Division 09

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SECTION 092210
NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Non-load-bearing steel framing systems for interior gypsum board assemblies.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 FRAMING SYSTEMS

A. Framing Members, General: Comply with ASTM C 754 for conditions indicated.

1. Steel Sheet Components: Comply with ASTM C 645 requirements for metal unless otherwise indicated.
2. Protective Coating: ASTM A 653/A 653M, G40 (Z120), hot-dip galvanized, unless otherwise indicated.

B. Studs and Runners: ASTM C 645.

1. Steel Studs and Runners:
   a. Minimum Base-Metal Thickness: 0.0296 inch, 20 ga. (0.752 mm).
   b. Depth: As scheduled on Drawings for each location.

C. Slip-Type Head Joints: Provide one of the following:

1. Single Long-Leg Runner System: ASTM C 645 top runner with 2-inch- (51-mm-) deep flanges in thickness not less than indicated for studs, installed with studs friction fit into top runner and with continuous cold rolled channel bridging attached to each stud located within 12 inches (305 mm) of the top of studs to provide lateral bracing.
2. Double-Runner System: ASTM C 645 top runners, inside runner with 2-inch- (51-mm-) deep flanges in thickness not less than indicated for studs and fastened to studs, and outer runner sized to friction fit inside runner.
3. Deflection Track: Steel sheet top runner manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.
   a. Products: Subject to compliance with requirements, provide one of the following:
      1) ClarkDietrich; MaxTrak Slotted Deflection Track
      2) Steel Network Inc. (The); VertiClip SLD Series.
      3) Telling Industries; True-Action™ Slotted Track.

D. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.

1. Minimum Base-Metal Thickness: 0.033 inch, 20 ga. (0.84 mm).

E. Cold-Rolled Channel Bridging and Bracing: Steel, 0.053-inch (1.34-mm) minimum base-metal thickness, with minimum 1/2-inch- (13-mm-) wide flanges.

1. Depth: 1-1/2 inches (38 mm) unless otherwise indicated.
2. Clip Angle: Not less than 1-1/2 by 1-1/2 inches (38 by 38 mm), 0.068-inch- (1.72-mm-) thick, galvanized steel.

2.2 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards.

1. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

B. Isolation Strip at Exterior Walls: Provide one of the following:

1. Asphalt-Saturated Organic Felt: ASTM D 226, Type I (No. 15 asphalt felt), nonperforated.
2. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8 inch (3.2 mm) thick, in width to suit steel stud size.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Installation Standard: ASTM C 754, except comply with framing sizes and spacing indicated.

1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.

B. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.

C. Install bracing at terminations in assemblies.

D. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

E. Cutting, Notching and Boring Holes in Nonstructural Steel Wall Framing:

1. Flanges and lips of nonstructural steel wall studs shall not be cut or notched.
2. Holes in webs of nonstructural steel wall studs shall be permitted along the centerline of the web of the framing member, shall not exceed 1-1/2 inches (38 mm) in width or 4 inches (102 mm) in length, and the holes shall not be spaced less than 24 inches (610 mm) center to center from another hole or less than 10 inches (254 mm) from the bearing end.

3.3 INSTALLING FRAMED ASSEMBLIES

A. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.

B. Install studs so flanges within framing system point in same direction.

1. Space studs at 16 inches (406 mm) o.c. unless otherwise indicated.

C. Install tracks (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts penetrating partitions above ceiling.

1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.
   a. Install two studs at each jamb unless otherwise indicated.
   b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch (13-mm) clearance from jamb stud to allow for installation of control joint in finished assembly.
   c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.

3. Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.

D. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch (3 mm) from the plane formed by faces of adjacent framing.

END OF SECTION 092216

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SECTION 099000
CONSTRUCTION AND RESTORATION PAINTING

PART 1 GENERAL

1.01 DEFINITIONS

A. The word “paint” in this Section refers to substrate cleaners, fillers, sealers, primers, undercoats, enamels and other first, intermediate, last or finish coatings.

B. The word “primer” in this Section refers to substrate cleaners, fillers, sealers, undercoats, and other first or intermediate coats beneath the last or finish coating.

C. The words “finish paint” in this Section refer to the last or final coat and previous coats of the same material or product directly beneath the last or final coat.

D. Finish Paint Systems: Finish paint and primers applied over the same substrate shall be considered a paint system of products manufactured or recommended by the finish coat manufacturer.
   1. Finish paint products shall meet or exceed specified minimum physical properties.

E. Without limiting the general aspects of other requirements of these specifications, all surface preparation, coating and painting of interior and exterior surfaces shall conform to the applicable requirements of the Steel Structures Painting Council, ASTM, current Local and Federal Health Standards, and the coating/paint manufacturer's printed instructions.

1.02 SUBMITTALS

A. Painting Schedule: **Contractor shall submit a** Painting Schedule listing all exterior and interior substrates to be painted and specified finish paint type designation; product name and manufacturer, recommended primers and product numbers, and finish paint color designation for each substrate to be painted.
   1. Designate exterior substrates by building name and number, substrate to be painted and surface location.
   2. Designate interior substrates by building name and number, floor, room name and number, and surface to be painted.

