SECTION 051213 - ARCHITECTURALLY EXPOSED STRUCTURAL STEEL FRAMING

Revise this Section by deleting and inserting text to meet Project-specific requirements.

1. GENERAL
	* + 1. RELATED DOCUMENTS

Retain or delete this article in all Sections of Project Manual.

* + - * 1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
			1. SUMMARY
				1. Section Includes:

Architecturally exposed structural steel (AESS).

Section 051200 "Structural Steel Framing" requirements that also apply to AESS.

* + - 1. DEFINITIONS

Retain terms that remain after this Section has been edited for a project.

* + - * 1. AESS: Architecturally exposed structural steel.

"Category AESS 1," "Category AESS 2," "Category AESS 3," "Category AESS 4," and "Category AESS C" paragraphs below define categories of AESS that AISC recommends be used to differentiate levels of importance based on degree of visibility.

* + - * 1. Category AESS 1: Structural steel that is categorized by ANSI/AISC 303, Section 10, as AESS 1 and may be designated AESS 1 or Category AESS 1 in the Contract Documents.
				2. Category AESS 2: Structural steel that is categorized by ANSI/AISC 303, Section 10, as AESS 2 and is designated as AESS 2 or Category AESS 2 in the Contract Documents.
				3. Category AESS 3: Structural steel that is categorized by ANSI/AISC 303, Section 10, as AESS 3 and is designated as AESS 3 or Category AESS 3in the Contract Documents.
				4. Category AESS 4: Structural steel that is categorized by ANSI/AISC 303, Section 10, as AESS 4 and is designated as AESS 4 or Category AESS 4 in the Contract Documents.

Insert new designations to supplement "Category AESS C" Paragraph below if more than one custom category is proposed. Customization may include changing, subtracting, or adding requirements to recognized AESS categories.

* + - * 1. Category AESS C: Structural steel with custom characteristics that is categorized by ANSI/AISC 303, Section 10, as AESS C and is designated as AESS C or Category AESS C in the Contract Documents.
				2. SEAC/RMSCA Guide Specification: SEAC/RMSCA's "Sample Specification, Section 05 02 13: Architecturally Exposed Structural Steel."
			1. COORDINATION

Retain this article if primers are specified in this Section rather than in painting Sections.

* + - * 1. Coordinate surface preparation requirements for shop-primed items.
				2. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
			1. PREINSTALLATION MEETINGS

Retain "Preinstallation Conference" Paragraph below if Work of this Section is extensive or complex enough to justify a conference.

* + - * 1. Preinstallation Conference: A minimum of 14 days prior to the initial submission of shop drawings, a meeting will be held at the Site for the purpose of reviewing the Contract Documents and discussing the requirements and procedures for submittals and for the Work. The meeting will be conducted by the Director’s Representative. The Contractor and the fabricator’s project coordinator and certified welding inspector must attend the meeting. The Director’s Representative and a representative of OGS D&C Structural Engineering will also attend.
			1. SUBMITTALS
				1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
				2. Manufacturer’s installation instructions shall be provided along with product data.
				3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
				4. Product Data:

Tension-control, high-strength, bolt-nut-washer assemblies.

Corrosion-resisting (weathering steel), tension-control, high-strength, bolt-nut-washer assemblies.

Filler.

Primer.

Galvanized-steel primer.

Etching cleaner.

Galvanized repair paint.

USE PARAGRAPH BELOW WITH EPD REQUIREMENT WHEN PROJECT ESTIMATE IS $1M OR MORE.

* + - * 1. Submit an Environmental Product Declaration (EPD) from the manufacturer for structural steel within this specification section, if available. A statement of the contractor’s good faith effort to obtain the EPD shall be provided if not available.

Manufacturer-provided EPDs must be Product Specific Type III (Third-Party Reviewed), in adherence with ISO 14025 *Environmental labels and declarations*, ISO 14044 *Environmental management – Life cycle assessment*, and ISO 21930 *Core rules for environmental product declarations of construction products and services.*

* + - * 1. Shop Drawings: Show fabrication of AESS components.**[ Shop Drawings for structural steel may be used for AESS.]**

Identify AESS category for each steel member and connection, including transitions between AESS categories and between AESS and non-AESS.

Include details of cuts, connections, splices, camber, holes, and other pertinent data.

Include embedment Drawings.

Indicate orientation of mill marks and HSS seams.

Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.**[ Indicate grinding, finish, and profile of welds.]**

Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical, high-strength bolted connections. Indicate orientation and location of bolt heads.

Indicate exposed surfaces and edges and surface preparation being used.

Indicate special tolerances and erection requirements.

