JUNE 15, 2022
EAST HARTFORD MAINTENANCE FACILITY AND
SIGNS & MARKINGS FACILITY
FEDERAL AID PROJECT NO.: N/A
STATE PROJECT NO. 42-324
TOWN OF EAST HARTFORD

ADDENDUM NO. 3

This Addendum addresses the following questions and answers contained on the "CT DOT QUESTIONS AND ANSWERS WEBSITE FOR ADVERTISED CONSTRUCTION PROJECTS":

Question and Answer No. 41

SPECIAL PROVISIONS
REVISED SPECIAL PROVISIONS

The following CSI Special Provisions are hereby deleted in their entirety and replaced with the attached like-named Special Provisions:

- SECTION 051200 - STRUCTURAL STEEL FRAMING
- SECTION 052100 - STEEL JOIST FRAMING
- SECTION 055000 - METAL FABRICATIONS
- SECTION 099113 - EXTERIOR PAINTING
- SECTION 099123 - INTERIOR PAINTING

The Bid Proposal Form is not affected by these changes.

There will be no change in the number of calendar days due to this Addendum.

The foregoing is hereby made a part of the contract.

SECTION 051200 - STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 SUMMARY:

A. This Section includes the following:

1. Structural Steel (W Shapes, Hollow Structural Sections, Angles, Channels, Plates)
2. Non-Shrink Grout
3. High-Strength Bolts, Nuts and Washers
4. Shop Primer

B. Related CSI Sections include the following:

1. Division 05 Section 055000, "Metal Fabrications" for steel lintels or shelf angles not attached to structural-steel frame, miscellaneous steel fabrications and other metal items not defined as structural steel.
2. Division 09 painting Sections for surface preparation and priming requirements.

1.2 DEFINITIONS:

A. Structural Steel: Elements of structural-steel frame, as classified by AISC's "Code of Standard Practice for Steel Buildings and Bridges," that support design loads.

1.3 PERFORMANCE REQUIREMENTS:

A. Connections: Provide details of connections required by the Contract to be selected or completed by structural-steel fabricator to withstand ASD-service loads indicated and comply with other information and restrictions indicated.

1. Select and complete connections using schematic details indicated and AISC's "Manual of Steel Construction, Allowable Stress Design," Part 4.

B. Construction: Simple framing, partially restrained.

1.4 SUBMITTALS:

A. Submit the following in accordance with Form 818 Article 1.20-1.05.02 and NOTICE TO CONTRACTOR – SUBMITTALS.

B. Product Data: For each type of product indicated.

C. Shop Drawings: Show fabrication of structural-steel components.

1. Include details of cuts, connections, splices, camber, holes and other pertinent data.
2. Include embedment drawings.
3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length and type of each weld.
4. Indicate type, size and length of bolts, distinguishing between shop and field bolts. Identify pre-tensioned and slip-critical high-strength bolted connections.

D. Quality Assurance:

1. Fabricator's Quality Manual and Certificates.
2. Erector's Quality Manual and Certificates.
3. Welding certificates, procedures, and continuity logs.

E. Mill Test Reports: Signed by manufacturers certifying that the following products comply with requirements:

1. Structural Steel (W-Shapes, Hollow Structural Sections, Channels and Angles) including chemical and physical properties.
2. Bolts, nuts and washers including mechanical properties and chemical analysis.
3. Tension-control, high-strength bolt-nut-washer assemblies.
4. Anchor rods
5. Anchor Rods or Bolts in chemical-anchoring material
6. Shop primers.
7. Non-shrink grout.

F. Source quality-control test reports.

1.5 QUALITY ASSURANCE:

A. Fabricator Qualifications: A qualified fabricator who participates in the AISC Quality Certification Program and is an AISC-Certified Fabricator, Category Certified Buildings Fabricator (BU).

B. Shop-Painting Applicators: Qualified according to AISC's Sophisticated Paint Endorsement SPE P1 Sophisticated Paint Endorsement (Enclosed) or SSPC-QP 3, "Standard Procedure for Evaluating Qualifications of Shop Painting Applicators."

C. Erector Qualifications: A qualified installer who participates in the AISC Quality Certification Program and is an AISC-Certified Erector, Category Certified Erector Advanced (CSEA).

D. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code-Steel."

1. All shop welders shall be qualified in accordance with AWS D1.1.
2. All field welders shall be qualified in accordance with Article 1.20-1.05.17.
3. Weld procedures shall be in accordance with AWS D1.1 and shall be approved by the Department prior to the start of the work.

E. Comply with applicable provisions of the following specifications and documents:

1. AISC, "An American National Standard Code of Standard Practice for Steel Buildings and Bridges."
2. AISC, "Seismic Provisions for Structural Steel Buildings" and "Supplement No. 2."
3. AISC, "Specification for Structural Steel Buildings-Allowable Stress Design and Plastic Design."
4. AISC, "Specification for the Design of Steel Hollow Structural Sections."
5. AISC, "Specification for Allowable Stress Design of Single-Angle Members."
6. RCSC, "Specification for Structural Joints Using ASTM High Strength Bolts."
7. AWS D1.1, “Structural Welding for Steel.”

1.6 DELIVERY, STORAGE AND HANDLING:

A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage or other supports and spacers. Protect steel members and packaged materials from erosion and deterioration.

1. Store fasteners in a protected place. Clean and relubricate bolts and nuts that become dry or rusty before use. If surfaces which are to be connected by field bolting or that are subject to field welding become rusted or contaminated with any foreign material that would make these connecting procedures unacceptable, the Contractor shall restore these surfaces at no additional cost to the State by scraping, grinding or wire brushing as necessary to remove all foreign material and rust that will interfere with welding and bolting.
2. Do not store materials on structure in a manner that might cause distortion, damage or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.

1.7 COORDINATION:

A. Furnish anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions and directions for installation.

PART 2 - PRODUCTS

2.1 STRUCTURAL-STEEL MATERIALS:

A. W-Shapes (Beams and Columns), Channels (Headers): ASTM A992 (50 ksi.)

B. Hollow Structural Sections, HSS, (Columns): ASTM A500, Grade C (50 ksi.)

C. Channels (Other than Headers), Angles and Plates: ASTM A 36.

D. Bars: ASTM A 36.

E. Steel Pipe: ASTM A 53, Type E, Grade B or ASTM A106

1. Weight Class: Standard.
2. Finish: Galvanized.

F. Medium-Strength Steel Castings: ASTM A 27, Grade 65-35, carbon steel.

G. Welding Electrodes: E-70 to comply with AWS requirements.

2.2 BOLTS, CONNECTORS AND ANCHORS:

A. High-Strength Bolts, Nuts, and Washers: ASTM F3125 Grade A 325, Type 1, heavy hex steel structural bolts; ASTM A 563 heavy hex carbon-steel nuts; and ASTM F 436 hardened carbon-steel washers.

1. Finish: Plain.

B. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F 3125, Type 1, heavy hex head steel structural bolts with splined ends; ASTM A 563 heavy hex carbon-steel nuts; and ASTM F 436 hardened carbon-steel washers.

1. Finish: Plain.

C. Eye Bolts and Nuts: ASTM A 108, Grade 1030, cold-finished carbon steel.

D. Sleeve Nuts: ASTM A 108, Grade 1018, cold-finished carbon steel.

2.3 PRIMER:

A. Field Paint Primer: Refer to CSI Section 099113 "Exterior Painting" and CSI Section 099123 "Interior Painting."

2.4 GROUT:

A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, non-corrosive, non-staining, mixed with water to consistency suitable for application and a 30-minute working time.