B. Product Data Sheets: Manufacturer’s published product data sheets describing the following for each finish paint product to be applied:
   1. Percent solids by weight and volume, solvent, vehicle, weight per gallon, ASTM D 523 gloss/reflectance angle, recommended wet and dry film thickness, volatile organic compound (VOC) content in lbs/gallon, product use limitations and environmental restrictions, substrate surface preparation methods, directions and precautions for mixing and thinning, recommended application methods, square foot area coverage per gallon, storage instructions, and shelf-life expiration date.
   2. Manufacturer’s recommended primer for each finish paint product and substrate to be painted.
   3. Manufacturer’s complete range of available colors for each finish paint product to be applied.

C. Finish Paint Type Samples: Two finish paint samples applied over recommended primers for each substrate to be painted.
   1. Samples shall be in the designated color and specified ASTM D 523 reflectance.
   2. Label each sample with the following information:
      a. Project number and Painting Schedule designation describing substrates and locations represented by the sample.
      b. Finish paint and primer manufacturer, product names and numbers, finish paint color and reflectance.
   3. Leave a 1 inch wide exposed strip of unpainted substrate and each coat of primer and finish paint.
   4. Sample Sizes:
      a. Sheet Metals: 4 inch by 8 inch flat sheets.
      b. Bar and Tubular Metals: 8 inch long bars or tubular stock.
   5. Steel Primer and Finish Coat Samples
      1. Self-Primer: 1 quart, each type specified.
      2. Finish Coat: 1 quart, each type specified

D. Quality Control Submittals:
   1. Test Reports: Furnish certified test results from an independent testing laboratory, showing that products submitted comply with the specifications, when requested by the Director's Representative
   2. Certificates: Furnish certificates of compliance required under QUALITY ASSURANCE Article.

1.03 QUALITY ASSURANCE

A. Volatile Organic Compounds (VOCs) Regulatory Requirements: Chapter III of Title 6 of the official compilation of Codes, Rules and Regulations of the State of New York (Title 6 NYCRR), Part 205 Architectural Surface Coatings.
   1. Certificate of Compliance: List of each paint product to be delivered and installed. List shall include written certification stating that each paint product listed complies with the VOC regulatory requirements in effect at the time of job site delivery and installation.

B. Provide materials for each system type from a single manufacturer.

C. Container Labels: Label each product container with paint manufacturer's name, product name and number, color name and number, thinning and application instructions, date of manufacture, shelf-life expiration date, required surface preparations, recommended coverage per gallon, wet and dry film thickness, drying time, and clean up procedures.

D. Field Examples:
   1. Field examples to be applied on actual substrates to be painted and shall duplicate earlier approved paint samples.
      a. Interior paint examples shall be applied in rooms with the same product intended for use.

b. Field Example Minimum Wet and Dry Film Thickness: As indicated on approved product data sheet.
c. Application: Apply each coat in a smooth uniform wet mil thickness without brush marks, laps, holidays, runs, stains, cloudiness, discolorations and other surface imperfections.
1) Leave a specified exposed width of each previous coat beneath each subsequent coat of finish paint and primer.
d. Use of Field Examples: Field examples shall serve as a quality control standard for acceptance or rejection of painting Work to be done under this Section.

2. Field Example Sizes:
a. Floor, Ceiling and Wall Examples: 100 square feet with 1 foot wide strips
b. Door and Frame Example: One door and Frame with 12" wide strips
c. Linear Substrate Examples: 20 lineal feet with 12 inch long strips.

3. Do not begin applying paints represented by field examples until examples have been reviewed and approved by the Engineer.
a. Protect and maintain approved field examples until all painting work represented by the example has been completed and approved.

D. Compatibility of Paint Materials: Primers and intermediate paints shall be products manufactured or recommended by the finish paint manufacturer.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials to the Site in original, unopened containers and cartons bearing manufacturer's printed labels. Do not deliver products which have exceeded their shelf life, are in open or damaged containers or cartons, or are not properly labeled as specified. Materials exceeding storage life recommended by the manufacturer shall be rejected.

B. Storage and Handling: Store products in a dry, well ventilated area in accordance with manufacturer's published product data sheets. Storage location shall have an ambient air temperature between 45 degrees F and 90 degrees F.

1.05 PROJECT CONDITIONS

A. Environmental Requirements:
1. Ambient Air Temperature, Relative Humidity, Ventilation, and Surface Temperature: Comply with paint manufacturer's published product data sheet or other printed product instructions.
2. If paint manufacturer does not provide environmental requirements, use the following:
a. Ambient Air Temperature: Between 45 degrees F and .75 degrees F.
b. Relative Humidity: Below 75 percent.

c. Ventilation: Maintain the painting environment free from fumes and odors throughout the Work of this Section.
d. Surface Temperature: At least 5 degrees F above the surface dew point temperature.

3. Maintain environmental requirements throughout the drying period.

B. The following items are not to be field painted unless otherwise specified, noted or directed:
1. Stainless steel, chrome plated surfaces, brass copper or aluminum.
2. Piping or ductwork to be insulated.
3. Steel to be cast in concrete
4. Uninsulated mechanical equipment with factory applied finish.
5. Unexposed galvanized items
6. Top flanges of structural beams and girders in composite concrete-steel construction

C. In locations where flammable vapors may be present, take positive action to prevent ignition by eliminating and controlling sources of ignition.
1. Sources of ignition may include open flames, lightning, smoking, cutting and welding, hot surfaces, frictional heat, sparks (static, electrical and mechanical), spontaneous ignition, chemical and physical-chemical reactions, and radiant heat.