Indicate weep holes for HSS [and vent holes for galvanized HSS].

Indicate surface preparation, primer, and coating requirements, including systems specified in other Sections.

Samples required in "Samples" Paragraph below can be used as quality standards in place of mockups for AESS 1 and AESS 2 according to ANSI/AISC 303, Section 10. Coordinate with requirements of AESS categories specified.

* + - * 1. Samples: Submit Samples to set quality standards for AESS.

Subparagraphs below are examples only. Revise to include other samples identified in SEAC/RMSCA's "Sample Specification, Section 05 02 13: Architecturally Exposed Structural Steel," such as appearance of continuous welds, eased-ground edges, surface preparation, fabrication mark removal, and weld show through.

Two steel plates, 3/8 by 8 by 4 inches, with long edges joined by a groove weld**[ and with weld ground smooth]**.

Steel plate, 3/8 by 8 by 8 inches, with one end of a short length of rectangular steel tube, 4 by 6 by 3/8 inches, welded to plate with a continuous fillet weld**[ and with weld ground smooth and blended]**.

Round steel tube or pipe, minimum 8 inches in diameter, with end of another round steel tube or pipe, approximately 4 inches in diameter, welded to its side at a 45-degree angle with a continuous fillet weld**[ and with weld ground smooth and blended]**.

Coordinate "Qualification Data" Paragraph below with qualification requirements in "Quality Assurance" Article. Retain options below that apply to this Section but do not apply to Section 051200 "Structural Steel Framing."

* + - * 1. Qualification Data: For **[Installer] [fabricator] [shop-painting applicator]**.

Consider retaining "Paint Compatibility Certificates" Paragraph below if primers are specified in this Section rather than in painting Sections.

* + - * 1. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.
				2. Mill test reports for structural-steel materials, including chemical and physical properties.
				3. Product Test Reports: For the following:

Revise list below to suit Project. Insert alternative design bolts if required.

Bolts, nuts, and washers, including mechanical properties and chemical analysis.

Direct-tension indicators.

Tension-control, high-strength, bolt-nut-washer assemblies.

Shear stud connectors.

* + - * 1. Survey of existing conditions.

Retain "Source quality-control reports" Paragraph below if Contractor is responsible for source quality-control testing and inspecting.

* + - * 1. Source quality-control reports.

Use subparagraph below for projects over $100,000. See Article 1.6. below.

Documentation to confirm compliance with General Conditions Article 25.4 Domestic Steel.

Retain "Field quality-control reports" Paragraph below if Contractor is responsible for field quality-control testing and inspecting.

* + - * 1. Field quality-control reports.
			1. QUALITY ASSURANCE
				1. Fabricator Qualifications: The fabricator of the structural steel shall be regularly engaged in the fabrication of structural steel for a minimum of 5 years and shall be subject to the approval of the Director.

AISC Quality Certified Fabricators (latest list issued) are approved.

* + - * 1. Installer Qualifications: The structural steel erector shall be regularly engaged in the erection of structural steel for a minimum of 5 years, and shall be subject to the approval of the Director.

Retain "Shop-Painting Applicators" Paragraph below if requirements for shop-painting applicators in this Section exceed those in Section 051200 "Structural Steel Framing." Qualifications below are usually for high-performance coatings rather than for customary shop priming. Before retaining, verify that fabricators or shop-painting applicators serving Project area are qualified. AISC's Sophisticated Paint Endorsement qualifies fabricators as an endorsement to plant certification; SSPC-QP 3 usually qualifies paint shops rather than steel fabricators. AISC's Sophisticated Paint Endorsement is based on industry standards and manufacturers' storage, surface preparation, application, and curing requirements; P1 is for enclosed facilities, P2 for covered facilities, and P3 for outside facilities.

* + - * 1. Shop-Painting Applicators: Qualified according to AISC's Sophisticated Paint **[Endorsement P1] [Endorsement P2] [Endorsement P3]** or SSPC-QP 3.

If retaining "Mockups" Paragraph below, indicate location, size, and other details of mockups on Drawings or by inserts. ANSI/AISC 303, Section 10 considers mockups unnecessary for AESS 1, optional for AESS 2, and required for AESS 3, AESS 4, and AESS C.

* + - * 1. Mockups: Build mockups of AESS to set quality standards for fabrication and installation.

Coordinate painting requirements with **[Section 099123 "Interior Painting."]**

Coordinate high-performance coatings requirements with Section 099600 "High-Performance Coatings."

Retain subparagraph below if the may be allowed to remain.

Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

Use paragraph below for projects over $100,000. Paragraph is taken from Article 25.4 of the General Conditions.