2.5 FABRICATION:

A. Structural Steel: Fabricate and assemble in shop to the fullest extent possible. Fabricate according to AISC's "Code of Standard Practice for Steel Buildings and Bridges" and AISC's "Specification for Structural Steel Buildings-Allowable Stress Design and Plastic Design."

1. Camber structural-steel members where indicated.
2. Identify high-strength structural steel according to ASTM A 6 and maintain markings until structural steel has been erected.
3. Mark and match-mark materials for field assembly.
4. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.

B. Architecturally Exposed Structural Steel: Comply with fabrication requirements, including tolerance limits, of AISC's "Code of Standard Practice for Steel Buildings and Bridges" for structural steel identified as architecturally exposed structural steel.

Fabricate with exposed surfaces smooth, square, and free of surface blemishes including pitting, rust, scale, seam marks, roller marks, rolled trade names and roughness.

1. Remove blemishes by filling or grinding or by welding and grinding, before cleaning, treating and shop priming.

C. Unless shown specifically in the structural drawings, design the connections in simply-supported beam spans to be able to carry one-half of the uniform load capacity of the beam at the specified span shown in the tables of Uniform Load Constants, in Part 2 of the AISC Manual of Steel construction (ASD). Do not use one-sided or other types of eccentric connections for the attachments of main structural members.

D. Thermal Cutting: Perform thermal cutting by machine to the fullest extent possible.

1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1.

E. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.

F. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.

G. Welded Door Frames: Build up welded door frames attached to structural steel. Weld exposed joints continuously and grind smooth. Plug-weld fixed steel bar stops to frames. Secure removable stops to frames with countersunk, cross-recessed head machine screws, uniformly spaced not more than 10 inches o.c., unless otherwise indicated.

H. Holes: Provide holes required for securing other work to structural steel and for passage of other work through steel framing members.

1. Cut, drill or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
2. Base-Plate Holes: Cut, drill, mechanically thermal cut or punch holes perpendicular to steel surfaces.
3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

2.6 SHOP CONNECTIONS:

A. High-Strength Bolts: Shop-install high-strength bolts according to RCSC's "Specification for Structural Joints Using High Strength Bolts" for type of bolt and type of joint specified.

1. Joint Type: Snug tightened and Slip critical.

B. Weld Connections: Comply with AWS D1.1 for welding procedure specifications, tolerances, appearance and quality of welds and for methods used in correcting welding work.

1. Remove backing bars or runoff tabs, back gouge and grind steel smooth.
2. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances of AISC's "Code of Standard Practice for Steel Buildings and Bridges" for mill material.
3. Verify that weld sizes, fabrication sequences and equipment used for architecturally exposed structural steel will limit distortions to allowable tolerances. Prevent weld show-through on exposed steel surfaces.

a. Grind butt welds flush.
b. Grind or fill exposed fillet welds to smooth profile. Dress exposed welds.

2.7 SHOP PRIMING:

A. Shop-prime steel surfaces except the following:

1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches.
2. Surfaces to be field welded.

3. Surfaces to be high-strength bolted with slip-critical connections.
4. Galvanized surfaces.

B. Comply with performance requirements in SSPC-Paint Spec No. 20 Type II Zinc-Rich Organic. Shop-paint structural steel, except those members or portions of members to be embedded in concrete or mortar. Paint embedded steel that is partially exposed on exposed portions and initial 2 inches of embedded areas only. Use any of the following zinc-based products subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. AkzoNobel; Devoe Coatings CATHACOAT 313 Organic Zinc Rich Primer
2. Cloverdale Paint; High Performance ClovaZinc 3 Epoxy Zinc Rich Primer
3. PPG Architectural Finishes, Inc.: Aquapon Zinc-rich Primer 97-670
4. Rust-Oleum; Rust O Zinc Organic Zinc Rich Primer
5. Tnemec Company, Inc.: Tnemec-Zinc 90-97
6. Sherwin-Williams Company: Corothane I GalvaPac Zinc Primer
7. Sherwin-Williams; Protective & Marine Zinc Clad IV

C. All structural steel except as indicated shall be shop-coated with any of the pre-approved zinc-based primer products as listed in this specification.

D. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:

1. SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning." All fins, tears, slivers and burred or sharp edges that are present on any steel member or that appear during the blasting operation shall be removed by grinding and the area re-blasted to give a 2-3 mil surface profile.

E. Steel to steel contact surfaces welded in the shop shall be cleaned but not painted before welding occurs.

F. For all slip-critical connections used, the steel to steel contact surfaces shall not be painted.

G. Parts not in contact but inaccessible after assembly shall be painted before assembly with two coats of shop paint, the second coat to match the system of the finish painting of steel as specified in CSI Division 09 painting Sections. The colors shall be coordinated with approved submittals.

H. The ambient air and surface temperatures shall be at least 5°F above the dewpoint prior to and during coating applications.

2.8 GALVANIZING:

A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel according to ASTM A123.

1. Fill vent holes and grind smooth after galvanizing.
2. Galvanize lintels and shelf angles attached to structural-steel frame and located in exterior walls.
3. Coating weight, surface finish, appearance, and adhesion shall meet the requirements of ASTM A385 as well as ASTM A123.
4. Any high spots of zinc coating left in the galvanizing process in areas that are to be field connected shall be removed by cleaning as specified in SSPC-SP2 (Hand Tool Cleaning) or SSPC-SP3 (Power Tool Cleaning). The zinc shall be removed until it is level with the surrounding area, leaving at least the minimum required zinc thickness.
5. Galvanizing shall be free from uncoated areas, blisters, flux deposits, acid and black spots, and dross inclusions. Lumps, projections, globules, or heavy deposits of zinc will not be permitted. All holes shall be clean and free of excess zinc.
6. Galvanizing shall be uniform in thickness and appearance.

B. Testing and Inspection:

1. Tests for coating thickness of the galvanized coating shall be performed by the methods in ASTM A123-8. The coating thickness shall meet the requirements outlined in ASTM A123-6 in the tables provided.
2. The material shall be inspected in accordance with ASTM A123-9.
3. The Department reserves the right to reject material based on aesthetics.

2.9 SHOP QUALITY CONTROL:

A. The Contractor is responsible for Quality Control inspections of all welding and bolting performed in the shop. Quality Control may be performed by qualified staff, or the Contractor can engage and independent testing and inspection agency to perform shop tests and inspections and prepare test reports.

2.10 SHOP QUALITY ASSURANCE:

A. The Engineer may elect to perform Quality Assurance inspections as deemed necessary. The Contractor shall provide the Engineer the following:

1. Access to all places where structural-steel work is being fabricated, produced, or painted to perform tests and inspections.

2. Provide the Department 7 Calendar Day notice for steel fabrication, production, or painting in Connecticut, and 14 Calendar Day notice for all out-of-state fabrication, production, or painting.

B. Bolted Connections: Shop bolted connections will be tested and inspected according to RCSC's "Specification for Structural Joints Using ASTM High Strength Bolts."

C. Welded Connections: All shop-welded connections shall be visually inspected by a Certified Welding Inspector according to AWS D1.1. Nondestructive testing shall be performed in accordance with AWS D1.1 by a Level 2 Technician certified in accordance with ASNT SNT-TC1 for the method of testing required. All inspection staff certifications shall be available upon request.