D. Provide mechanical ventilation adequate to remove flammable vapors to a safe location and to confine and control combustible residues so that life or property is not endangered.
1. Equipment used to control hazardous exposure shall be explosion-proof.
2. Keep mechanical ventilation in operation at all times while coating or painting operations are being conducted and for a sufficient time thereafter to allow flammable vapors from drying coatings or paints to be exhausted. Ventilation shall reduce the concentration of air contaminant to the degree a hazard does not exist. The exhaust discharge point of fumes shall be not less than ten feet from any combustible exterior wall or roof nor shall the discharge be in the direction of any combustible construction or unprotected opening in any non-combustible exterior wall within 50 feet.

E. Provide adequate illumination while work is in progress, including explosion-proof lights and electrical equipment.
1. Whenever required by the Director's Representative, provide additional illumination and necessary supports to cover all areas to be inspected.
2. The level of illumination for inspection purposes shall be determined by the Director's Representative.

F. Comply fully with the manufacturer's recommendations as to environmental conditions under which the coating and coating systems can be applied

1.06 SAFETY AND HEALTH REQUIREMENTS

A. Provide and require use of personnel protective equipment for persons working in or about the project Site, all in accordance with requirements set forth by regulatory agencies applicable to the construction industry, the coating

manufacturer's printed instructions, and appropriate technical bulletins and manuals.

1. Protective helmets shall be worn by all persons while in the vicinity of the Work.
2. Workers engaged in or near the Work during abrasive blasting shall wear eye and face protection devices, and air purifying half mask or mouthpiece respirator with appropriate filter.
3. Furnish protective clothing, gloves and barrier creams in accordance with the coating manufacturer's recommendations to prevent injury to workmen from strong chemicals during their application.

PART 2 PRODUCTS

2.01 PAINT MANUFACTURERS

A. Where noted, the following finish paint manufacturers produce the paint types specified.
   1. Benjamin Moore and Co., 51 Chestnut Ridge Rd., Montvale, NJ 07645, (201) 573-9600.
   2. ICI Dulux Paints, 4000 Dupont Cr., Louisville, KY 40207, (800) 984-5444.
   3. PPG Architectural Finishes, One PPG Plaza, Pittsburgh, PA 15272, (800) 441-9695.
   4. Sherwin-Williams Co., Cleveland, OH 44101; 1-800-321-8194.
   5. Carboline Co., St. Louis MO. 63146; 1-800-848-4645

2.02 MISCELLANEOUS PRODUCTS

A. Cleaning Solvents: Low toxicity with flash point in excess of 100 degrees F.

B. Color Pigments: Pure, non-fading, finely ground pigments with at least 99 percent passing a 325 mesh sieve.
   1. Use lime-proof color pigments on masonry, concrete and plaster.
   2. Use exterior pigments in exterior paints.

C. Bedding Compound: Water based pre-mixed gypsum wallboard joint compound

D. Masking Tape: Removable paper or fiber tape, self-adhesive and nonstaining.

E. Metal Filler: Polyester resin base autobody filler.

F. Mineral Spirits: Low odor type recommended by finish paint manufacturer.

G. Paint Stripper: As recommended by finish paint manufacturer.

H. Stain Blocker, Primer-Sealer: As recommended by finish paint manufacturer.

I. Turpentine: ASTM D 13.

J. Spackling Compound: Water based pre-mixed plaster and gypsum wallboard finishing compound.

2.03 FINISH PAINT TYPES

A. Physical Properties:
1. Specified percent solids by weight and volume, pigment by weight, wet and dry film thickness per coat, and weight per gallon are minimum physical properties of acceptable materials.
a. Opaque Pigmented Paints: Physical properties specified are for white titanium dioxide base before color pigments are added.
b. Specified minimum wet and dry film thickness per coat are for determining acceptable finish paint products. Minimum wet and dry film thickness per coat to be applied shall comply with approved finish paint manufacturer's product data sheets.
2. Gloss or Reflectance: The following ASTM D 523 specified light levels and angles of reflectance:
a. Semi-gloss: Between 30 and 65 at 60 degrees.
b. Gloss: Over 65 at 60 degrees.

B. Exterior Finish Paint Types (Doors and Frames):
1. Paint Type GXL (Gloss Exterior Latex): Exterior Acrylic Latex, Gloss Enamel.
a. Solids by Weight: 40.0 percent.
b. Solids by Volume: 32.0 percent.
c. Solvent: Water.
d. Vehicle: 100 percent acrylic resin.
e. Weight Per Gallon: 10.0 lbs.
f. Wet Film Thickness: 3.4 mils.
g. Dry Film Thickness: 1.2 mils.
h. Manufacturers: Benjamin Moore, PPG, Sherwin- Williams, Carboline.

C. Interior Finish Paint Types (Walls & Ceilings):
1. Paint Type SGIL (Semi-gloss Interior Latex): Interior Acrylic Latex, Semi-gloss Enamel.
a. Solids by Weight: 49.0 percent.
b. Solids by Volume: 35.0 percent.
c. Solvent: Water.
d. Vehicle: Vinyl acrylic resin.
e. Weight Per Gallon: 10.0 lbs.
f. Wet Film Thickness: 3.8 mils.
g. Dry Film Thickness: 1.2 mils.
h. Manufacturers: Benjamin Moore, ICI Dulux, Sherwin-Williams Carboline

D. Colors: Provide paint colors shown on contract drawings or to be selected by the Director from finish paint manufacturers available color selections.
1. Approved finish paint manufacturers to match designated colors of other manufacturers where colors are shown on contract documents.