* + - * 1. If the value of the contract exceeds $100,000 all structural steel, reinforcing steel and other major steel items to be incorporated in the Work of this Contract shall be produced and made in whole or substantial part in the United States, its territories or possessions.
			1. DELIVERY, STORAGE, AND HANDLING
				1. Use special care in handling AESS to prevent twisting, warping, nicking, and other damage during fabrication, delivery, and erection. Store materials to permit easy access for inspection and identification. Keep AESS members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect AESS members and packaged materials from corrosion and deterioration.

Do not store AESS 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. FIELD CONDITIONS
				1. Field Measurements: Where AESS is indicated to fit against other construction, verify actual dimensions by field measurements before fabrication.
1. PRODUCTS
	* + 1. PERFORMANCE REQUIREMENTS
				1. Comply with requirements of ANSI/AISC 303, Sections 1 through 9 and as modified in Section 10, "Architecturally Exposed Structural Steel."
			2. BOLTS, CONNECTORS, AND ANCHORS

Retain this article only for those materials that apply to AESS and are not specified in Section 051200 "Structural Steel Framing."

Tension-control (twist-off) bolt assemblies in "Tension-Control, High-Strength, Bolt-Nut-Washer Assemblies" and "Corrosion-Resisting (Weathering) Steel, Tension-Control, High-Strength, Bolt-Nut-Washer Assemblies" paragraphs below correspond to strength of ASTM F3125, Grade A325 bolts; retain if round-head bolts are required.

* + - * 1. Tension-Control, High-Strength, Bolt-Nut-Washer Assemblies: ASTM F3125, Grade F1852, Type 1, round-head assemblies consisting of steel structural bolts with splined ends; ASTM A563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F436, Type 1, hardened carbon-steel washers.

Retain one option in "Finish" Subparagraph below.

Finish: **[Plain] [Mechanically deposited zinc coating]**.

* + - * 1. Corrosion-Resisting (Weathering) Steel, Tension-Control, High-Strength, Bolt-Nut-Washer Assemblies: ASTM F3125, Grade F1852, Type 3, round-head assemblies consisting of steel structural bolts with splined ends; ASTM A563, Grade DH3, heavy-hex carbon-steel nuts; and ASTM F436, Type 3, hardened carbon-steel washers.
				2. Zinc-Coated High-Strength A325 Bolts, Nuts, and Washers: ASTM F3125, Grade A325, Type 1, heavy-hex steel structural bolts; ASTM A563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F436, Type 1, hardened carbon-steel washers.

Finish: **[Hot-dip zinc coating] [Mechanically deposited zinc coating] [Hot-dip or mechanically deposited zinc coating]**.

Direct-Tension Indicators: ASTM F959, Type 325-1, compressible-washer type with **[mechanically deposited zinc coating] [mechanically deposited zinc coating, baked epoxy-coated]** finish.

* + - 1. FILLER
				1. Polyester filler intended for use in repairing dents in automobile bodies.
			2. PRIMER
				1. Steel Primer:

Retain one of three subparagraphs below.

Comply with **[099123 "Interior Painting."] [Section 099600 "High-Performance Coatings."]**

SSPC-Paint 23 below requires SSPC-SP 6(WAB)/NACE WAB-3 surface preparation or better and 24 hours' drying before recoating. SSPC recommends two primer coats before exposing steel to exterior, and one or two topcoats.

SSPC-Paint 23, latex primer.

Fabricator's standard primer below requires SSPC-SP 2 surface preparation or better and usually provides minimal protection.

Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.

* + - * 1. Galvanized-Steel Primer: **[MPI#26] [MPI#80] [MPI#134]**.

Etching Cleaner: MPI#25, for galvanized steel.

Galvanizing Repair Paint: **[MPI#18, MPI#19, or SSPC-Paint 20] [ASTM A780]**.

* + - 1. FABRICATION
				1. Shop fabricate and assemble AESS to the maximum extent possible. Locate field joints at concealed locations if possible. Detail assemblies to minimize handling and to expedite erection.

Use special care handling and fabricating AESS before and after shop painting to minimize damage to shop finish.

Retain "Category AESS 1," "Category AESS 2," "Category AESS 3," and "Category AESS 4" paragraphs below as applicable to Project. Projects may require more than a single AESS category. AESS category paragraphs below are based on ANSI/AISC 303, Section 10 requirements and generally follow the sequence outlined in Table 10.1, "AESS Category Matrix." Applicable Section 10 provisions have been added when not outlined in Table 10.1.

* + - * 1. Category AESS 1:

Comply with overall profile dimensions of AWS D1.1 for welded built-up members. Keep appearance and quality of welds consistent. Maintain true alignment of members without warp exceeding specified tolerances.

