

Division 9

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Section 9A

Gypsum Board Ceilings

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DIVISION 9

SECTION 9A

GYPSUM BOARD CEILINGS

1.0 SCOPE

This Specification Section includes the furnishing and installation of gypsum board ceilings and metal suspension system all as indicated on the drawings and as described in the specifications.

2.0 GENERAL

2.1 Codes and Standards

The Work shall conform to the latest edition and latest addenda thereto, as of date of award, of the following codes and standards.

.1 American Society For Testing and Materials

C36	Gypsum Wallboard
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.2 Federal Specifications

QQ-W-461	Wire, Steel, Carbon (Round, Bare and Coated)
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QQ-W-423	Wire, Steel, CorrosionResisting
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3.0 DETAILED REQUIREMENTS

3.1 Materials

3.1.1 Gypsum Wallboard

Gypsum wallboard shall conform to ASTM C-36. Sheets shall be 48 inches wide, and shall be 5/8 inch thick. All gypsum wallboard sheets shall have tapered edges. Wallboard for Boiler Room ceiling shall be double layer solid 5/8" sheetrock "Firecode" gypsum wallboard, or equal approved by Engineer.

### 3.1.2 Joint Cement

Joint cement shall be an adhesive cement recommended by the manufacturer of the gypsum wallboard.

### 3.1.3 Reinforcing Tape

Reinforcing tape shall be as recommended by the manufacturer of the gypsum wallboard.

### 3.1.4 Laminating Adhesive

Laminating adhesive shall be of the type and manufacture recommended by the manufacturer of the gypsum wallboard.

### 3.1.5 Screws

Screws for fastening wallboard to steel framing shall be self-drilling, self-tapping, Phillips head screws; black oxidized finish. Lengths of screws shall be as recommended by manufacturer of gypsum wallboard.

### 3.1.6 Hangers

Hangers supporting runner channels shall be soft steel wire not less than 12 gage in diameter, conforming to Federal Specification QQ-W-461, steel number 1010, Class 2 zinc coating. Flat iron or steel straps, 3/32 by 7/8 inch minimum size coated with zinc, cadmium, or rust-inhibiting paint may be substituted for the wire hangers.

### 3.1.7 Tie Wire

Tie wire shall be of corrosion-resisting steel, conforming to Federal Specification QQ-W-423, composition 302, 305, or 315, Condition A. The wire shall be not less than 0.0625 inch in diameter.

### 3.1.8 Steel Runner Channels

Steel runner channels shall be hot or cold-rolled steel and shall be given a shop coat of rust-inhibiting paint or shall be galvanized. Channels shall have flanges not less than 7/16 inch wide. Channels shall be 1-1/2 inches deep weighing at least 1.12 pounds per lineal foot if of hot-rolled steel and at least .475 pound per lineal foot if of cold-rolled steel.

### 3.1.9 Steel Furring Channels

Steel furring channels shall be roll-formed using electro-galvanized steel with a minimum thickness of 25 gage. Channels shall be 7/8 inch deep, 2-3/4 inches wide overall, with 2 inch wing flanges and 1-3/8 inch wide web. Channels shall be furnished in 12 foot lengths minimum. Steel furring channels shall be United States Gypsum Company Type DWC, or equal approved by Engineer.

### 3.2 Delivery and Handling

Manufactured materials shall be delivered in the original packages, containers and bundles bearing the name of the manufacturer and the brand name. Wallboard shall not be delivered to the building until windows are glazed and exterior doors are in place. When delivered, the wallboard with unbroken bundling tape shall be neatly piled flat on the floor without overloading the floor.

## 4.0 INSTALLATION

### 4.1 Suspended Ceiling System

Suspended ceiling system shall consist of 1-z inch runner channels and 7/8 inch deep furring channels, suspended by hanger wires or straps.

Hangers shall be spaced not more than 48 inches in one direction and 36 inches in the other direction. Hangers at ends of runner channels shall be not more than 8 inches from the wall. Method of fastening hangers to building construction shall be approved by Engineer.

Runner channels shall be spaced 36 inches on centers maximum. Each hanger wire shall be saddle-tied with tie wire to the runner channels and secured by at least three turns around the hanger wire. Strap type hangers shall be fastened to the runner channels with galvanized bolts.

Furring channels shall be spaced 24 inches on centers maximum. Furring channels shall be securely saddle-tied to runner channels at each crossing with tie wires. Where furring channels are spliced, the ends shall be overlapped and securely tied near each end of the splice with two loops of tie wire. Furring channels shall be located within 4 inches of parallel

walls and shall be cut short of abutting walls z inch plus or minus 4 inch.

## 4.2 Gypsum Board

### 4.2.1 Single Ply

Wallboard shall be applied to the ceilings with the long dimension of the wallboard parallel to or at right angles to the furring channels and shall be constantly supported in such manner as to prevent sagging along the entire length of the wallboard.

Wallboard shall be secured by special screw application developed especially for dry wall installation. The installation, including type of screws and the special tool for driving the screws shall be in strict conformance with the printed instructions of the manufacturer of the gypsum wallboard.

Fastening shall begin at the center of the panel and proceed toward the edges or ends, with the fastening completed on each furring channel before proceeding to the next furring channel. Fastening shall be finished in the furring channels on the same side of the center of the panel before fastening is commenced on the other side of the center of the panel. Screws shall be spaced on 12 inch centers maximum. Screws shall not be placed closer than 3/8 inch from edges and ends of the panel.

### 4.2.2 Two Ply

The first ply shall be so applied that the minimum of end joints and the least possible amount of joint treatment occur in the finish ply. At the contractor's option, the first ply may be made up of backing-board panels. The finish ply shall be bonded to the first ply with laminating adhesive applied as recommended by the manufacturer of the wallboard.

Securing of the first ply shall begin at the center of the panel and proceed toward the edges or ends in the same manner as that specified in subparagraph 4.2.1 above.

The second ply with adhesive applied on back surface shall be held firmly in place at the point of fastening and screwed a maximum of 12 inches on centers on each channel member, with sixpenny duplex-head nails. Fastening shall commence at the center of the panel and proceed toward the edges or ends, with the fastening completed on each channel member before proceeding to the next member. Screw holes shall be filled flush with joint adhesive. At the Contractor's option, a shoring system may be used to hold the second ply in place during the adhesive drying period. Shoring shall be left in place for at least 24 hours. If shoring is used, shop drawings showing the proposed shoring system shall be submitted to and approved by Engineer.

#### 4.3 Joint and Screw-Depression Treatment

##### 4.3.1 Joint Treatment

###### a. First Step

Joint cement shall be applied to the tapered edges of the boards with a joint-finishing knife. The channels shall be filled evenly by using moderate pressure on the knife. Reinforcing tape shall be applied over the full length of the joint and embedded in the cement by using moderate pressure on the knife. Excess cement shall be removed, after which the tape shall be given a thin coat of cement. End joints shall be filled with the cement and taped in a similar manner. The cement shall be sanded only as may be necessary to remove high spots.