D. In addition to visual inspection, shop-welded connections will be tested and inspected according to AWS D1.1 and the following inspection procedures, at testing agency's option:

1. Liquid Penetrant Inspection: ASTM E 165.
2. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
3. Ultrasonic Inspection: ASTM E 164.
4. Radiographic Inspection: ASTM E 94.

PART 3 - EXECUTION

3.1 EXAMINATION:

A. Verify elevations of concrete and masonry bearing surfaces and locations of anchor rods, bearing plates and other embedments, with steel erector present, for compliance with requirements.

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

3.2 PREPARATION:

A. Provide temporary shores, guys, braces and other supports during erection to keep structural steel secure, plumb and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections and bracing are in place, unless otherwise indicated.

1. Do not remove temporary shoring supporting composite deck construction until cast-in-place concrete has attained its design compressive strength.

3.3 ERECTION:

A. Set structural steel accurately in locations and to elevations indicated and according to AISC's "Code of Standard Practice for Steel Buildings and Bridges" and "Specification for Structural Steel Buildings-Allowable Stress Design and Plastic Design."

B. Base and Bearing Plates: Clean concrete and masonry bearing surfaces of bond-reducing materials and roughen surfaces prior to setting base and bearing plates. Clean bottom surface of base and bearing plates.

1. Set base and bearing plates for structural members on wedges, shims or setting nuts as required.
2. Weld plate washers to top of base plate.
3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of base or bearing plate before packing with grout.
4. Promptly pack grout solidly between bearing surfaces and base plates to eliminate any voids. Neatly finish exposed surfaces, protect grout and allow to cure. Comply with manufacturers written installation instructions for shrinkage-resistant grouts.

C. Maintain erection tolerances of structural steel and architecturally exposed structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges."

D. Align and adjust various members forming part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

1. Level and plumb individual members of structure.
2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.

E. Splice members only where indicated.

F. Remove erection bolts on architecturally exposed structural steel. Fill holes with plug welds and grind smooth at exposed surfaces.

G. Do not use thermal cutting during erection.

H. Do not enlarge deficient holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.

3.4 FIELD CONNECTIONS:

A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using High Strength Bolts" for type of bolt and type of joint specified.

1. Joint Type: Snug tightened and Slip-critical, as indicated.

B. Weld Connections: Comply with AWS D1.1 for welding procedure specifications, tolerances, appearance, and quality of welds and for methods used in correcting welding work.

1. Comply with AISC's "Code of Standard Practice for Steel Buildings and Bridges" and "Specification for Structural Steel Buildings-Allowable Stress Design and Plastic Design" for bearing, adequacy of temporary connections, alignment and removal of paint on surfaces adjacent to field welds.
2. Remove backing bars or run-off tabs, back gouge, and grind steel smooth.
3. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances of AISC's "Code of Standard Practice for Steel Buildings and Bridges" for mill material.
4. Verify that weld sizes, fabrication sequences and equipment used for architecturally exposed structural steel will limit distortions to allowable tolerances. Prevent weld show-through on exposed steel surfaces.

a. Grind butt welds flush.
b. Grind or fill exposed fillet welds to smooth profile. Dress exposed welds.

3.5 FIELD QUALITY CONTROL:

A. The Engineer may elect to perform Quality Assurance inspections as deemed necessary.

B. The Contractor is responsible for Quality Control inspections of all welding and bolting performed in the field. Quality Control may be performed by qualified staff, or the Contractor can engage and independent testing and inspection agency to perform shop tests and inspections and prepare test reports.

C. Bolted Connections: Shop and field-bolted connections will be tested and inspected according to RCSC's "Specification for Structural Joints Using ASTM High Strength Bolts."

D. Welded Connections: All shop and field-welded connections shall be visually inspected by a Certified Welding Inspector according to AWS D1.1. Nondestructive testing shall be performed in accordance with AWS D1.1 by a Level 2 Technician certified in accordance with ASNT SNT-TC1 for the method of testing required. All inspection staff certifications shall be available upon request.

E. In addition to visual inspection, shop-welded connections will be tested and inspected according to AWS D1.1 and the following inspection procedures, at testing agency's option:

1. Liquid Penetrant Inspection: ASTM E 165.
2. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
3. Ultrasonic Inspection: ASTM E 164.
4. Radiographic Inspection: ASTM E 94.

3.6 REPAIRS AND PROTECTION:

A. The Contractor shall submit repair procedures to the Engineer for concurrence prior to the start of any repair work.

B. Repair damaged galvanized coatings on galvanized items with galvanized repair paint according to manufacturer's written instructions and ASTM A780 and ASTM A123 with the exception that only brush applied flat, light gray zinc rich coating shall be permitted. No aerosol products shall be permitted for use.

1. Damage that occurs in the shop will be repaired in the shop.
2. Damage that occurs during transport or in the field shall be submitted and reviewed by the Engineer to determine the repair requirements.

C. Touchup Painting: After installation, promptly clean, prepare, and reprime field connections, rust spots and abraded surfaces of shop prime-painted joists and accessories, bearing plates and abutting structural steel.

1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.
2. Apply a compatible field paint primer of same type as shop primer used on adjacent surfaces.
3. Touchup Painting: Cleaning and touchup painting are specified in CSI Division 09 painting Sections.

END OF SECTION 051200

SECTION 052100 - STEEL JOIST FRAMING

PART 1 - GENERAL

1.1 SUMMARY:

A. This Section includes the following:

1. Long-span steel joists.
2. Joist accessories.
3. Shop Primer

B. Related CSI Sections include the following:

1. Division 03 Section 033000, "Cast-in-Place Concrete" for installing bearing plates in concrete.
2. Division 04 Section 042000, "Unit Masonry" for installing bearing plates in unit masonry.
3. Division 09 painting Sections for finish painting of steel joists.

1.2 DEFINITIONS:

A. SJI "Specifications": Steel Joist Institute's "Standard Specifications, Load Tables and Weight Tables for Steel Joists and Joist Girders."

B. Special Joists: Steel joists or joist girders requiring modification by manufacturer to support non-uniform, unequal, or special loading conditions that invalidate load tables in SJI's "Specifications."

1.3 PERFORMANCE REQUIREMENTS:

A. Structural Performance: Provide special joists and connections capable of withstanding design loads within limits and under conditions indicated.

B. Design special joists to withstand design loads with live load deflections no greater than the following:

1. Roof Joists: Vertical deflection of 1/360 of the span.

1.4 SUBMITTALS:

A. Submit the following in accordance with Form 818 Article 1.20-1.05.02 and NOTICE TO CONTRACTOR – SUBMITTALS.

B. Product Data: For each type of joist, accessory and product indicated.

C. Working Drawings: Show layout, designation, number, type, location and spacing of joists. Include joining and anchorage details, bracing, bridging, joist accessories; splice and connection locations and details; and attachments to other construction.

1. Indicate locations and details of bearing plates to be embedded in other construction.
2. Comprehensive engineering analysis of special joists signed and sealed by the qualified professional engineer responsible for its preparation.

D. Quality Assurance Submittals:

1. Welding certificates. Copies of certificates for welding procedures and personnel.
2. Manufacturer Certificates: Signed by manufacturers certifying that joists comply with requirements.
3. Mill Certificates: Signed by bolt manufacturers certifying that bolts comply with requirements.
4. Qualification Data: For firms and persons specified in Part 1.5, “Quality Assurance” to demonstrate their capabilities and experience. Include list of completed projects with project names and addresses of architects and owners and other information specified.
5. Research/Evaluation Reports: Evidence of steel joists compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.