2.04 COATING SYSTEMS

A. Coating systems described below are to be used for concrete and masonry filler, and all structural steel priming and finish coats.

B. Type C-1 System: Block/Concrete Filler, Acrylic Intermediate and Finish Coats as follows:
   1. Filler: Acrylic resin designed for use on exterior and interior cast-in-place or precast concrete surfaces, 60 percent solids by volume.
   2. Intermediate and Finish Coats: Water reducible, 100 percent acrylic, 38 percent solids by volume.
   3. Acceptable Coating System: Heavy Duty Block Filler B42 W46, DTM Acrylic Intermediate and Finish Coating B66-200 by The Sherwin-Williams Company

C. Type C-2 System: Structural Steel Primer and Finish Coat - Self Priming, two component polyamide epoxy, 86% solids by volume.
   1. Acceptable Coating system: Carbomastic 94 Self-Priming and Finish Coating by Carboline Company. SSPC SP2 and SP3 are acceptable preparation methods for the above system.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine surfaces to be prepared, primed, or painted for compliance with contract documents, required environmental conditions, manufacturer's product data sheets, product label instructions and other written requirements.
   1. Do not begin any phase of the work without first checking and verifying that surfaces and environmental conditions are acceptable for such work and that any earlier phase deficiencies and discrepancies have been properly corrected.
      a. The commencement of new work shall be interpreted to mean acceptance of surfaces to be affected.

3.02 PREPARATION

A. Protection: Cover and protect surfaces to be painted, adjacent surfaces not to be painted, and removed furnishings and equipment from existing paint removals, airborne sanding particles, cleaning fluids and paint spills using suitable drop cloths, barriers and other protective devices.
   1. Adjacent exterior surface protections include roofs, walls, landscaping, driveways and walkways. Interior protections include floors, walls, furniture, furnishings and electronic equipment.
   2. Remove and replace removable hardware, lighting fixtures, telephone equipment, and other devices and cover plates over concealed openings in substrates to be painted.

a. Cover and neatly mask permanently installed hardware, lighting fixtures, cover plates and other devices which cannot be removed and are not scheduled for painting.

3. Schedule and coordinate surface preparations so as not to interfere with work of other trades or allow airborne sanding dust particle to fall on freshly painted surfaces.
4. Provide adequate natural or mechanical ventilation to allow surfaces to be prepared and painted in accordance with product manufacturer's instructions and applicable regulations.
5. Provide and maintain "Wet Paint" signs, temporary barriers and other protective devices necessary to protect prepared and freshly painted surfaces from damages until Work has been accepted.

B. Clean and prepare surfaces to be painted in accordance with specifications, paint manufacturer's approved product data sheets and printed label instructions. In the event of conflicting instructions or directions, the more stringent requirements shall apply.

1. Cleaners: Use only approved products manufactured or recommended by finish paint manufacturer. Unless otherwise recommended by cleaner manufacturer, thoroughly rinse with clean water to remove surface contaminants and cleaner residue.

C. Surfaces:

1. Existing Painted Substrates: Thoroughly clean to remove dirt, soot, grease, mildew, chalkiness and stains using finish paint manufacturer's recommended cleaners.
   a. Remove loose, peeling, cracked and blistered paint by chipping, scraping, and sanding smooth with medium and fine sandpaper
   b. Fill surface holes and depressions with finish paint manufacturer's recommended filler and sand smooth to adjacent undisturbed edges.
   c. Touch-up bare spots on previously painted surfaces with finish paint manufacturer's recommended primer.
   d. Sand existing semi-gloss and gloss paint surfaces to a uniform smooth dull finish before painting.
   e. Fill and sand smooth existing paint surface damages, depressions, ridges and other imperfections that will remain visible after new paints have been applied.
2. Steel Doors and Frames: Fill indentations and cracks with metal filler; sand smooth to match adjacent undamaged surfaces
3. Steel Substrates:
   a. Prepare steel in accordance with Structural Steel Painting Council (SSPC) standards:

      1) SSPC-SP1: Remove oil, grease, dirt, soil, salts, and other surface contaminants using appropriate cleaning solvents and clean rags, vapor, alkali, emulsion, or steam and adequate ventilation.

2) SSPC-SP2: Remove loose rust, mill scale, and paint to the degree specified by hand chipping, scraping, sanding, and wire-brushing.

3) SSPC-SP3: Remove loose rust, mill scale, and paint to the degree specified by power-tool chipping, descaling, sanding, wire-brushing, and grinding.

4) SSPC-SP5: Remove all visible rust, mill scale, paint, and foreign matter by white-metal blast cleaning with wheel or nozzle (dry or wet) using sand, grit, or shot.

5) SSPC-SP6: Remove all visible rust, mill scale, paint, and foreign matter by commercial blast cleaning until at least two-thirds of each element of the surface is free of all visible residues.

6) SSPC-SP10: Near white blast cleaning for heat resistant paints.