###### b. Second Step

A second coating of joint cement shall be applied to the joints and shall be feathered out as far as may be necessary to obtain a smooth surface.

###### c. Third Step

After the second coating has dried, a third coating shall be applied very thin to a smooth surface and feathered out 12 to 16 inches on

both sides of the joint. If necessary, the joint shall be sanded lightly when dry with 2/0 sandpaper to leave a smooth, flush surface. Care shall be taken not to scuff the paper surface of the wallboard when sandpapering the cement.

#### 4.3.2 Screw-Depression Treatment

Boards shall be fastened tight against the supporting framework before concealing the screw depressions. The depressions shall be filled with at least 3 coatings of joint cement, and each coating shall be allowed to dry before the succeeding coating is applied. Where necessary, the last coating shall be sanded lightly with 2/0 sandpaper to leave a smooth finish flush with the paper face of the board.

#### 5.0 TESTING

No additional tests beyond those normally employed either in manufacturing, installation or construction processes or as called for by the specified codes and standards are required under this article.

#### 6.0 INFORMATION TO BE SUBMITTED

The following information and data shall be submitted:

##### 6.1 Drawings

Drawings shall show dimensions and detail of construction, installation and relation to adjoining and related work which will require cutting or close fitting and other work required for complete installation. Drawings shall be submitted 30 days after award.



Section 9B

Acoustical Ceiling Units

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DIVISION 9

SECTION 9B

ACOUSTICAL CEILING UNITS

1.0 SCOPE

This Specification Section includes the furnishing, and installation of prefabricated acoustical ceiling units and metal suspension system, all as indicated on the drawings and as described in the specification.

2.0 GENERAL

2.1 Codes and Standards

The Work shall conform to the latest edition and latest addenda thereto, as of date of award, of the following codes and standards.

.1 Federal Specifications

QQ-W-461	Wire, Steel, Carbon (Round, Bare and Coated)
SS-S-118	Sound Controlling Blocks & Boards (Acoustical Tiles & Panels, Prefabricated)

3.0 DETAILED REQUIREMENTS

3.1 Materials

3.1.1 Acoustical Ceiling Units

Acoustical units shall conform to Federal Specification SS-S-118, Class A, (incombustible) Type II (random perforated pattern), or III (fissured pattern), Grade 5.

Acoustical ceiling units shall have a factory applied washable white paint finish with a light reflectance value of 75 percent or over.

Acoustical units shall be 5/8 inch thick, lay-in type, 24 inches by 48 inches (nominal) in size, with square edges. Units shall not be cross-scored.

### 3.1.2 Suspension System

Suspension system for lay-in ceiling units shall be a combination of electro-galvanized, bonderized, prime coated, main beam tees and cross tees, angle moldings, wire hangers and accessories. Exposed flanges of tees and angle moldings shall have factory applied high-bake white enamel finish. It shall be possible to lift out and replace individual ceiling units without cutting, damaging or using undue force.

Main beam tees shall be of not less than .025 inch thick cold rolled steel, double web, bulb tee section approximately 1-2 inch high. Bottom flange is to be 15/16 inch wide, faced with a roll formed cap.

Cross tees shall be of not less than .018 inch thick cold rolled steel, double web, bulb tee section approximately 1-4 inch high. Bottom flange is to be 15/16 inch wide, faced with a roll formed cap.

Angle molding shall be of not less than .020 inch thick cold rolled steel. Angle molding shall be approximately 1 inch by 1 inch.

Hangers shall be soft steel wire not less than 12 gage in diameter, conforming to Federal Specification QQ-W-461f, steel number 1019, with Class 2 zinc coating. Flat iron or steel straps, 3/32 by 7/8 inch size, coated with zinc, cadmium, or rust-inhibiting paint may be substituted for the wire hangers.

Accessories, including clips and fasteners, shall be specifically designed as an integral part of the suspension system, and shall be those recommended by the manufacturer of the suspension system.

## 4.0 INSTALLATION

### 4.1 Ceiling

Windows and doors in areas where acoustical ceiling units are to be installed shall be in place and glazed. A temperature of 70 degrees F and a relative humidity of 55 percent within areas where acoustical units are to be installed shall be maintained as nearly as possible before, during and after installation.

Contractor shall be responsible for the examination and acceptance of all surfaces and conditions affecting the proper installation of acoustical units, and the installation of acoustical units shall constitute an acceptance by him of all such surfaces and conditions as satisfactory for proper acoustical work.

Hangers shall be spaced so that suspension system shall support the ceiling load, deflection not to exceed  $1/360$  of the span between hangers. Method of fastening hangers to building construction shall be approved by the Engineers.

Runner tees and cross tees shall be set true, square and in a level plane. Members shall be locked together to prevent slippage and shall provide continuous support along all edges of each acoustical unit, as recommended by the manufacturers of the acoustical units used. During erection, the joints around electric outlets, ducts, pipes and other work extending through the acoustical units shall be sealed tight with plastic calking compound. Metal edge moldings shall be provided along the perimeter of the units for each room, space, or panel; unless otherwise indicated.

#### 4.2 Cleaning

Following erection, dirty or discolored surfaces of acoustical units shall be cleaned and left free from defects. Units that are damaged or improperly installed shall be removed and replaced.

#### 5.0 TESTING

No additional tests beyond those normally employed either in manufacturing, installation, or construction processes or as called for by the specified codes and standards are required under this article.

## 6.0 INFORMATION TO BE SUBMITTED

The following information and data shall be submitted 30 days after award of contract.

### 6.1 Samples

Samples of the following materials shall be submitted and approved before any materials are delivered to the project site. Materials delivered prior to such approval will be subject to rejection.

Duplicate 12 by 12-inch samples showing the manufacturer's stock, texture, finish, and color of the exposed to view surfaces of acoustical units proposed for use.

Duplicate samples of each component of metal suspension system proposed for use, not including hangers.

Section 9C

Ceramic Tile

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DIVISION 9

SECTION 9C

CERAMIC TILE

1.0 SCOPE

This Specification Section includes the furnishing and installation of ceramic floor and wall tile all as indicated on the drawings and as described in the specification.

2.0 GENERAL

2.1 Codes and Standards

The Work shall conform to the latest edition and latest addenda thereto, as of date of award, of the following codes and standards.

.1 American Society For Testing and Materials Standards (ASTM)

C207 Hydrated Lime for Masonry Purposes

.2 Federal Specifications

HH-F-341 Fillers, Expansion  
Joint; Bituminous & Non-bituminous  
(Preformed; for Concrete)

RR-F-221 Fencing, Wire (Barbed Wire, Woven Wire  
and Netting), Fence Posts

SS-C-192 Cement, Portland

SS-T-308 Tile, Floor, Wall and Trim Units, Ceramic

TT-S-230 Sealing compound, synthetic rubber base,  
single component, chemically curing (for  
caulking, sealing & glazing in building  
construction.)