1.5 QUALITY ASSURANCE:

A. Manufacturer Qualifications: A manufacturer certified by SJI to manufacture joists complying with applicable standard specifications and load tables of SJI "Specifications."

1. Manufacturer's responsibilities include providing professional engineering services for designing special joists to comply with performance requirements.
2. Professional Engineer Qualifications: A professional engineer licensed in the State of Connecticut and who is experienced in providing engineering services of the kind indicated.

B. SJI Specifications: Comply with standard specifications in SJI's "Specifications" that are applicable to types of joists indicated.

C. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code - Steel.", and AWS D1.3" Structural Welding Code-Sheet Steel".

1.6 DELIVERY, STORAGE, AND HANDLING:

A. Deliver, store, and handle joists as recommended in SJI's "Specifications."

B. Protect joists from corrosion, deformation, and other damage during delivery, storage, and handling.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Steel: Comply with SJI's "Specifications" for web and steel-angle chord members.

B. Steel Bearing Plates: ASTM A 36.

C. Carbon-Steel Bolts and Threaded Fasteners: ASTM A 307, Grade A, carbon-steel, hex-head bolts and threaded fasteners; carbon-steel nuts; and flat, unhardened steel washers.

1. Finish: Hot-dip zinc coating, ASTM A 153/A, Class C.

D. High-Strength Bolts, Nuts and Washers: ASTM A 325, Type 1, heavy hex steel structural bolts; heavy hex carbon-steel nuts; and hardened carbon-steel washers.

1. Finish: Hot-dip zinc coating, ASTM A 153/A, Class C.

E. Welding Electrodes: Comply with AWS standards.

~~F. Galvanizing Repair Paint: ASTM A 780.~~

2.2 SHOP PRIMER:

A. Field Paint Primer: Refer to CSI Section 099113 "Exterior Painting" and CSI Section 099123 "Interior Painting.

B. Shop Primer: Comply with performance requirements in SSPC-Paint Spec No. 20 Type II Zinc - Rich Organic

C. Shop Primer: Use any of the following zinc-based products subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. AkzoNobel; Devoe Coatings CATHACOAT 313 Organic Zinc Rich Primer

2. Cloverdale Paint; High Performance ClovaZinc 3 Epoxy Zinc Rich Primer
3. PPG Architectural Finishes, Inc.: Aquapon Zinc-rich Primer 97-670
4. Rust-Oleum; Rust O Zinc Organic Zinc Rich Primer
5. Tnemec Company, Inc.: Tnemec-Zinc 90-97
6. Sherwin-Williams Company: Corothane I GalvaPac Zinc Primer
7. Sherwin-Williams; Protective & Marine Zinc Clad IV

2.3 LONG-SPAN STEEL JOISTS:

A. Manufacture steel joists according to "Standard Specifications for Longspan Steel Joists, LH-Series and Deep Longspan Steel Joists, DLH-Series" in SJI's "Specifications," with steel-angle top- and bottom-chord members; of joist type and end and top-chord arrangements as follows:

1. Joist Type: LH-series steel joists.
2. End Arrangement: Underslung.
3. Top-Chord Arrangement: Parallel.

B. Comply with AWS requirements and procedures for shop welding, appearance, quality of welds, and methods used in correcting welding work.

C. Provide holes in chord members for connecting and securing other construction to joists.

D. Camber long-span steel joists according to SJI's "Specifications".

2.4 JOIST ACCESSORIES:

A. Bridging: Provide bridging anchors and number of rows of horizontal or diagonal bridging of material, size, and type required by SJI's "Specifications" for type of joist, chord size, spacing, and span. Furnish additional erection bridging if required for stability.

B. Steel bearing plates with integral anchorages are specified in CSI Division 05 Section 055000, "Metal Fabrications."

C. Supply miscellaneous accessories, including splice plates and bolts required by joist manufacturer to complete joist installation.

2.5 CLEANING AND SHOP PAINTING:

A. Clean and remove loose scale, heavy rust, and other foreign materials from fabricated joists and accessories by hand-tool cleaning, SSPC-SP 2.

B. Apply 1 coat of shop primer to joists and joist accessories to be primed to provide a continuous, dry paint film not less than 1 mil thick.

C. Shop priming of joists and joist accessories is specified in Section 2.2 C, field priming is specified in CSI Division 09 painting Sections.

PART 3 - EXECUTION

3.1 EXAMINATION:

A. Examine supporting substrates, embedded bearing plates, and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance.

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

3.2 INSTALLATION:

A. Do not install joists until supporting construction is in place and secured.

B. Install joists and accessories plumb, square, and true to line; securely fasten to supporting construction according to SJI's "Specifications," joist manufacturer's written recommendations, and requirements in this Section.

1. Before installation, splice joists delivered to Project site in more than one piece.
2. Space, adjust, and align joists accurately in location before permanently fastening.
3. Install temporary bracing and erection bridging, connections, and anchors to ensure that joists are stabilized during construction.
4. Delay rigidly connecting bottom-chord extensions to columns or supports until dead loads have been applied.

C. Field weld joists to supporting steel bearing plates and framework. Coordinate welding sequence and procedure with placement of joists. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.

D. Install and connect bridging concurrently with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom chords if terminating at walls or beams.

3.3 FIELD QUALITY CONTROL:

A. Testing Agency: The Contractor will engage a qualified independent testing and inspecting agency to inspect field welds and bolted connections and to perform field tests and inspections and prepare test and inspection reports.

B. In addition to visual inspection, field welds will be tested according to AWS D1.1 and the following procedures, as applicable:

1. Radiographic Testing: ASTM E 94.
2. Magnetic Particle Inspection: ASTM E 709.
3. Ultrasonic Testing: ASTM E 164.
4. Liquid Penetrant Inspection: ASTM E 165.

C. Bolted connections will be visually inspected.

D. High-strength, field-bolted connections will be tested and verified according to procedures in RCSC's "Specification for Structural Joints Using ASTM A 325 or ASTM A 490 Bolts."

E. Correct deficiencies in Work that test and inspection reports have indicated are not in compliance with specified requirements.

F. Additional testing will be performed to determine compliance of corrected Work with specified requirements.

3.4 REPAIRS AND PROTECTION:

~~A. Repair damaged galvanized coatings on galvanized items with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.~~

B. Touchup Painting: After installation, promptly clean, prepare, and reprime field connections, rust spots, and abraded surfaces of shop prime-painted joists, abutting structural steel, and accessories.

1. Clean and prepare surfaces by hand-tool cleaning, SSPC-SP 2, or power-tool cleaning, SSPC-SP 3.
2. Apply a compatible field paint primer of same type as shop primer used on adjacent surfaces.
3. Cleaning and touchup painting are specified in CSI Division 09 painting Sections.

C. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and installer that ensure that joists and accessories are without damage or deterioration at time of the issuance of the Certificate of Compliance.

END OF SECTION 052100

SECTION 055000 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY:

A. This Section includes the following:

1. Steel framing and supports for mechanical and electrical equipment.
2. Steel framing and supports for applications where framing and supports are not specified in other Sections.
3. Loose bearing and leveling plates.
4. Steel weld plates and angles for casting into concrete not specified in other Sections.
5. Structural-steel door frames.
6. Miscellaneous steel trim including steel angle corner guards.
7. Metal ladders.

B. Products furnished, but not installed, under this Section include the following:

1. Loose steel lintels.
2. Anchor bolts, steel pipe sleeves and wedge-type inserts indicated to be cast into concrete or built into unit masonry.