4. Galvanized Metal:
   a. Allow new galvanized surfaces to weather as long as possible before cleaning. Remove surface contaminants using clean rags and petroleum spirits.
   b. Remove “white rust” using appropriate solvent and, if necessary, wire brushing or sanding.
   c. Use appropriate Structural Steel Painting Council Standard SSPC-SP1 to SSPC-SP6 to prepare steel substrates where galvanized protection has been removed.
5. Gypsum Wallboard:
   a. Fill cracks, holes, and other indentations smooth to adjacent surfaces using specified bedding, spackling, and finishing compounds.
   b. Gypsum Wallboard: Fill and sand smooth minor bedding and finishing compound defects.
   c. Vacuum and wipe surfaces free of all sanding residue and dust.
6. Other Substrates: See finish paint manufacturer’s recommendations.

D. Painting Material Preparations:
1. Prepare painting materials in accordance with manufacturer’s approved product data sheets and printed label instructions.
   a. Stir materials before and during application for a consistent mixture of density. Remove container surface paint films before stirring and mixing.
   b. Slightly tint first opaque finish coat where primer and finish coats are the same color.
   c. Do not thin paints unless allowed and directed to do so in writing within limits stated on approved product data sheets.

3.03 PAINTING SCHEDULE

A. Interior Walls: Unless otherwise specified, apply the following paint types with manufacturer's recommended primers on the following interior substrates:
   1. Paint Type SGIL (Semi-Gloss Interior Latex): **Refer** to **approved** Schedule **submittal** for all locations.

B. Doors and Frames: Unless otherwise specified, apply the following paint types with manufacturer's recommended primers on the following substrates:
   1. Paint Type GXL (Gloss Exterior Latex): **Refer to approved** Schedule **submittal** for all door and frame locations

C. Existing Structural Steel: Unless otherwise specified, apply the following paint types with manufacturer's recommended primers on the following substrates:
   1. Coating System C-2: All deteriorating interior and exterior structural steel shall receive this coating system

3.04 APPLICATION

A. Environmental Conditions:
   1. Water-based Paints: Apply when surface temperatures will be 50 degrees Fahrenheit to 90 degrees Fahrenheit throughout the drying period.
   2. Other Paints: Apply when surface temperatures will be 45 degrees Fahrenheit to 95 degrees Fahrenheit throughout the drying period.
   3. Apply exterior paints during daylight hours free from rain, snow, fog and mist when ambient air conditions are more than 5 degrees above the surface dew point temperature and relative humidity less than 85 percent.
      a. When exterior painting is allowed or required during noonday light hours, provide portable outdoor weather recording station with constant printout showing hourly to diurnal air temperature, humidity, and dew point temperature.
   4. Exterior Cold Weather Protection: Provide heated enclosures necessary to maintain specified temperature and relative humidity conditions during paint application and drying periods.

B. Application: Apply approved paints where specified, or shown on the drawings, and to match approved field examples.
   1. Applicators: Brushes, rollers or spray equipment recommended by the paint manufacturer and appropriate for the location and surface area to be painted.
      a. Approved minimum wet and dry film thicknesses for each coat shall be as recommended on approved product data sheets and the same for each application method and substrate.

C. Paint Type Coats To Be Applied: Unless otherwise specified, or recommended by finish paint manufacturer's product data sheet and approved by submittal, the number of coats to be applied for each paint type are as follows:
   1. Acrylic Latex Paint Types GXL and SGIL:
      a. New Unpainted Surfaces: Apply 1 coat of primer and 2 coats of finish paint.
      b. Existing Painted Surfaces:
         1) Apply 2 coats of finish paint when existing paint has a lower gloss.

2) Apply one coat of primer and 2 finish coats when existing paint has a higher gloss.

c. Paint Type SGIL: Provide mildewcide additive for bathrooms, kitchens, janitor closets, laundry rooms, restrooms and other wet or damp areas.

2. Block Filler, Steel Primer, Steel Finish Coats
   a. Pitted Concrete & Concrete Masonry Surfaces: Use block filler as primer/sealer where allowed by finish paint manufacturer.
   b. Existing Structural Steel:
      1) Primed Steel: Apply 2 coats of finish paint.
      2) Unprimed Steel: Apply 1 coat of Paint Type ESP or ISP, depending upon exterior or interior location.
         a) If top coated, apply additional coat of finish paint manufacturer's galvanized primer and 2 coats of finish paint.
3. Other Paint Types: Apply in accordance with paint manufacturer's product data sheets.

3.05 ADJUSTING AND CLEANING

A. Reinstall removed items after painting has been completed.
   1. Restore damaged items to a condition equal to or better than when removed. Replace damaged items that cannot be restored.

B. Touch up and restore damaged finish paints. Touch up and restoration paint coats are in addition to the number of specified finish paint coats.

C. Remove spilled, splashed, or spattered paint without marring, staining or damaging the surface. Restore damaged surfaces to the satisfaction of the Director's representative.

D. Remove temporary barriers, masking tape, and other protective coverings upon completion of painting, cleaning and restoration work.

END OF SECTION

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SECTION 099100
PIPE AND EQUIPMENT PAINTING

PART 1 GENERAL

1.1 DESCRIPTION

A. Work included
   1. Furnish all painting materials and equipment and perform all labor necessary to provide a finished and completely acceptable painting/finishing job for the pipe and mechanical equipment.
   2. Conduct work in accordance with all applicable regulations (e.g., OSHA).
   3. Remove and dispose of all materials resulting from the work in accordance with all applicable regulations.
   4. Provide markers, labels, tags, and signs for pipe and equipment.