.3 American National Standards Institute

A108.5

Ceramic Tile Installed with Dry-Set  
Portland Cement Mortar

A118.1

Dry-Set Portland Cement Mortar

3.0 DETAILED REQUIREMENTS

3.1 Materials

Manufacturer's original containers, bundles or packages shall be delivered to the project site unopened, with seals unbroken and label intact, and shall not be opened until inspected.

3.1.1 Lime

Lime shall conform to ASTM C207, Type S.

3.1.2 Portland Cement

Portland cement shall conform to Federal Specification SS-C-192, Type I.

3.1.3 Reinforcement

Reinforcement in setting beds shall conform to Federal Specification RR-F-221, Type C, 1 - or 2 inch mesh wire netting of not lighter than 18-gage wire.

3.1.4 Expansion-Joint Filler

Premolded expansion-joint filler strip shall conform to Federal Specification HH-F-341, Type II, Class A.

3.1.5 Sealant

Sealant for use in expansion joints and elsewhere designated in connection with ceramic tile shall be a singlecomponent, synthetic-rubber-base type complying with Federal Specification TT-S-230. Color of sealant shall match adjacent materials.



### 3.1.6 Sand

Sand for setting beds, and grout shall be clean, washed sharp, durable particles, free from silt, loam, clay, soluble salts and organic impurities, and shall be wellgraded from coarse to fine within the limits noted for its specific use, as follows:

<u>Specific Use</u>	<u>No. 8 Sieve</u>	<u>No. 16 Sieve</u>	<u>No. 30 Sieve</u>	<u>No. 100 Sieve</u>
Setting beds for floors	100	--	--	Not more than 5
In 1/16 inch thick mortar setting bed for wall tile	--	--	100	--
In mortar setting bed thicker than 1/16 inch, for wall tile	--	100	--	--
Grout	--	--	100	Not more than 5

### 3.1.7 Tile

Tile shall conform to Federal Specification SS-T-308 and shall be standard grade. Labels on containers shall be marked to correspond with the marks on the signed "master grade certificate" specified hereinafter. Sizes specified are nominal.

#### 3.1.7.1 Floor Tile

Ceramic mosaic floor tile shall be natural clay tile, Type I, Class B, Form 3. Tile shall be ceramic mosaic sizes, 4 inch thick, and shall be sheet mounted in a 3-unit random mosaic pattern using a combination of tiles 1 inch by 1 inch, 1 inch by 2 inches and 2 inches by 2 inches in size. Colors shall be selected by Engineer from samples or brochure from the manufacturer.

#### 3.1.7.2 Wall Tile

Glazed ceramic wall tile and trimmers for walls and wainscots shall be approximately 3/8 inch thick. Glazed

wall tile shall be Type II, 4-4 inches in size, and trimmers shall be Type III, Class E, and shall have matte glazed finish on exposed-to-view surfaces. Stops, returns, trimmers, caps and special shapes shall be provided as required for jambs, recesses, offsets and other conditions so as to provide a complete and neatly finished installation. Colors shall be as selected by Engineer from samples or brochures from the manufacturer.

#### 3.1.8 Water

Water shall be clean and free from injurious amounts of oil, acids, soluble salts and organic impurities.

#### 3.1.9 Mortar

Dry-set Mortar for wall tile installation shall conform to ANSI Specification A118.1.

### 4.0 INSTALLATION

Work required under this section of the specification shall not be performed unless the ambient temperature of the area in which the work occurs is at least 50 degrees F and rising. Adequate ventilation shall be provided to take off fumes.

#### 4.1 Floor Tile

Floor tile operations in spaces requiring wall tile shall not be started until after the wall tile installation has been completed. Surfaces to receive the various applications of materials shall be clean and free of dirt, dust, oil grease or other objectionable matter. Setting beds and tile shall be installed with their respective surfaces to true planes, level, or pitched to drains, so that surface of the completed flooring will be at the elevations and grades shown on the drawings. Retempering of mortar will not be permitted. Tile shall be laid out from the center lines of each space outward and adjustments made along walls, partitions and borders, if any, so as to symmetrize the pattern with a minimum of cut tiles. Joints between the tiles shall be of uniform width. Fractional changes in dimensions without varying the uniformity of joint width will be permitted. Tile shall be cut with a cutting tool, and rough edges shall be rubbed smooth. Cut-tile misfits shall be replaced. Tile shall be laid to straight edges.

Straight edges shall be set to the lines established and reset at intervals to keep the joints parallel over the entire area.

Setting beds for ceramic mosaic tile flooring shall be composed by volume of one part Portland cement to five parts dry sand, or six parts damp sand, to which not more than 1/10 part hydrated lime may be added, and shall be mixed with the minimum amount of water necessary to produce a workable mass. Only as large an area of setting bed shall be spread at one time as can be covered with tile before the mortar has obtained its initial set. Surplus mortar shall be removed, and the setting beds shall be spread, tamped to force out air pockets, and screeded. The average thickness of setting bed in any room or space shall be one (1) inch in no case less than 3/4 inch or more than 1-4 inches.

Each setting bed shall be reinforced with one (1) layer of reinforcement specified herein, with the uncut edges lapped the width of one (1) mesh and with cut ends and edges lapped not less than two (2) inches. Laps shall be tied together with galvanized 18-gage iron or soft-steel wire at intervals of not more than ten (10) inches along the finished edges and not more than six (6) inches along the cut ends and edges. The reinforcement shall be supported and secured in the centers of setting beds, and elsewhere, as necessary to hold the reinforcement flat.

Ceramic mosaic floor tile shall be installed by the following method:

As soon as the setting bed has set sufficiently to be worked upon, a dust-coat of dry Portland cement not more than 1/16 inch thick shall be sprinkled over the surface and lightly worked with a steel trowel. Tile laying shall begin as soon as the moisture, not free water, has penetrated the dust coat. A thin skin coat of neat Portland-cement grout shall be troweled or brushed onto the backs of tiles immediately before each sheet is laid. Tile sheets shall be laid on the freshly prepared setting bed while the surface is still plastic and the tile then tamped into the mortar to insure solid bedding to the exact slope or level of finished floor surface.

Floors shall be covered with waterproofed paper

with all joints lapped at least four inches and the laps tape-sealed or held down with planks or other weights, and allowed to damp-cure for at least 72 hours before foot traffic is permitted thereon.

When installation has hardened sufficiently, the paper, sheets and pasting glue shall be removed by brushing only as much water as necessary onto the paper. Misplaced tiles shall be repositioned and reset, and damaged or defective tile shall be replaced. A thick creamy slurry of neat gray water-proofed Portland cement and a minimum amount of water shall be brushed or squeezed over the floor until all joints are thoroughly filled. The surfaces of the floor shall be very gently rubbed with a wood block to bring tile surfaces to true planes, excess slurry shall be removed, and the floor shall be rubbed with burlap to clean the tile and finish the joints.