C. Related CSI Sections include the following:

1. Division 03 Section 033000, "Cast-in-Place Concrete" for installing anchor bolts, steel pipe sleeves, wedge-type inserts and other items indicated to be cast into concrete.
2. Division 04 Section 042000, "Unit Masonry" for installing loose lintels, anchor bolts and other items indicated to be built into unit masonry.
3. Division 05 Section 051200, "Structural Steel Framing."
4. Division 06 Section 061000, "Rough Carpentry" for metal framing anchors.

1.2 PERFORMANCE REQUIREMENTS:

A. Structural Performance of Ladders: Provide ladders capable of withstanding the effects of loads and stresses within limits and under conditions specified in ANSI A14.3.

B. Thermal Movements: Provide exterior metal fabrications that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of connections and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1.3 SUBMITTALS:

A. Submit the following in accordance with Form 818 Article 1.20-1.05.02 and NOTICE TO CONTRACTOR-SUBMITTALS.

B. Product Data: For the following:

1. Paint products.
2. Grout.
3. Ladders.
4. Drilled-In Anchors.
5. Materials used in miscellaneous metal fabrications.

C. Shop Drawings: Show fabrication and installation details for metal fabrications.

1. Include plans, elevations, sections and details of metal fabrications and their connections. Show anchorage and accessory items.
2. Provide templates for anchors and bolts specified for installation under other Sections.

D. Working Drawings: Show fabrication and installation details for metal fabrications.

1. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

E. Quality Assurance Submittals

1. Welding certificates. Copies of certificates for welding procedures and personnel.
2. Qualification Data: For Professional Engineer.

1.4 QUALITY ASSURANCE:

A. Welding: Qualify procedures and personnel according to the following:

1. AWS D1.1, "Structural Welding Code--Steel."
2. AWS D1.2, "Structural Welding Code--Aluminum."
3. AWS D1.3, "Structural Welding Code--Sheet Steel."
4. AWS D1.6, "Structural Welding Code--Stainless Steel."
5. Certify that each welder has satisfactory passed AWS qualification test for welding process involved and, if pertinent, has undergone recertification.

1.5 PROJECT CONDITIONS:

A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication and indicate measurements on Shop Drawings.

1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating metal fabrications without field measurements. Coordinate wall and other contiguous construction to ensure that actual dimensions correspond to established dimensions.
2. Provide allowance for trimming and fitting at site.

1.6 COORDINATION:

A. Coordinate installation of anchorages for metal fabrications. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts and items with integral anchors that are to be embedded in concrete or masonry. Deliver such items to Project Site in time for installation.

B. Coordinate installation of steel weld plates and angles for casting into concrete that are specified in this Section but required for work of another Section. Deliver such items to Project Site in time for installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

A. In other portions of Part 2 where titles below introduce lists, the following requirements apply to product selection:

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

2.2 METALS, GENERAL:

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

2.3 FERROUS METALS:

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

B. Steel Pipe: ASTM A 53, standard weight (Schedule 40), unless another weight is indicated or required by structural loads.

2.4 FASTENERS:

A. General: Unless otherwise indicated, provide Type 304 and Type 316 for corrosive environment, stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633, Class Fe/Zn 5, at exterior walls. Provide stainless-steel fasteners for fastening aluminum. Select fasteners for type, grade and class required.

B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A; with hex nuts, ASTM A 563; and where indicated, flat washers.

C. Anchor Bolts: ASTM F 1554, Grade 36

1. Provide hot-dip or mechanically deposited, zinc-coated anchor bolts where item being fastened is indicated to be galvanized.

D. Eyebolts: ASTM A 489

E. Machine Screws: ASME B18.6.3

F. Lag Bolts: ASME B18.2.1

G. Wood Screws: Flat head, ASME B18.6.1

H. Plain Washers: Round, ASME B18.22.1

I. Lock Washers: Helical, spring type, ASME B18.21.1

J. Cast-in-Place Anchors in Concrete: Anchors capable of sustaining, without failure, a load equal to four times the load imposed, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.

1. Threaded or wedge type; galvanized ferrous castings, either ASTM A 47 malleable iron or ASTM A 27 cast steel. Provide bolts, washers and shims as needed, hot-dip galvanized per ASTM A 153.

K. Expansion Anchors: Anchor bolt and sleeve assembly with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.

1. Material for Anchors in Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B 633, Class Fe/Zn 5.

2. Material for Anchors in Exterior Locations: Alloy Group 1 (A1) or 2 (A4) stainless-steel bolts complying with ASTM F 593 and nuts complying with ASTM F 594.

2.5 MISCELLANEOUS MATERIALS:

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

B. Field Paint Primer: Comply with Section 099113 "Exterior Painting" and Section 099123 "Interior Painting. Shop Primer: Comply with performance requirements in SSPC-Paint Spec No. 20 Type II Zinc-Rich Organic

1. Use any of the following zinc-based products subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. AkzoNobel; Devoe Coatings CATHACOAT 313 Organic Zinc Rich Primer
b. Cloverdale Paint; High Performance ClovaZinc 3 Epoxy Zinc Rich Primer
c. PPG Architectural Finishes, Inc.: Aquapon Zinc-rich Primer 97-670
d. Rust-Oleum; Rust O Zinc Organic Zinc Rich Primer Tnemec Company, Inc.: Tnemec-Zinc 90-97
e. Sherwin-Williams Company: Corothane I GalvaPac Zinc Primer
f. Sherwin-Williams; Protective & Marine Zinc Clad IV

C. Galvanizing Repair Paint: High-zinc-dust-content paint for re-galvanizing welds in steel, complying with SSPC-Paint 20.

D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

E. Non-shrink, Non-metallic Grout: Factory-packaged, non-staining, non-corrosive, non-gaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

F. Concrete Materials and Properties: Comply with requirements in CSI Division 03 Section 033000, "Cast-in-Place Concrete" for normal-weight, air-entrained, ready-mix concrete with a minimum 28-day compressive strength of 4000 psi, unless otherwise indicated.

2.6 FABRICATION, GENERAL:

A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural strength and integrity of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Cut, drill and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch, unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

D. Form exposed work true to line and level with accurate angles and surfaces and straight edges.

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

1. Use materials and methods that minimize distortion and develop strength and corrosion-resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and the contour of welded surface matches that of adjacent surface.

F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) screws or bolts, unless otherwise indicated. Locate joints where least conspicuous.

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

H. Cut, reinforce, drill and tap metal fabrications as indicated to receive finish hardware, screws and similar items.

I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

J. Allow for thermal movement resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening up of joints, overstressing of components, failure of connections and other detrimental effects. Base engineering calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F, ambient; 180 F, material surfaces.

2.7 MISCELLANEOUS FRAMING AND SUPPORTS:

A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.

B. Fabricate units from steel shapes, plates and bars of welded construction, unless otherwise indicated. Fabricate to sizes, shapes and profiles indicated and as necessary to receive adjacent construction retained by framing and supports. Cut, drill and tap units to receive hardware, hangers and similar items.

1. Fabricate units from slotted channel framing where indicated.
2. Furnish inserts if units are installed after concrete is placed.

C. Fabricate steel girders for wood frame construction from continuous steel shapes of sizes indicated.

1. Provide bearing plates welded to beams where indicated.
2. Drill girders and plates for field-bolted connections where indicated.
3. Where wood nailers are attached to girders with bolts or lag screws, drill holes at 24 inches o.c.