1.2 QUALITY ASSURANCE

A. All painting materials shall remain in their original containers with manufacturers' label intact. The following information shall appear on all painting material labels:
   1. Manufacturer's name
   2. Product name and number
   3. Color
   4. Batch number
B. All painting work shall be done in strict accordance with the paint manufacturer's published instructions in concert with this section of the specifications. Where manufacturer's recommended materials, surface preparation, number of coats or mil thicknesses exceed those shown in the specifications, the recommendations of the manufacturer shall govern.
C. Field Quality Control
   Field painting shall be performed by an approved painting subcontractor Applicator shall be trained in application techniques and procedures of coating materials and shall demonstrate a minimum of 5 years successful experience in such applications as an industrial coatings applicator.
D. Maintain throughout the duration of the application a crew of painters that are fully qualified.
E. The Contractor shall coordinate the paint products to be used such that shop and field coats are compatible. The Contractor shall coordinate the use of coatings such that shop coatings and field coatings are supplied by the same manufacturer, and that shop and field coats are compatible.
F. The Contractor will warranty his workmanship for a period of one year from the date of completion. The Contractor will supply labor and material at no cost to the owner for the repair / touchup of any area where the newly applied coating has flaked or peeled.
G. The painting contractor must monitor the daily activities associated with the application of all materials. Accordingly, the Contractor will keep a daily log recording the following:
   1. Ambient conditions (relative humidity and dew point)
   2. Substrate temperatures
   3. Batch numbers of materials
   4. Mixing data-thinning
   5. Dry film thickness readings for each coat applied (before & after).
H. Reference Standards
   1. American Society for Testing and Materials
      a. ASTM D 2246, Freeze-Thaw Test
      b. ASTM D 2247, Humidity Test
      c. ASTM B 117, Salt Spray Test
      d. ASTM E 84, Surface Burning Characteristics Test
      e. ASTM D 16 Terminology relating to Paint, Varnish, Lacquer, and Related Products
      f. ASTM D 1005 Test for determining dry film thickness
   2. Federal Specification

a. TT-C-555B, Section 4.4.7 Wind Driven Rain Test
3. Steel Structures Painting Council
   a. Steel Structures Painting Manual, Volume 11, Systems & Specifications
4. The Society for Protective Coatings:
   a. SSPC-SP-1 Solvent Cleaning
   b. SSPC-SP-2 Hand Tool Cleaning
   c. SSPC-SP-3 Power Tool Cleaning

1.3 SUBMITTALS

A. The following items shall be submitted to the Engineer in accordance with the General Provisions:
   1. Paint Schedule - A comprehensive and complete schedule of surface preparations and paint systems shall be submitted. This schedule shall list all interior and exterior surfaces and all major equipment and piping to be painted by room, area or location. The schedule shall reflect the paint manufacturer's recommendations for the coating systems and shall contain certification that the manufacturer's representative has reviewed and approved the schedule. For each room or area to be painted the schedule shall present the following information in neat and tabular form:
      a. Location, room or area name (e.g., Blower Room, Primary Sludge Pump Room, etc.)
      b. All surfaces or items to be painted (e.g., pump, sludge discharge piping, etc.).
      c. Paint system identification per section 3.08 below
      d. Color for prime, intermediate and finish coats for all surfaces or items to be painted including manufacturers' alphanumeric code and generic name (e.g., AY 82 Arctic Ice).
      e. Notes, remarks or comments on any proposed deviations, special conditions, treatment or application requirements.
      f. Painting status at time of installation (e.g., bare steel, primed, etc.)
      g. The schedule shall also contain the name of the paint manufacturer and information on the manufacturer's representative who will coordinate and/or inspect the work including name, address and telephone number. The schedule shall be submitted as soon as possible following the award of the contract so that the approved schedule may be used to identify colors and to specify shop paint systems for fabricated equipment.
      h. Colors – for pipe and banding, as required – shall be as noted in the Piping Color and Label Schedule (Section 3.7) or other sections in this specification subject to final selection by the Engineer during review of submittals.
      i. Colors for building areas, equipment, etc. will be selected by the Engineer during review of the paint schedule. The Contractor shall submit chips with the paint schedule to aid in color selection. Color names and/or numbers will be identified according to the appropriate color chart issued by the manufacturer of the respective product.
   2. Manufacturer's technical data sheets for each paint/coating giving descriptive data, curing time, mixing, thinning and application instructions.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver materials in sealed containers with manufacturer's label intact.
B. Storage of Material
   1. Store materials in a protective area at a temperature between 40°F and 110°F, unless otherwise required by the product manufacturer.

1.5 JOB CONDITIONS

A. Apply coatings only under the following prevailing environmental conditions:
   1. Air and surface temperature are not below 50°F or above 110°F. Refer to specific product data sheets for minimum surface temperature requirements. Surface temperature shall be at least 5 degrees F above dew point and in a rising mode.
   2. Relative humidity is not greater than 85% and the surface temperature is at least 50°F above the dew point.
   3. The atmosphere is relatively free of airborne dust.
   4. Or as otherwise required by product manufacturers.