#### 4.2 Wall Tile

Joints shall be straight, level, perpendicular and of even width not exceeding 1/16 inch. Wainscots shall be built of full courses, which may extend to a greater height, but in no case lower than the height shown. Vertical joints shall be maintained plumb for the entire height of the tile work. Each tile shall be brought to true level and plane. Tiles that are out of true plane or misplaced shall be removed and reset. Damaged or defective tile shall be replaced. Tile shall be installed using dry-set mortar bed applied directly to concrete and concrete masonry walls, in accordance with ANSI specifications for installation of ceramic tile with dry-set Portland cement mortar, A108.5

Joints in wall tile, after the edges of tiles have been thoroughly wet, shall be grouted full with white, waterproof Portland cement grout certified by manufacturer as suitable for intended use. Fill all joints flush with surface of tile, following grout manufacturer's directions explicitly. Fill all gaps and skips. Do not permit dark cement to show through grouted white joints. Joints between wall tile and plumbing or other built-in fixtures shall be filled with light-colored calking compound.

Immediately after the grout has had its initial set, tile wall surfaces shall be given a protective coat of noncorrosive soap, or other approved method of protection shall be provided. Joints shall be damp-cured for 72 hours.

#### 4.3 Cleaning

Upon completion, tile floor and wall surfaces shall be thoroughly cleaned in a manner which will not affect tile surfaces.

#### 4.4 Protection

The floors shall be covered with building paper before foot traffic is permitted over finished tile floors. Board walkways shall be laid on floors that are to be continuously used as passageways by workmen. Tiled floor areas to bear truck traffic shall have continuous plank runways of required width installed over the building paper. Damaged or defective tiles shall be replaced.

#### 5.0 TESTING

No additional tests beyond those normally employed either in manufacturing, installation or construction processes or as called for by the specified codes and standards are required under this article.

#### 6.0 INFORMATION TO BE SUBMITTED

The following information and data shall be submitted.

##### 6.1 Samples

The following samples of materials proposed for use shall be submitted for approval, 30 days after award of contract.

- a. Duplicate sheets of floor tile, each about twelve inches square, showing colors and patterns of each type, class and form.
- b. Duplicate panels of four wall tiles, each showing range in shades of each color.
- c. Duplicate pieces of trimmers of each color and shape.

## 6.2 Certificates

Certificates shall be furnished. Each certificate shall be signed by Contractor and an authorized officer of the tile manufacturing company, and shall contain the name and address of Contractor, and project location, and the quantity and date or dates of shipment or delivery to which the certificate applies. Certificates certifying compliance with specification requirements shall be furnished for the following materials.

- a. Dry-set mortar
- b. All tile (one "master grade certificate").

Section 9D

Flooring, Resilient Tile

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DIVISION 9

SECTION 9D

FLOORING, RESILIENT TILE

1.0 SCOPE

This Specification Section includes the furnishing and installation of vinyl-asbestos tile flooring and vinyl base all as indicated on the drawings and described on the specification.

2.0 GENERAL

2.1 Codes and Standards

The Work shall conform to the latest edition and latest addenda thereto, as of date of award, of the following codes and standards:

.1 Federal Specifications

SS-T-312

Tile; Floor, Asphalt, Rubber, Vinyl, Vinyl  
Abestos

.2 Rubber Manufacturers Association, Inc.

FVC-261

Flexible Vinyl Cove Base

3.0 DETAILED REQUIREMENTS

3.1 Materials

.1 Vinyl-asbestos tile shall be 12 inches by 12 inches square, 1/8 inch thick. Color of tiles shall be selected by Engineer from marbelized color range.

.2 Base shall be premolded vinyl, top-set cove type, four inches high, 1/8 inch thick. Color of base shall be selected by Engineer from Manufacturer's standard colors.

.3 Vinyl-asbestos tile and vinyl base shall be manufactured by Kentile, Inc., Johns-Manville, or equal approved by Engineer.



.4 Adhesive for installation of vinyl-asbestos tile and vinyl base shall be water resistant and of type recommended by manufacturer of materials selected for use.

.5 Materials shall be delivered to the site in the manufacturer's original unopened containers with the manufacturer's brand and name clearly marked thereon.

### 3.2 Storage of Materials

Materials shall be stored at a minimum temperature of 70 degrees F for at least 48 hours before installation. In the space where vinyl-asbestos tile is being installed, a temperature of at least 70 degrees F shall be maintained from 48 hours before installation until 48 hours after installation.

## 4.0 INSTALLATION

### 4.1 Preparation of Subfloor

Surfaces to receive tile shall be swept clean and shall be free from moisture, paint, oil and wax. Cracks, rough areas or other surface defects of concrete floors shall be filled with plastic material. Ridges, trowel marks, and other surface projections shall be ground smooth.

Prior to starting the work Contractor shall test concrete subfloors for moisture content in the following manner:

After concrete subfloors have been properly cleaned, small patches of adhesive shall be spread in several locations in each room and allowed to dry or set overnight. If the set adhesive can be peeled easily from the subfloor, the test shall be repeated at intervals until the adhesive adheres properly. When the adhesive adheres tightly to the subfloor, the tile shall be installed.

The commencing of installation work in any space shall be construed as acceptance of preceding work and as a waiver of any subsequent claims to the contrary.

### 4.2 Installation of Floor Tile and Base

#### 4.2.1 Adhesive

Method of application and time allowed for setting shall be in accordance with tile manufacturer's recommendations.

#### 4.2.2 Tile

When the adhesive is sufficiently dry, the tile shall be installed in a straight all-over one color pattern, starting from axis that will produce opposite borders of equal width and not less than half the tile width. Tile shall be laid in such manner that the entire undersurface will be securely bonded in place. Tile shall be tightly fitted so that each tile is in contact with the surrounding tiles and joints are aligned. The graining in alternate jaspe or marbelized tiles shall be reversed.

#### 4.2.3 Base

When the adhesive is sufficiently dry, the base shall be installed in long lengths with as few joints as possible. All joints shall be tight and the base throughout its entire length shall have its top and bottom edges in firm contact with the walls and floor. Premolded corners shall be provided for all internal and external corners.

#### 4.3 Cleaning

The tile shall be thoroughly cleaned of cement spots, dirt and other soiling and shall be left in a condition satisfactory for waxing. Spots shall be removed by means of a putty knife and steel wool, or by a cloth moistened with a neutral soap of a type approved by the manufacturer of the tile. The use of solvents, wet-mopping and washing are prohibited.

#### 4.4 Waxing

When resilient flooring materials have been seated and cleaned, as hereinbefore specified, the tile surfaces shall be waxed and buffed. Two (2) coats of a non-slip wax, of a type recommended by the tile manufacturer, shall be applied to the tile surfaces and each coat shall be machine buffed. Waxing and buffing shall be done in accordance with the manufacturer's instructions.