D. Fabricate steel pipe columns for supporting wood frame construction from steel pipe with steel base plates and top plates as indicated. Drill base plates and top plates for anchor and connection bolts and weld to pipe with fillet welds all around. Make welds the same size as pipe wall thickness, unless otherwise indicated.

1. Unless otherwise indicated, fabricate from Schedule 40 steel pipe.
2. Unless otherwise indicated, provide 1/2-inch base plates with four 5/8-inch anchor bolts and 1/4-inch top plates.

E. Galvanize miscellaneous framing and supports where indicated.

2.8 LOOSE STEEL LINTELS:

A. Fabricate loose steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated. Weld adjoining members together to form a single unit where indicated.

B. Size loose lintels to provide bearing length at each side of openings equal to 1/12 of clear span but not less than 8 inches, unless otherwise indicated.

C. Galvanize loose steel lintels located in exterior walls.

2.9 LOOSE BEARING AND LEVELING PLATES:

A. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction. Drill plates to receive anchor bolts and for grouting.

B. Galvanize plates after fabrication.

2.10 STEEL WELD PLATES AND ANGLES:

A. Provide steel weld plates and angles not specified in other Sections, for items supported from concrete construction as needed to complete the Work. Provide each unit with not less than two integrally welded steel strap anchors for embedding in concrete.

2.11 MISCELLANEOUS STEEL TRIM:

A. Unless otherwise indicated, fabricate units from steel shapes, plates and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.

B. Provide cutouts, fittings and anchorages as needed to coordinate assembly and installation with other work.

1. Provide with integrally welded steel strap anchors for embedding in concrete or masonry construction.

C. Galvanize exterior miscellaneous steel trim and interior miscellaneous steel trim, where indicated.

2.12 METAL LADDERS:

A. General:

1. Comply with ANSI A14.3, unless otherwise indicated.
2. Space side-rails 24 inches apart, unless otherwise indicated.
3. Support each ladder at top and bottom and not more than 48 inches o.c. with welded or bolted brackets, made from same metal as ladder to comply with ANSI A 14.3 and manufacturer's recommendations.
4. Galvanize interior and exterior metal ladders and safety cages.

B. Metal Ladders:

1. Side-rails: Continuous channels or tubes, not less than 2-1/2 inches deep, 3/4 inch wide, and 1/8 inch thick.
2. Rungs: Tubes, not less than 3/4 inch deep and not less than 1/8 inch thick, with ribbed tread surfaces.
3. Fit rungs in centerline of side-rails; fasten by welding or with stainless-steel fasteners or brackets.

2.13 METAL LADDER SAFETY CAGES:

A. General:

1. Fabricate ladder safety cages to comply with ANSI A14.3. Assemble by welding or with stainless-steel fasteners.
2. Provide primary hoops at tops and bottoms of cages and spaced not more than 20 feet o.c. Provide secondary intermediate hoops spaced not more than 48 inches o.c. between primary hoops.
3. Fasten assembled safety cage to ladder rails and adjacent construction by welding or with stainless-steel fasteners, unless otherwise indicated.

B. Ladder Safety Cages:

1. Primary Hoops: 1/4-by-4-inch flat bar hoops.
2. Secondary Intermediate Hoops: 1/4-by-2-inch flat bar hoops.
3. Vertical Bars: 1/4-by-2-inch flat bars secured to each hoop.

2.14 FINISHES, GENERAL:

A. Comply with CSI Division 09 painting Sections.

B. Finish metal fabrications after assembly.

2.15 STEEL AND IRON FINISHES:

A. Galvanizing: Hot-dip galvanize items as indicated to comply with applicable standard listed below:

1. ASTM A 123, for galvanizing steel and iron products.
2. ASTM A 153, for galvanizing steel and iron hardware.

B. Preparation for Shop Priming: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:

1. SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning." All fins, tears, slivers and burred or sharp edges that are present on any steel member or that appear during the blasting operation shall be removed by grinding and the area re-blasted to give a 2-3 mil surface profile.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL:

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

B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

C. Field Welding: Comply with the following requirements:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag bolts, wood screws and other connectors.

E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry or similar construction.

F. Corrosion Protection: Coat concealed surfaces of aluminum that will come into contact with grout, concrete, masonry, wood or dissimilar metals with a heavy coat of bituminous paint.

3.2 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS:

A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.

B. Anchor supports for operable partitions securely to and rigidly brace from building structure.

C. Support steel girders on solid grouted masonry, concrete or steel pipe columns. Secure girders with anchor bolts embedded in grouted masonry or concrete or with bolts through top plates of pipe columns.

1. Where grout space under bearing plates is indicated for girders supported on concrete or masonry, install as specified in Part 3.3 "Installing Bearing and Leveling Plates".

D. Install pipe columns on concrete footings with grouted base plates. Position and grout column base plates as specified in Part 3.3 "Installing Bearing and Leveling Plates".

1. Grout base plates of columns supporting steel girders after girders are installed and leveled.

3.3 INSTALLING BEARING AND LEVELING PLATES:

A. Clean concrete and masonry bearing surfaces of bond-reducing materials and roughen to improve bond to surfaces. Clean bottom surface of plates.

B. Set bearing and leveling plates on wedges, shims or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with grout.

1. Use non-shrink, non-metallic grout in exposed locations, unless otherwise indicated.
2. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.4 ADJUSTING AND CLEANING:

B. Touchup Painting: After installation, promptly clean, prepare, and reprime field connections, rust spots and abraded surfaces of shop prime-painted accessories**,** bearing plates and metal fabrications.
1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.
2. Apply a compatible field paint primer of same type as shop primer used on adjacent surfaces.
3. Touchup Painting: Cleaning and touchup painting comply with CSI Division 09 painting Sections.

C. Galvanized Surfaces: Clean field welds, bolted connections and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION 055000

SECTION 099113 - EXTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY:

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

1. Steel Substrates.
2. Door and Door Frames.

B. Related CSI Sections include the following:

1. Division 09 Section 099123, "Interior Painting" for surface preparation and the application of paint systems on interior substrates.

1.2 SUBMITTALS:

A. Submit the following in accordance with Form 817 Article 1.20-1.05.02 and NOTICE TO CONTRACTOR – SUBMITTALS.

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

1. Indicate VOC content.

C. Samples for Verification: For each type of paint system and each color and gloss of topcoat indicated.

1. Submit Samples on rigid backing, 8 inches square.
2. Step coats on Samples to show each coat required for system.
3. Label each coat of each Sample.
4. Label each Sample for location and application area.

D. Product List: For each product indicated, include the following:

1. Cross-reference to paint system and locations of application areas. Use same designations indicated on plans and in schedules.
2. Printout of current "MPI Approved Products List" for each product category specified in Part 2, with the proposed product highlighted.

1.3 QUALITY ASSURANCE:

A. MPI Standards:

1. Products: Complying with MPI standards indicated and listed in "MPI Approved Products List."
2. Preparation and Workmanship: Comply with requirements in "MPI Architectural Painting Specification Manual" for products and paint systems indicated.

1.4 DELIVERY, STORAGE, AND HANDLING:

A. Deliver all painting materials in sealed, original labeled containers bearing manufacturer's name, brand name, type of paint or coating and color designation, standard compliance, materials content as well as mixing and/or reducing and application requirements.

B. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

C. Where toxic and/or volatile / explosive / flammable materials are being used, provide adequate fireproof storage lockers and take all necessary precautions and post adequate warnings (e.g. no smoking) as required.

D. Take all necessary precautionary and safety measures to prevent fire hazards and spontaneous combustion and to protect the environment from hazard spills. Materials that constitute a fire hazard (paints, solvents, drop clothes, etc.) shall be stored in suitable closed and rated containers and removed from the site on a daily basis.