1.6 SAFETY AND HEALTH REQUIREMENTS

A. In accordance with requirements set forth by regulatory agencies applicable to the construction industry and the manufacturer's printed data sheets and appropriate technical bulletins and manuals, the Contractor shall instruct his employees in the proper use of all materials and protect his employees as required by OSHA.
B. Head, face, eye, and ear protection will be provided by the Contractor to his employees. Barrier creams shall be used to protect the workers skin.
C. All ladders and scaffolding must conform to the applicable safety requirements of OSHA.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Unless otherwise specified materials shall be products of the following manufacturer/supplier or equal:
   1. Tnemec Company, Inc. (paints and coating systems)
   2. Carboline
   3. Approved Equal

PART 3 EXECUTION

3.1 GENERAL PAINTING NOTES

A. All coatings specified herein for new equipment and materials are in addition to shop coating specified elsewhere.
B. Apply coatings with brush or roller, spray paint only with Engineer’s approval.
C. Coatings shall be free from imperfections; unacceptable work will be given additional coats, if required, at no additional costs to the Owner.
D. The Contractor shall provide all scaffolding, staging, etc., required to perform his work. Place scaffolding to avoid interference with others.
E. Damaged shop coatings shall be cleaned and retouched before any successive field painting is done.
F. Shop primers shall be compatible with finish coats specified.
G. New Caulking shall not be painted.
H. Application of field coating(s) to prepared surface/substrate will constitute Contractor’s acceptance of surface/substitute.
I. In areas scheduled to be finished, electrical conduit and miscellaneous piping, including piping by other Contracts, shall be painted to match adjacent ceilings and walls unless otherwise required by this specification or allowed by the Owner.
J. Painted surfaces shall be fully finished and cured prior to installation of insulating materials or signs.

K. Protection: The painting contractor must take the necessary precautions to protect the equipment / fixtures adjacent to the work area, which are not scheduled for painting.

3.2 SANDBLASTING

A. Sandblasting shall conform to the Steel Structures Painting Council's System and Specifications.
B. Proportions of sand, grit or shot shall be adjusted as necessary to produce a prepared surface equivalent of the approved sample.
C. Application of protective coatings shall be within 24 hours after blast cleaning. Surfaces showing any traces of rust shall be blasted again before application of protective coatings.
D. In areas where assemblies are scheduled to receive a sandblasted surface preparation and portions of the assembly have been previously coated, all prior coatings shall be removed by blast cleaning to the extent necessary for proper adhesion of the specified coating.
E. Work, including but not limited to sandblasting, painting, and disposal of work materials, shall be performed in accordance with all applicable regulations (e.g., OSHA 20 CFR 1926.62).

3.3 APPLICATION

A. Mix and thin materials in accordance with the manufacturer's printed instructions.
B. Apply materials at specified thickness by method recommended by the manufacturer.
C. Allow each coat to dry thoroughly before recoating.
D. Vary color slightly to indicate each successive coating.
E. Cut in edges clean and sharp where work joins other materials or colors.
F. Make finish coats smooth, uniform in color and free of brush marks, laps, runs and missed areas.

3.4 INSPECTION

A. Surface Cleanliness: Surface of abrasive blast-cleaned steel shall comply with the SSPC pictorial standards.
B. Surface Profile: The surface profile for ferrous metal scheduled to receive protective coatings shall be between 20 and 30% of the total dry film thickness for the completed system.

3.5 CLEANING

A. Remove paint spatters from finished areas.
B. Repair any damage to coatings or surfaces caused by cleaning operation.
C. Remove debris from job site and leave storage area clean.

3.6 SYSTEMS FOR PAINTING AND FINISHING

A. General
   1. System C – Applicable for Exterior Structural Steel and Miscellaneous Metal, and Bollards.
      Surface Preparation: SSPC-SP6 Commercial blast cleaning.
      Prime Coat: Tnemec Series 90-97 Zinc (shop Applied)2.5-3.5 mils DFT. Tnemec 901K97 is used for field touch-up.
      Intermediate Coat: Tnemec Series N69 Epoxoline @ 3.0-5.0 mils DFT.
      Finish Coat: Tnemec Series 1075U – (color)Endura Shield @ 2.0-3.0 mils DFT.
   2. System F – Applicable for New Interior Miscellaneous Metal and Structural Steel, Pumps and Motors, Ductile Iron and Steel Piping, Valves and Non-Stainless Steel Ferrous Appurtenances.
      Surface Preparation: SSPC-SP6 Commercial blast cleaning (if item not subject to immersion). SSPC-SP10 Near White Blast (if item is subject to immersion).
      Prime Coat: Tnemec Series 1 Primer (shop Applied) @ 2.0-3.0 Mils DFT.
      Intermediate Coat: Tnemec Series N69 (color) @ 4.0-5.0 mils DFT.
      Finish Coat: Tnemec Series N69 (color) @ 4.0-6.0 mils DFT.

3.7 PIPING COLOR AND LABEL SCHEDULE

A. All piping painting, banding and labeling shall be in accordance with the "Recommended Standards for Wastewater Facilities," published by the Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers. The following labels and colors shall be used, as applicable:

Piping Type and Label	Color
Raw Sludge	Brown with Black Band
Sludge Recirculation Suction	Brown with Yellow Bands
Sludge Draw Off	Brown with Orange Bands
Sludge Recirculation Discharge	Brown
Sludge Gas	Orange
Natural Gas	Orange with Black Bands
Non-Potable Water	Blue with Black Bands
Potable Water	Blue
Chlorine	Yellow
Sulfur Dioxide	Yellow with Red Bands
Sewage	Gray
Compressed Air	Green
Fuel Oil/Diesel	Red
Plumbing Drain/Vent	Black
Polymer	Purple

B. WASTE MANAGEMENT

1. General Requirements:
   a. Place materials defined as hazardous in designated containers.
   b. Return solvent and oil soaked rags for contaminant recovery and laundering or for proper disposal.
   c. Do not dispose of paints or solvents by pouring on ground. Place in designated containers for proper disposal per State and Federal regulations. A copy of the shipping manifest shall be provided to the Engineer.