#### 4.5 Protection

From the time of cleaning and waxing until acceptance, the tile shall be protected by a covering of heavy paper, and by board walks in areas where damage to the floor may occur because of subsequent building operations.

#### 5.0 TESTING

No additional tests beyond those normally employed either in manufacturing, installation or construction processes or as called for by the specified codes and standards are required under this article.

#### 6.0 INFORMATION TO BE SUBMITTED

The following information and data shall be submitted 30 days after award of contract.

#### 6.1 Samples

The following samples of materials proposed for use shall be submitted for approval before materials represented by the samples are delivered to the project site.

Floor Tiles - Two (2) sample tiles for each color selected.

Vinyl Base - Two (2) pieces 12 inches long for each color selected.

Section 9E

Lathing and Plastering

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DIVISION 9

SECTION 9E

LATHING AND PLASTERING

1.0 SCOPE

This Specification Section includes the furnishing of suspended metal lath and Keene's cement plaster ceiling all as indicated on the drawings and as described in the specifications.

2.0 GENERAL

2.1 Codes and Standards

The work shall conform to the latest edition and latest addenda thereto, as of date of award, of the following codes and standards.

.1 American Society for Testing and Materials

C29	Unit Weight of Aggregate
C35	Inorganic Aggregate for use in Gypsum Plaster
C61	Keene's Cement

.2 Federal Specifications

QQ-W-461	Wire, Steel, Carbon (Round, Bare and Coated)
SS-L-351	Hydrated Lime (for) Structural Purposes
SS-P-402	Plaster; Gypsum

3.0 DETAILED REQUIREMENTS

3.1 Materials

### 3.1.1 General

All manufactured materials shall be delivered in the original packages, containers and bundles bearing the name of the manufacturer and the brand. Plaster shall be stored off the ground under water-tight cover, and away from sweating walls and other damp surfaces, until ready for use. Damaged or deteriorated materials shall be removed from the premises.

### 3.1.2 Runner Channels and Furring Channels

Runner channels and furring channels shall be of zinc-coated cold rolled steel, with flanges not less than 7/16 inches wide. Runner channels shall be 1/2 inches deep, weighing at least 475 pounds per 1000 lineal feet. Furring channels shall be 3/4 inches deep, weighing at least 300 pounds per 1000 lineal feet.

### 3.1.3 Hangers

Hangers supporting runner channels shall be of zinc-coated soft steel wire, not less than 0.1620 inch in diameter (8 gauge), conforming to Federal Specification QQ-W-461.

### 3.1.4 Metal Lath

Metal lath shall be 3/8 inch rib lath cut from copper-bearing steel sheets and provided with a complete bituminous coating or cut from galvanized sheet steel. Metal lath shall weigh not less than 3.4 pounds per square yard.

### 3.1.5 Casing Beads

Casing beads shall be of zinc-coated steel, square edge type, with expanded metal wiring. As far as stock lengths will permit, beads shall be provided at openings in plaster ceilings and at intersection of plaster ceiling with any and all vertical surfaces.

### 3.1.6 Keene's Cement

Keene's cement shall conform to ASTM C61.

### 3.1.7 Hydrated Lime

Hydrated lime shall conform to Federal Specification SS-L-351.

### 3.1.8 Aggregate for Gypsum Base Coats

Perlite aggregate for gypsum base coats shall conform to ASTM C35. The unit weight of aggregates shall be determined in accordance with ASTM C29.

### 3.1.9 Sand

Sand for Keene's cement plaster shall conform to ASTM C35.

### 3.1.10 Gypsum Basecoat Plaster

Gypsum basecoat plaster shall be an incombustible material made from gypsum rock complying with Federal Specification SS-P-402, Type N. For the scratch coat on metal lath it shall be fibered.

## 4.0 INSTALLATION

### 4.1 Protection of Work and Building

Finished work such as doors, frames, walls, trim, electrical panels, and other built in work shall be covered with heavy-gauge plastic, or building paper. All edges shall be taped down or drawn tight.

Any spill or drip shall be taken up at once and any sand, sawdust, or other protection used for floors, if removed, shall be replaced with new material.

Plaster shall be kept from freezing for 24 hours after application and no finish coat shall be applied to a base which is frozen.

### 4.2 Suspended Metal Lath Ceilings

Piping, ducts, electrical and all other work that is to be concealed by the ceiling shall be completed and inspected, and the proper ceiling height and level established before work is started.

#### 4.2.1 Hangers

Hangers shall be spaced not more than 4 feet on centers along runner channels and around any ducts, chases or other framed openings. The starting row of hangers shall be located 6 inches away from wall surfaces.

Hangers shall be of sufficient length to permit saddle-tying around runner channels in a manner that turning or twisting of the runners will be prevented and the full strength of the hangers developed. Upper ends of hangers shall be secured to the structural frame by means of approved anchorage devices.

#### 4.2.2 Runner Channels

Main runner channels shall be spaced not to exceed 3 feet on centers in parallel rows, and also where necessary to frame around any openings or projections through the ceiling. Runners shall be kept clear of abutting walls and partitions. Ends of spliced main runner channels shall overlap 12 inches (with flanges of channels interlocked) and shall be tied securely with two loops of 0.0625-inch diameter zinc-coated wire at both ends of splice.

Cross-furring channels shall run transversely to the direction of main runners and in parallel rows. Spacing shall be 16 inches on centers. Members shall be saddle-tied to runners at each crossing and at ends by 0.0625-inch diameter stainless-steel or monel wire or 0.1483-inch diameter stainless-steel or monel wire hairpin clips. Splices shall be 8 inches, interlocked and ties as specified above for main runners.

#### 4.2.3 Metal Lath

Metal lath sheets shall run with their long dimension across the furring channels. Lath shall be tied to crossfurring and along side and end laps at 6-inch intervals with 0.0475-inch diameter stainless steel or monel wire. Sides shall be lapped by nesting outside ribs or selvage. End laps shall be one inch and shall occur over supports.

#### 4.3 Mixing of Plaster

Unless otherwise approved by Engineer, mechanical mixing machines shall be used for mixing of plaster. Machines shall



be cleaned after each mixing and kept free of plaster from previous mixings.

Hoes, shovels, and other tools shall be kept clean and shall not be rinsed in the mixing water.

No more material shall be mixed than can be applied in one hour. Plaster shall not be retempered after it has commenced to set.

All plaster shall be thoroughly and uniformly mixed.

Scratch or first coat shall consist of 100 pounds of gypsum-basecoat plaster to not more than 2 cubic feet of perlite, with sufficient water to make a workable mix.

Brown or second coat shall consist of 100 pounds of gypsum-basecoat plaster to not more than 3 cubic feet of perlite, mixed with water to make a workable mix.

Keene's cement finish coat shall consist of 100 pounds of Keene's cement, 25 pounds of dry hydrates lime and 10 pounds of fine sand with sufficient water to make a workable mix.