1.5 PROJECT CONDITIONS:

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.

B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Benjamin Moore & Co.

2. ICI Paints.
3. Pittsburgh Paints.
4. Sherwin-Williams Company (The).

B. Basis of Design Color Selections (where known):

1. Exterior Steel, Doors and Frames: Dark Brown, Bronzetone #C16360 as manufactured by Pittsburgh Paints, or an approved equal.

2.2 PAINT, GENERAL:

A. Material Compatibility:

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

B. Colors: As selected by Designer from manufacturer's full range.

C. VOC Content: For field applications, paints and coatings shall comply with VOC content limits of authorities having jurisdiction at the Project location.

2.3 METAL PRIMERS:

A. Zinc-Rich Organic Primer: Corrosion resistant, zinc-rich primer; formulated for use on prepared steel subject to severe industrial or marine environments.

1. MPI #20.

B. Water-Based, Galvanized Metal Primer: Corrosion-resistant, pigmented, acrylic primer; formulated for use on cleaned/etched exterior galvanized metal, to prepare it for subsequent water-based coatings.

1. MPI #134

2.4 EXTERIOR ACRYLIC PAINTS:

A. Exterior Acrylic Gloss Level 6: Water-based, pigmented, acrylic-copolymer-emulsion coating formulated for alkali, mold, microbial, scrub, blocking (sticking of two painted surfaces) and water resistance, and for use on exterior, primed, wood and metal.

1. MPI #114

B. Light Industrial Coating, Exterior, Water Based, Gloss Level 6: Water-based, pigmented, emulsion coating for exterior primed wood and metal surfaces, providing resistance to moderate abrasion and mild chemical exposure and corrosive conditions.

1. MPI #164

2.5 BLOCK FILLERS:

A. Exterior Latex Block Filler: Water-based, pigmented, high solids, emulsion coating formulated to bridge and fill porous surfaces of exterior concrete masonry units in preparation for specified subsequent coatings.

1. MPI #4.

2.6 EXTERIOR LATEX PAINTS:

A. Exterior Latex, Flat, Gloss Level 1: Water-based, pigmented coatings, formulated for alkali, mold, microbial and water resistance and for use on exterior surfaces such as Portland cement plaster, concrete and primed wood.

1. MPI #10.

PART 3 - EXECUTION

3.1 EXAMINATION:

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

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

C. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.

1. Beginning coating application constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION:

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

B. Remove plates, machined surfaces, and similar items already in place that are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
2. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.

C. Clean substrates of substances that could impair bond of paints, including dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers as required to produce paint systems indicated.

D. Steel Substrates: Remove rust and loose mill scale. Clean using methods recommended in writing by paint manufacturer.

E. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

F. C.M.U. Substrates: Remove dirt and loose paint. Clean using methods recommended in writing by paint manufacturer.

3.3 APPLICATION:

A. Apply paints according to manufacturer's written instructions.

1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.

B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

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

3.4 FIELD QUALITY CONTROL:

A. Contractor shall touch up and restore painted surfaces damaged during construction.

3.5 CLEANING AND PROTECTION:

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project Site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

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

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

3.6 EXTERIOR PAINTING SCHEDULE:

A. Steel Substrates:

1. Structural Steel:

a. Prime Coat: Zinc rich organic primer.
b. Intermediate Coat: Exterior acrylic to match topcoat.
c. Topcoat: Exterior acrylic, gloss.
d. Door Stencils: Exterior acrylic to match topcoat.

B. Doors and Door Frames:

1. Water-Based Light Industrial Coating System:

a. Prime Coat: Galvanized primer, water based.
b. Intermediate Coat: Light industrial coating to match topcoat.
c. Topcoat: Light industrial coating, water based, gloss.
d. Door Stencils: Light industrial coating to match topcoat.

C. Galvanized-Metal Substrates:

1. Latex over Waterbourne Primer System:

a. Prime Coat: Galvanized primer, water based.
b. Intermediate Coat: Exterior acrylic to match topcoat.
c. Topcoat: Exterior acrylic, gloss.

END OF SECTION 099113

SECTION 099123 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY:

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

1. Concrete slab.
2. Concrete masonry units (CMU).
3. Steel.
4. Wood.

B. Related CSI Sections include the following:

1. Division 05 Section 051200, “Structural Steel Framing” for shop primer information on structural steel members.
2. Division 05 Section 052100, “Steel Joist Framing” for shop primer information on steel joists.
3. Division 09 Section 099113, "Exterior Painting" for surface preparation and the application of paint systems on exterior substrates.

1.2 SUBMITTALS:

A. Submit the following in accordance with Form 818 Article 1.20-1.05.02 and NOTICE TO CONTRACTOR – SUBMITTALS.

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

1. Indicate VOC content.

C. Samples for Verification: For each type of paint system and in each color and gloss of topcoat indicated.

1. Submit Samples on rigid backing, 8 inches square.
2. Step coats on Samples to show each coat required for system.
3. Label each coat of each Sample.
4. Label each Sample for location and application area.

D. Product List: For each product indicated, include the following:

1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.

2. Printout of current "MPI Approved Products List" for each product category specified in Part 2, with the proposed product highlighted.

1.3 QUALITY ASSURANCE:

A. MPI Standards:

1. Products: Complying with MPI standards indicated and listed in "MPI Approved Products List."
2. Preparation and Workmanship: Comply with requirements in "MPI Architectural Painting Specification Manual" for products and paint systems indicated.

1.4 DELIVERY, STORAGE, AND HANDLING:

A. Deliver all painting materials in sealed, original labeled containers bearing manufacturer's name, brand name, type of paint or coating and color designation, standard compliance, materials content as well as mixing and/or reducing and application requirements.

B. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

C. Where toxic and/or volatile / explosive / flammable materials are being used, provide adequate fireproof storage lockers and take all necessary precautions and post adequate warnings (e.g. no smoking) as required.

D. Take all necessary precautionary and safety measures to prevent fire hazards and spontaneous combustion and to protect the environment from hazard spills. Materials that constitute a fire hazard (paints, solvents, drop clothes, etc.) shall be stored in suitable closed and rated containers and removed from the site on a daily basis.

1.5 PROJECT CONDITIONS:

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.

B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

C. Perform no interior painting or decorating work unless adequate continuous ventilation and sufficient heating facilities are in place to maintain ambient air and substrate temperatures above minimum requirements for 24 hours before, during and after paint

application. Provide supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements.

D. Conduct all moisture tests using a properly calibrated electronic Moisture Meter, except test concrete floors for moisture using a simple cover patch test.

E. Test masonry surfaces for alkalinity as required.

1. Masonry surfaces must be installed at least 28 days prior to painting and decorating work and must be visually dry on both sides.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Benjamin Moore & Co.
2. ICI Paints.
3. Pittsburgh Paints.
4. Sherwin-Williams Company (The).

B. Basis of Design Color Selections (where known):

1. Interior Steel, Doors and Frames: Dark Brown, Bronzetone #C16360 as manufactured by Pittsburgh Paints, or an approved equal.
2. Interior CMU Walls: Off White, SPEEDHIDE product line as manufactured by Pittsburgh Paints, or an approved equal.
3. Interior CMU Wall Sealer: SEAL GRIP product line as manufactured by Pittsburgh Paints, or an approved equal.
4. Interior CMU Block Filler: SPEEDHIDE product line as manufactured by Pittsburgh Paints, or an approved equal.
5. Fire Suppression Piping: Red, Gypsy Red #SW 6865 as manufactured by Sherwin-Williams, or an approved equal.