END OF SECTION

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SECTION 099200
EPOXY FLOOR COATING

PART 1. GENERAL

1.01 SUMMARY

A. This section provides acceptable products and requirements for equipment to be installed with relation to a seamless, epoxy flooring system.

1.02 SUBMITTALS

A. Catalog cuts and shop drawings shall be submitted for approval for all equipment herein specified.
B. An Order Specification shall be included which shall describe in detail all materials provided and all equipment and tools required to complete the work.
C. The Contractor shall be responsible for clearing the proposed work area before beginning the work as permitted by the Owner. The Owner shall assist with instructions and temporary storage as necessary.

1.03 QUALITY ASSURANCE

A. Provide functional testing of all installed components in accordance with a schedule approved by the Engineer.

PART 2. PRODUCTS

2.01 ACCEPTABLE PROVIDER

A. C.A. Reed Associates, Inc. (800-462-6149), www.careed.com or equal.

B. Provider must be a ‘single-source’ company that has technical qualifications and facilities to manufacture and install specified system. Installation crew shall be employees of the ‘single-source’ company and no subcontractors shall be permitted.

C. Provider must have written safety program and liability and required workman's compensation insurance. Insurance certificates must be submitted prior to job start-up.

D. Provider must have at least ten (10) similar installations with this flooring system. Submit reference list with contact names, numbers, addresses, and size of project.

2.02 DESIGN CRITERIA

A. Epoxy Slurry System as manufactured by C.A. Reed Associates, Inc., or Equal

B. Final nominal thickness shall be 1/16” (62 mils).

C. Color and texture shall be selected from submitted samples.

2.03 PHYSICAL PROPERTIES:

Compressive Strength	ASTM D-695	11,000 psi
Hardness (Shore D)	ASTM D-2240	80
Tensile Strength	ASTM D-638	8,500 psi
Flexural Strength	ASTM C-790	8,000 psi
Bond Strength (Concrete)	ACI-403	350 psi (concrete fails)
Adhesion to Metal		2,500 psi2,500 psi
Impact Resistance	MIL D-3134F	16 ft./lb. (no cracking)
Indentation	MIL D-3134F	Withstands 2,000 lbs./sq.in. for 30 min. without indent
Abrasion Resistance	ASTM-C-501	35-40 mg
Elevated Temp Resistance	MIL-D-3134F	no slip or flow @ 158 F
Service Temperature	MIL-D-3134F	160F(immersion),185F(dry)
Water Absorption	ASTM D-670-63	0.10% maximum
Elongation	ASTM D-638	5.5%
Curing Time (@ 70F)		Light traffic 24 hrs Heavy traffic 48 hrs Ultimate Cure 7 days

PART 3. EXECUTION

3.01 DELIVERY AND STORAGE

A. Material must be delivered to job site in clean, clearly labeled containers and inspected by installer prior to start of job.

B. Material must be stored in a dry, enclosed area protected from the elements. Temperature of storage area must be kept between 60-90 degrees F.

3.02 ENVIRONMENTAL REQUIREMENTS

A. New concrete must be cured no less than 28 days under good conditions. Concrete subfloors on or below grade must be properly equipped with vapor barriers.

B. Water, heat and lighting shall be supplied by GC/Owner. Only 110V/single phase electricity shall be made available to Installer.

C. Work area shall be made free of other trades and traffic during and for a period of 48 hours after completion of floor.

3.03 PRODUCT PACKAGING

A. All materials used must be precision mixed on site with approved mix and measure apparatus

to ensure a timely, accurate mix ratio.

3.04 PREPARATION

A. Concrete preparation to be performed through the use of 15D Blastrac (vacuum shotblaster) running off of Installer's 60K generator (power required for Blastrac machine will not be supplied by GC/Owner) in order to yield a clean, profiled substrate. Sawtec "dust-free" diamond grinding shall be performed along all edges and areas where shotblasting machine is unable to reach.

B. All termination points, including doorways and trench drains, shall be "keyed-in" in order to provide smooth transitions.

C. All cracks, sawcuts, gouges and holes shall be filled with a C.A. Reed #5100/fumed silica mixture prior to flooring installation.

3.05 PRODUCT INSTALLATION

A. Floor installation must strictly adhere to Manufacturer/Installer’s current written instructions.

B. Apply primer coat of C.A. Reed #5100 Epoxy Primer with a squeegee and back-roll with a high-quality, non-shed roller at 150 - 200 sq.ft./gallon.

C. Apply intermediate coat of C.A. Reed #5100 Slurry Mix at 50 sq.ft. per gallon, allow to cure.

D. Apply topcoat of C.A. Reed #5200 at 150 sq.ft. per gallon, allow to cure. Incorporate desired texture into topcoat, consult C.A. Reed for details.

E. Moving joints shall be recut and filled with a flexible sealant approved by C.A. Reed Associates, Inc.

F. Allow to cure 24 hours for light foot traffic, 48 hours for heavy duty traffic (at 70 degrees F). Keep water, cleaning chemicals and other liquids/contaminants off floor for at least 48 hours.

3.06 WARRANTY

A. Manufacturer/Installer to submit a single-source, one (1) year warranty against defects in material and workmanship upon completion of installation.

END OF SECTION

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