS-402

Dwg.

SK-01

ADD01



1000 Abernathy Road N.E., Suite 900
 400 Northpark Town Center
 Atlanta, Georgia 30328
 Tel (678) 808-8800

URS Project: 15290200

Project: 508-13-400 VA701-13-R-0054
 ATLANTA VA MEDICAL CENTER
 COMBINED HEAT AND POWER (CHP) AND NEW
 STEAM GENERATION SYSTEM, DECATUR, GA

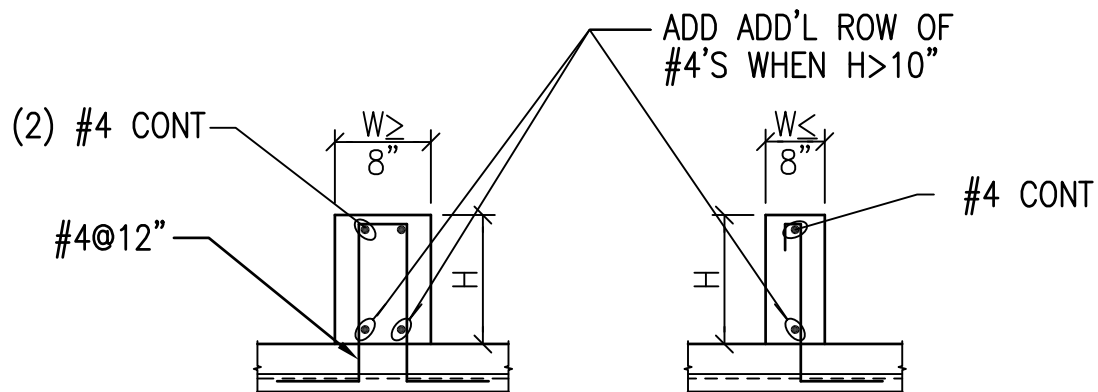
Date
 25 JULY 2014

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 and Facilities
 Management





NOTE: SEE ARCH DWGS FOR LOCATION

13

TYPICAL CURB DETAILS

SCALE: NTS

Drawing Reference

SS-603

Dwg.

SK-02 ADD01

URS

1000 Abernathy Road NE, Suite 600
400 Northpark Town Center
Atlanta, Georgia 30328
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URS Project: 15290200

Project: 508-13-400 VA701-13-R-0054

ATLANTA VA MEDICAL CENTER
COMBINED HEAT AND POWER (CHP) AND NEW
STEAM GENERATION SYSTEM, DECATUR, GA

Date

25 JULY 2014

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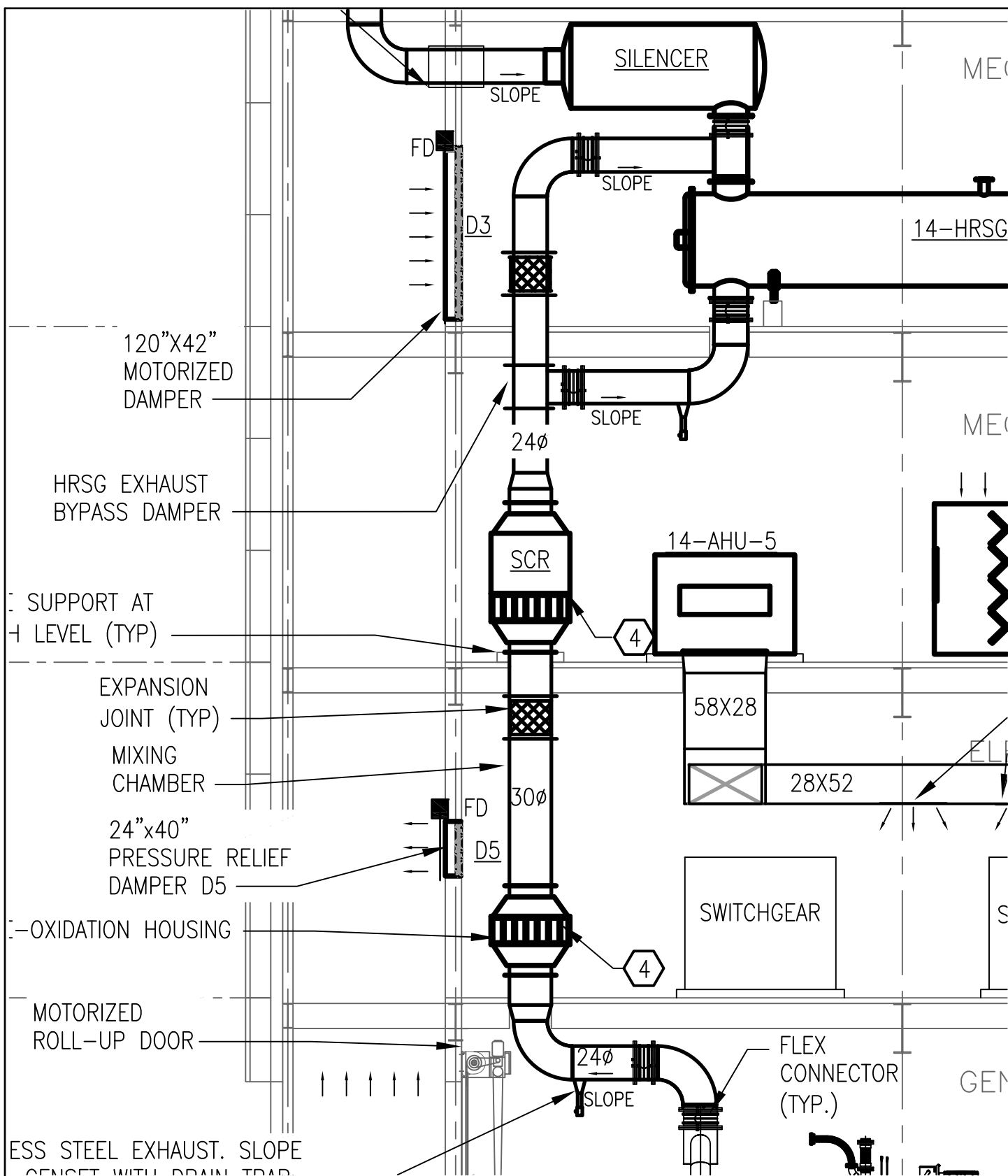
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RWP

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Drawing Reference

MH-301

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SK-03

ADD01

URS

1000 Abernethy Road N.E., Suite 900
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URS Project: 15290200

Project: 508-13-400 VA701-13-R-0054

ATLANTA VA MEDICAL CENTER
COMBINED HEAT AND POWER (CHP) AND NEW
STEAM GENERATION SYSTEM, DECATUR, GA

Date

25 JULY 2014

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