2.2 PAINT, GENERAL:

A. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.

2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

B. Chemical Components of Field-Applied Interior Paints and Coatings: Provide topcoat paints and anti-corrosive and anti-rust paints applied to ferrous metals that comply with the following chemical restrictions; these requirements do not apply to paints and coatings that are applied in a fabrication or finishing shop:

1. Flat Paints, Coatings, and Primers: VOC content of not more than 50 g/L.
2. Non-flat Paints, Coatings, and Primers: VOC content of not more than 150 g/L.
3. Aromatic Compounds: Paints and coatings shall not contain more than 1.0 percent by weight of total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).
4. Restricted Components: Paints and coatings shall not contain any of the following:

    a. Acrolein.
    b. Acrylonitrile.
    c. Antimony.
    d. Benzene.
    e. Butyl benzyl phthalate.
    f. Cadmium.
    g. Di (2-ethylhexyl) phthalate.
    h. Di-n-butyl phthalate.
    i. Di-n-octyl phthalate.
    j. 1,2-dichlorobenzene.
    k. Diethyl phthalate.
    l. Dimethyl phthalate.
    m. Ethylbenzene.
    n. Formaldehyde.
    o. Hexavalent chromium.
    p. Isophorone.
    q. Lead.
    r. Mercury.
    s. Methyl ethyl ketone.
    t. Methyl isobutyl ketone.
    u. Methylene chloride.
    v. Naphthalene.
    w. Toluene (methylbenzene).
    x. 1,1,1-trichloroethane.
    y. Vinyl chloride.

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

D. VOC Content: For field applications, paints and coatings shall comply with VOC content limits of authorities having jurisdiction at the Project location.

2.3 METAL PRIMERS:

A. Zinc-Rich Organic Primer: Corrosion resistant, zinc-rich primer; formulated for use on prepared steel subject to severe industrial or marine environments.

1. MPI #20

B. Galvanized Water Based Primer: Corrosion-resistant, acrylic primer; formulated for use on cleaned/etched, exterior, galvanized metal to prepare it for subsequent water-based coatings.

1. MPI #134.

C. Rust-Inhibitive Water Based Primer: Corrosion-resistant, water-based-emulsion primer formulated for resistance to flash rusting when applied to cleaned, interior ferrous metals subject to mildly corrosive environments.

1. MPI #107.

2.4 BLOCK FILLERS:

A. Interior/Exterior Latex Block Filler: Water-based, pigmented, high solids, emulsion coating formulated to bridge and fill porous surfaces of exterior concrete masonry units in preparation for specified subsequent coatings.

1. MPI #4

2.5 COATINGS:

A. Epoxy, Gloss: Solvent based, gloss, two component epoxy coating specified for floor surfaces in moderate to heavy traffic commercial and moderate industrial environments.

1. MPI #77.

B. Light Industrial Water Based Coating, Gloss Level 6: Pigmented, water-based emulsion coating for interior primed wood and metal surfaces, providing resistance to moderate abrasion and mild chemical exposure and corrosive conditions.

1. MPI #154.

2.6 WOOD PRIMERS:

A. Interior Latex-Based Wood Primer: Waterborne-emulsion primer formulated for resistance to extractive bleeding, mold, and microbials; for hiding stains; and for use on interior wood subject to extractive bleeding.

1. MPI #39.

2.7 LATEX PAINTS:

A. Interior Latex, Higher-Sheen Flat, Gloss Level 2: Pigmented, water-based paint for use on primed/sealed wood.

1. MPI #44.

B. Interior Latex, Semi-Gloss, Gloss Level 5: Pigmented, water-based paint for use on primed/sealed interior plaster and gypsum board, and on primed CMU and galvanized metal .

1. MPI #54

C. Interior Latex, Gloss Level 6: Pigmented, water-based paint for use on primed metals.

1. MPI #114

PART 3 - EXECUTION

3.1 EXAMINATION:

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

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

1. 12 % for masonry.
2. 15% for wood.

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

D. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.

1. Beginning coating application constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION:

A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates indicated.

B. Remove plates, machined surfaces, and similar items already in place that are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
2. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.

C. Clean substrates of substances that could impair bond of paints, including dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers as required to produce paint systems indicated.

D. Concrete Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.

E. Steel Substrates: Remove rust and loose mill scale. Clean using methods recommended in writing by paint manufacturer.

F. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

G. Wood Substrates:

1. Scrape and clean knots and apply coat of knot sealer before applying primer.
2. Sand surfaces that will be exposed to view, and dust off.
3. Prime edges, ends, faces, undersides, and backsides of wood.
4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

3.3 APPLICATION:

A. Apply paints according to manufacturer's written instructions.

1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.

3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.

B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

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

E. Painting Mechanical and Electrical Work: Paint items exposed in equipment rooms, bay areas, and occupied spaces including, but not limited to, the following:

1. Mechanical Work:

a. Uninsulated metal piping. Paint piping on wall similar to scheduled finish color on adjacent wall. Paint piping near roof joists similar to scheduled finish color on adjacent roof joists.
b. Fire suppression piping.

2. Electrical Work:

a. Electrical conduit, exposed. Paint conduit on adjacent wall similar to scheduled finish color on wall. Terminate paint at ceiling.

F. Painting Structural Steel: Columns, beams, girders, girts, sub-girts, cross bracing and open web joists.

3.4 FIELD QUALITY CONTROL:

A. Contractor shall touch up and restore painted surfaces damaged during construction.

3.5 CLEANING AND PROTECTION:

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project Site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

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

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

3.6 INTERIOR PAINTING SCHEDULE:

A. Concrete Slab:

1. Epoxy System:

   a. Prime Coat: Epoxy, to match topcoat.
   b. Intermediate Coat: Epoxy, to match topcoat.
   c. Topcoat: Epoxy, gloss. (MPI #77)

B. CMU Substrates:

1. Latex System:

   a. Block Filler: Block filler, latex, interior.
   b. Intermediate Coat: Interior latex to match topcoat.
   c. Topcoat: Latex, interior, semi-gloss, Gloss Level 5.

C. Steel Substrates:

1. Structural Steel and Steel Joists:

   a. Prime Coat: Zinc rich organic primer.
   b. Intermediate Coat: Interior latex to match topcoat.
   c. Topcoat: Interior latex, gloss, Gloss Level 6.

2. Steel Doors and Frames, and Steel Window:

   a. Primer Coat: Galvanized water-based primer.
   b. Intermediate Coat: Interior latex to match topcoat.
   c. Topcoat: Interior latex, gloss, Gloss Level 6.

3. Steel Piping:

   a. Primer Coat: Rust-inhibitive water-based primer.
   b. Intermediate Coat: Interior light industrial coating to match topcoat.
   c. Topcoat: Interior light industrial coating, gloss, Gloss Level 6

D. Galvanized-Metal Substrates:

1. Latex over Waterbourne Primer System:

a. Prime Coat: Galvanized water based primer.
b. Intermediate Coat: Interior latex to match topcoat.
c. Topcoat: Latex, interior, semi-gloss, Gloss Level 5.

E. Wood Substrates:

1. Latex System:

a. Prime Coat: Primer, latex based, for interior wood.
b. Intermediate Coat: Latex, interior to match topcoat.
c. Topcoat: Latex, interior, higher-sheen flat, Gloss Level 2

END OF SECTION 099123