#### 4.4 Plastering

A temperature of not less than 55 degrees F shall be maintained in the building prior to application of the plaster, during its application and until it is completely dry. Properly regulated ventilation shall be provided for drying the plaster during and after its application.

Plaster shall be applied in 3 coats, total thickness shall be not less than 3/4 inch over metal lath.

The first coat shall be applied with sufficient pressure, and the plaster shall be sufficiently plastic to curl the keys around the back of metal lath and to cover well and then be cross raked or scratched to a rough surface.

The second coat shall be applied after the first coat has set firm and hard, and shall be brought out to grounds and straightened to a true surface with rod and darby, without application of water, and cross raked or scratched.

Finish coat shall be applied over a partially dry, level and roughened second coat. The finish coat shall be scratched in thoroughly and immediately doubled back to fill out to a true, even surface. Thickness shall be from 1/16 inch to 1/8 inch.

Finish coat shall be water troweled during the set to provide a smooth, dense surface, free from irregularities, blemishes and burn-throughs.

#### 4.5 Patching

After drying, all work shall be pointed up around trim and other work, and any defective and damaged plaster shall be cut out and patched. Patching shall match existing work in texture and finish, and joinings with plaster previously applied shall finish flush and smooth.

#### 4.6 Cleaning

At the completion of the finish plaster work, all covers shall be removed and metal trim, beads and other protected work shall be cleaned. All plaster rubbish and debris, scaffolding and tools shall be removed from the building, leaving the floors broom-clean.

#### 5.0 TESTING

No additional tests beyond those normally employed in manufacturing installation or construction processes or as called for by the specified codes and standards are required under this article.

#### 6.0 INFORMATION TO BE SUBMITTED

There will be no technical information required in bid form.

## SECTION 9F

### FINISH PAINTING AND COATINGS

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DIVISION 9

SECTION 9F

FINISH PAINTING AND COATINGS

1.0 SCOPE

This specification covers the surface preparation, method of application and coating materials to be used for shop painting of fabricated equipment and components, structural steel, and above ground piping; and for field painting of equipment, structures and piping.

Buildings shall not be painted under this specification. For building painting requirements, see Specification 'Section 13A - Prefabricated Buildings.

2.0 GENERAL

2.1 Codes and Standards

References herein to Specification SSPC shall be understood to refer to Steel Structures Painting Council of Pittsburgh, Pennsylvania, latest edition and latest addenda thereto, as of date of award.

2.2 Work to be Provided

Coating materials shall be supplied by Dearborn Chemical Division, W. R. Grace & Co., or shall be products of equal quality acceptable to both the owners and consulting engineers.

Coatings shall be delivered to the job site in the original containers bearing the manufacturer's labels.

Coating manufacturer's recommendations as to application and system combinations of coatings shall be followed. All superimposed primers and coatings shall be compatible.

All work shall be performed in a first-class manner by skilled painters according to recognized good practice.

All coatings must be uniformly applied to form a smooth continuous film free from sags, runs, spots, or other blemishes.

Edges and crevices are to receive particular attention; extra paint shall be applied to these surfaces to assure coverage.

Surfaces shall not be painted during wet weather, damp foggy weather, or when the metal surface temperature is below the dew point. Painting shall not be done when the metal surface or ambient temperature is below 400 F. With chemically cured coatings, particular attention shall be exercised to follow manufacturer's special temperature requirements (usually 500 F. minimum).

Basic painting procedures shall be carried out in accordance with Specification SSPC-PA-1-64.

### 3.0 DETAILED REQUIREMENTS

#### 3.1 Materials

The term "paint" as used herein includes emulsions, enamels, paints, sealers, stams, varnish and coatings whether used as prime, intermediate or finish coats.

Contractor shall refer to Table 1 - Shop Painting and Table 2 - Field Painting for the materials listed and to the drawings for the extent of work covering structural steel, equipment and piping which require painting.

#### 3.2 Room for Storage and Mixing Paint

Contractor shall make provision, as directed by Contractor for storage and mixing of his materials. He shall be responsible for observing all regulations required for storage of paint, including posting necessary safety signs, fire extinguishing equipment, as required by local, State, and Fire Underwriters' Codes and in conformity with good practice. Contractor shall deposit with Engineer, keys for watchman service to provide access to storage area during non-working hours.

#### 3.3 Safety

All painting shall be done under conditions and in a manner dictated by safe practice, using materials, tools, and rigging of safe character. Contractor shall comply with recognized safety rules and practices necessary to permit safe working conditions for the workmen as well as to prevent hazards

to others who may be in the vicinity of the work. Painting on or in the vicinity of energized electrical or rotating equipment, apparatus or lines shall not be done without approval of Engineer. Heavy concentrations of volatile or toxic fumes must be avoided. In confined spaces, blowers or exhaust fans may be necessary. Where good practice dictates, masks, non-sparking tools and other such special equipment shall be used.

### 3.4 Protection

Before work of finish painting is completed, finished work of other trades shall be in place. Contractor shall take all necessary precautions for the protection from paint spattering and droppings on all adjacent surfaces.

Contractor shall furnish, hang, or spread and maintain in all areas where painting or finishing work is being carried on, and shall remove upon completion of its work, all necessary drop cloths, tarpaulins and other means of protecting its work, either installed or in process of installation.

Tarpaulins shall be hung over all openings to spaces being painted or finished, which are not otherwise enclosed, and which are subject to excessive dust conditions due to adjacent operations of other trades.

All paint, varnish, enamel, oil, turpentine, or other combustible or inflammable materials within the building shall be stored in noncombustible receptacles provided with tight covers, each night or after each work period. All such receptacles shall be tightly closed. All oily or paint saturated cloths, rags or waste shall be removed from the building after each day's work or other work period. No inflammable or combustible material of any kind shall be left unenclosed while inside the building.

Contractor shall protect all nameplates on all equipment by masking prior to painting. It shall also protect adjacent surfaces whenever they do not require painting.

## 4.0 INSTALLATION

### 4.1 Surfaces Not to be Painted

The following surfaces shall not be painted:

4.1.1 Aluminum siding, fascias, etc.

.2 Stainless steel, copper, brass, bronze, chrome, glass

.3 Aluminum thresholds

.4 Finish hardware and accessories

.5 Light fixtures and hangers

.6 Interior of Ion Exchangers and Decarbonator

.7 Prefinished pipes and aluminum-jacketed insulated pipes.

#### 4.2 Surface Preparation

##### 4.2.1 Shop Work

4.2.1.1 Surfaces to be painted shall first be cleansed of oil, grease, dirt, and salts by methods described in Specification SSPC-SPI-63, Solvent Cleaning.

4.2.1.2 Dirt, rust scale, loose rust, mill scale, welding flux, slag, and splatter, and other detrimental foreign matter shall be removed by either of the following methods as indicated in Table 1 - Shop Painting.

a. Near-White Blast Cleaning to Specification SSPC-SP10-63

b. Commercial Blast Cleaning to Specification SSPC-SP6-63.

4.2.1.3 The anchor pattern (surface profile) of the blasted steel shall not exceed 2 mils.

4.2.1.4 Surfaces cleaned by sand blasting shall be primed as soon as practicable, but no later than the end of the same working day, and before any visible rusting occurs.

##### 4.2.2 Field Work

4.2.2.1 All provisions of Article 3.1 above shall be applicable to surfaces to be painted in the field.

4.2.2.2 Concrete and masonry surfaces shall be brushed free of dust, dirt and other foreign matter and be completely dry prior to coating. Concrete surfaces having a glazed appearance, such as produced by steel trowelling, shall be etched with a 10% solution of hydrochloric acid, followed by water rinsing. Surfaces which have pits or voids shall be grouted with a suitable mortar.

4.2.2.3 All galvanized steel to be painted shall be solvent cleaned per Specification SSPC-SP1-63 and then pretreated with one coat of ENDCOR(R) 400 Low Flash Wash Primer.

4.2.2.4 Before application of field finish coat, equipment painted with a Manufacturer's Standard Finish shall be cleaned free of dust, dirt, grease, etc. Glossy surfaces which may detrimentally affect adhesion of the finish coat shall be treated by mild surface abrasion, or solvent wash before painting.

### 4.3 COATING APPLICATION

#### 4.3.1 General Provisions

4.3.1.1 Coatings may be applied by brush, roller, or air or airless spraying, or a combination of these methods.

4.3.1.2 Brass, copper, nickel, galvanized, aluminum, and stainless steel equipment shall not be painted unless specified otherwise.

4.3.1.3 Primers shall be applied to a minimum dry film thickness of 1.5 to 2.0 mils, unless specified otherwise.

4.3.1.4 Ample drying or cure time shall be allowed for any coat before application of the succeeding coat, as prescribed by the coating manufacturer.

4.3.1.5 Thickness of all coats shall be in accordance with Table 3 - Coating System Briefs or manufacturer's recommendations, whichever is greater.

#### 4.3.2 Shop Work

4.3.2.1 Unless otherwise specified, all fabricated steel



shall be coated with at least one coat of primer as indicated in Table 1 - Shop Painting.

4.3.2.2 Primers shall be applied before any damage occurs to the surface due to weather or other exposure.

4.3.2.3 Shop welds and areas within two inches of such welds shall be cleaned before painting by methods described in Article 3.1.2 above, or by Power Tool Cleaning to Specification SSPC-SP3-63.

#### 4.3.3 Field Work

4.3.3.1 Equipment which has been shop prime coated shall be touched up with the same primer as the shop prime coat. Touch-up shall include removal of loosely bonded paint and thorough cleaning of damaged areas, field connections and welds by cleaning methods described in Paragraph 4.3.2.3 above. Edges of breaks shall be feathered and the designated number of prime coats applied.

4.3.3.2 Surfaces which have not been shop primed shall be cleaned in accordance with provisions of Paragraphs 4.2.1 and 4.2.2.

4.3.3.3 Apply one coat of primer in accordance with Table 2 - Field Painting.

4.3.3.4 Apply finish coats in accordance with Table 2 - Field Painting.

#### 4.3.4 Piping and Equipment

Contractor shall paint all ferrous pipe hangers and valves, also electric conduit and hangers. Fabric-covered insulated exposed pipe and equipment shall be painted following the procedure hereinbefore specified. Exposed uninsulated prime painted equipment, not field finished by Supplier shall be finish painted by Contractor.

#### 4.3.5 Pipe Identification and Safety Color Coding

Pipe identification and safety color coding shall be in accordance with the American National Standard Institute "Safety Color Coding System." Contractor shall correlate with the cognizant trades regarding this work effort.

#### 4.3.6 Ion Exchangers and Decarbonator

Installation of rubber liners shall follow the following procedure.

- .1 Blast surfaces to be lined down to white metal with abrasive (sand, grit or metal shot) and clean away all excess blasting grit or shot.
- .2 on the same day as blasting, apply one coat of metal primer allowing adequate drying time.
- .3 Apply adhesive to metal surface in multiple coats (2 or 3 as required), allowing a 2 hour minimum drying time for each coat.
- .4 Apply adhesive to unvulcanized rubber sheet and apply sheet to metal surface. Seams are to be lap joints with approximately 1-1/2' of overlap.

Material used shall be flexible hard chemical sheet rubber; an acid, heat and abrasion resistant natural rubber compound with physical properties not inferior to the following:

Hardness - - - 90 + 5 shore durometer "A" (after cure)

Specific Gravity - - 1.26

The thickness of material shall be a minimum of 3/16".

- .5 Curing shall be done as follows depending on the physical dimensions of the unit being lined:
  - a. Vulcanize (steam cure) under pressure in steam autoclave.
  - b. Seal all vessel opening and inject low pressure steam to cure, maintaining 10-15 psig pressure in unit being vulcanized.
- .6 Quality Inspection checks:
  - a. Visual inspection for workmanship, conformance to detail drawings and obvious defects such as blisters, cracking or crazing.

- b. Spark test - 15,000 volts for leaks, voids or breaks.
- c. Clean vessel, removing all scraps of lining and blasting grit. (Including unlined compartments) replace covers and shipping flanges and prepare for shipment.
- d. Check hardness to confirm it falls within limits given in Note 4.

## 5.0 TESTING AND INSPECTION

Inspection will be performed by an inspector authorized by the Consulting Engineer or owner's representative.

All cleaning and preparation of surfaces to be painted is subject to inspection before painting is begun.

All prime coats shall be inspected before application of finish coats.

The film thickness of each coat shall be checked by each of the following methods:

- a. Immediately after application, wet film thickness readings shall be taken with a wet film thickness gauge.
- b. After curing, dry film thickness of each coat shall be measured by means of a properly calibrated MIKROTEST or ELCOMETER Paint Thickness Gauge

Defective work shall be corrected by the Painting SubContractor at his sole expense.

## 6.0 INFORMATION TO BE SUBMITTED

The following information and data shall be submitted 30 days after award of contract.

### 6.1 Samples

Contractor shall submit a pint container of all paint types specified. Samples shall show designated name, formula or specification number, batch number, color, manufacturer's directions for use and name of manufacturer.

PROTECTIVE COATING SPECIFICATION

TABLE 1 - SHOP PAINTING

<u>EQUIPMENT OR MATERIAL</u>	<u>SURFACE PREPARATION</u>	<u>PRIME COAT(S)</u>	<u>SPECIAL INSTRUCTIONS</u>
1. Columns, Heat Exchangers, Pressure Vessels, Fired Heaters, incl. Stacks & Breaching			
1.1 Insulated	None	None	
1.2 Uninsulated			
a. to 200° F.	None	None	To be field painted
b. 201° to 450° F.	Sand Blast,SSPC-SP6	THURMALOX 210	
c. 451° to 1000° F.	Sand Blast,SSPC-SP10	THURMALOX 245	
2. Water Treatment Equipment - Shop Fabricated; incl. Ion Exchangers, Filters, Aerators, Chemical Precipitators, etc.:			
2.1 Exterior Surfaces	Sand Blast,SSPC-SP6	ENDCOR 550	
2.2 Interior Surfaces - Submerged	Sand Blast,SSPC-SP6	ENDCOR 750	Std. procedure is to rub-ber line ion exchanger.
3. Tanks - Water Storage, Coagulator, Settling Basins:			
3.1 Exterior Surfaces	None	None	To be field painted
3.2 Interior Surfaces	None	None	To be field painted
4. Pumps and Compressors:	Mfr's. Std. Finish		Final finish coat to be applied in the field
5. Instruments and Control Panels:	Mfr's. Std. Finish		Final finish coat to be applied in the field.
6. Piping			
6.1 Pipe & Fittings	None	None	
6.2 Valves	Mfr's. Std. Finish		
7. Electrical Equipment	Mfr's. Std. Finish		
8. Structural and Base Steel, Walkways, Grating, Ladders, Platforms, Hand Rails:			
	None	None	None

PROTECTIVE COATING SPECIFICATION

TABLE 2 - FIELD PAINTING

EQUIPMENT OR MATERIAL	SURFACE PREPARATION	PRIME COAT(S)	INTERMEDIATE		FINISH COAT
			COAT	COAT	
1. Columns, Heat Exchangers, Pressure Vessels, Fired Heaters, incl. Stacks & Breeching:			None		
1.1 Insulated	None	None	None		
1.2 Uninsulated			None		
a. to 200°F.	Sand Blast SSPC-SP6.	ENDCOR 550	ENDCOR 601 Gray.	ENDCOR 600	Series - Color to suit.
b. 201° to 450°F.	Sand Blast SSPC-SP6.	THURMALOX 210 (or touch-up).	None	THURMALOX	THURMALOX
c. 451° to 1000°F.	Sand Blast SSPC-SP10.	THURMALOX 245 (or touch-up).	None	THURMALOX	204 Alum. THURMALOX 280 Alum.
2. Water Treatment Equipment - Shop Fabricated; incl. Ion Exchangers, Filters, Aerators, Chemical Precipitators, etc.:					
2.1 Exterior Surfaces	None	ENDCOR 550 (or touch-up).	ENDCOR 601 Gray.	ENDCOR 600	Series - Color to suit.
2.2 Interior Surfaces	None	ENDCOR 750 (or touch-up).	ENDCOR 775 Dark Red.	ENDCOR 772	Color to suit. Black.
3. Tanks - Water Storage, Coagulator, Settling Basins:					
3.1 Exterior Surfaces	Sand Blast	ENDCOR 550 (or touch-up).	ENDCOR 601 Gray.	ENDCOR 600	Series - Color to suit.
3.2 Interior Surfaces	Sand Blast SSPC-SP6.	ENDCOR 750	ENDCOR 775 Dark Red.	ENDCOR 772	Black.
3.2.1 Treated Water Tank Only	Sand Blast SSPC-SP6.	ENDCOR 801	None	ENDCOR 801	
4. Pumps and Compressors	None	None	None	ENDCOR 601	Gray. Touch-up
5. Instruments and Control Panels	None	None	None	Mfr's. Std.	Finish.

TABLE 2 - FIELD PAINTING (Continued)

<u>EQUIPMENT OR MATERIAL</u>	<u>SURFACE PREPARATION</u>	<u>PRIME COAT(S)</u>	<u>INTERMEDIATE COAT</u>	<u>FINISH COAT</u>
6. Piping, incl. Valves				
6.1 Insulated	None	None	None	None
6.2 Uninsulated	Sand Blast SSPC-SP6.	ENDCOR 550	ENDCOR 601 Gray.	ENDCOR 600 Series - Color to suit.
7. Electrical Equipment	None	None	None	Touch-up Mfr's. Std. Finish
8. Structural and Base Steel, Walkways, Grating, Ladders, Platforms, Hand Rails:				
	Sand Blast SSPC-SP6.	ENDCOR 550	ENDCOR 601 Gray.	ENDCOR 600 Series - Color to suit.
9. Concrete and Masonry - incl. Sumps, Pump Bases, etc.:				
9.1 Above Grade	Brush Blast, SSPC- SP7 or acid etch.	ENDCOR 601 Gray.	None	ENDCOR 6711 Dark Gray.
9.2 To be buried	Brush Blast, SSPC- SP7 or acid etch.	ENDCOR 750	ENDCOR 775 Dark Red.	ENDCOR 772 Black.

PROTECTIVE COATING SPECIFICATION  
TABLE 3 - COATING SYSTEM BRIEFS

SYSTEM NO.	TYPE	BASE SERVICE	C O A T I N G S			THEORETICAL COVERAGE SQ. FT. PER GAL.	
			Color	DRY FILM MILS PER COAT	WET FILM MILS PER COAT		
I	Silicone	Medium Heat Resistant	THURMALOX 210	Primer	1 - 1.5	3.5 - 4.5	400
			THURMALOX 204	Aluminum	1	3.5 - 4.5	400
			THURMALOX 245	Primer	1 - 1.2	2 - 3	400
III	Tar Epoxy - Polyamide Cured	Process Equip. & Tank Interiors; Buried Structure Exteriors	THURMALOX 280	Aluminum	1 - 1.2	2 - 3	500
			ENDCOR 750	Primer	1.5 - 2	4 - 5	320
IV	Chlorinated Rubber	Tank, Structural, Piping, Exteriors	ENDCOR 775	Dark Red	8	10 - 12	150
			ENDCOR 772	Black	8	10 - 12	150
V	Chlorinated Rubber	Concrete & Masonry High Build	ENDCOR 550	Primer	1.5 - 2	4 - 5	375
			ENDCOR 601	Gray	2	6 - 7	240
VI	Phenolic-Zinc Dust	Potable Water Tank Interiors	ENDCOR 600	To suit	2	6 - 7	240
			ENDCOR 600	White	2	6 - 7	240
VII	Epoxy - Polyamide	Pipe Lining	ENDCOR 6711	Dark Gray	4	10 - 12	140
			ENDCOR 801	Gray	1.5 - 2.0	4 - 5	375
VIII	Epoxy - Polyamide	Pipe Lining	ENDCOR 801	Gray	1.5 - 2.0	4 - 5	375
			ENDCOR 745	Oxide Red	2 min.	4 - 5	400
IX	Epoxy - Polyamide	Pipe Lining	ENDCOR 745	Oxide Red	2 min.	4 - 5	400
			ENDCOR 745	Oxide Red	2 min.	4 - 5	400

NOTES: 1. Color of final finish coat to be selected by Engineer, but should contrast in color with previous coat.