Prepare surfaces according to Part 2 "Shop Priming" Article and SSPC-SP 6 (WAB)/NACE WAB-3.

Grind sheared, punched, and flame-cut edges to remove burrs and provide smooth surfaces and eased edges.

Make intermittent welds appear continuous, using filler or additional welding.

Seal weld open ends of hollow structural sections with 3/8-inch closure plates.

Limit butt and plug weld projections to 1/16 inch.

Install bolt heads on the same side of each connection and maintain orientation consistently from one connection to another.

Remove weld spatter, slivers, and similar surface discontinuities.

Remove blemishes and surface irregularities resulting from temporary braces or fixtures by filling or grinding, before cleaning, treating, and shop priming.

Grind tack welds smooth unless incorporated into final welds.

Remove backing and runoff tabs, and grind welds smooth.

* + - * 1. Category AESS 2:

Subparagraphs below repeat requirements from "Category AESS 1" Paragraph above supplemented by Category AESS 2 special requirements.

Comply with overall profile dimensions of AWS D1.1 for welded built-up members. Keep appearance and quality of welds consistent. Maintain true alignment of members without warp exceeding specified tolerances.

Prepare surfaces according to Part 2 "Shop Priming" Article and SSPC-SP 6 (WAB)/NACE WAB-3.

Grind sheared, punched, and flame-cut edges to remove burrs and provide smooth surfaces and eased edges.

Make intermittent welds appear continuous, using filler or additional welding.

Seal weld open ends of hollow structural sections with 3/8-inch closure plates.

Limit butt and plug weld projections to 1/16 inch.

Install bolt heads on the same side of each connection and maintain orientation consistently from one connection to another.

Remove weld spatter, slivers, and similar surface discontinuities.

Remove blemishes and surface irregularities resulting from temporary braces or fixtures by filling or grinding, before cleaning, treating, and shop priming.

Grind tack welds smooth unless incorporated into final welds.

Remove backing and runoff tabs, and grind welds smooth.

Limit as-fabricated straightness tolerance to one-half that permitted for structural-steel materials in ANSI/AISC 303.

Limit as-fabricated curved structural steel tolerance to that permitted for structural-steel materials in ANSI/AISC 303.

Limit as-fabricated straightness tolerance of welded built-up members to one-half that permitted by AWS D1.1.

Conceal fabrication and erection markings from view in the completed structure.

Make welds uniform and smooth.

* + - * 1. Category AESS 3:

Subparagraphs below repeat requirements from "Category AESS 1" and "Category AESS 2" paragraphs above supplemented by Category AESS 3 special requirements.

Comply with overall profile dimensions of AWS D1.1 for welded built-up members. Keep appearance and quality of welds consistent. Maintain true alignment of members without warp exceeding specified tolerances.

Prepare surfaces according to Part 2 "Shop Priming" Article and SSPC-SP 6 (WAB)/NACE WAB-3.

Grind sheared, punched, and flame-cut edges to remove burrs and provide smooth surfaces and eased edges.

Make intermittent welds appear continuous, using filler or additional welding.

Seal weld open ends of hollow structural sections with 3/8-inch closure plates.

Limit butt and plug weld projections to 1/16 inch.

Install bolt heads on the same side of each connection and maintain orientation consistently from one connection to another.

Remove weld spatter, slivers, and similar surface discontinuities.

Remove blemishes and surface irregularities resulting from temporary braces or fixtures by filling or grinding, before cleaning, treating, and shop priming.

Grind tack welds smooth unless incorporated into final welds.

Remove backing and runoff tabs, and grind welds smooth.

Limit as-fabricated straightness tolerance to one-half that permitted for structural-steel materials in ANSI/AISC 303.

Limit as-fabricated curved structural steel tolerance to that permitted for structural-steel materials in ANSI/AISC 303.

Limit as-fabricated straightness tolerance of welded built-up members to one-half that permitted by AWS D1.1.

Conceal fabrication and erection markings from view in the completed structure.

Make welds uniform and smooth.

Cut out mill marks from mill material or hide these markings from view in the completed structure. Where neither method is possible, remove mill marks by grinding and filling surfaces as approved by Director’s Representative.

Grind butt and plug welds smooth or fill, removing weld splatter exposed to view.

Orient HSS seams as indicated or away from view.

Align and match abutting member cross sections.

At visible open joints of copes, miters, and cuts, maintain uniform clear gaps of 1/8 inch. At closed joints, maintain uniform contact within 1/16 inch.

Fabricate with exposed surfaces smooth, square, and of surface quality approved by Director’s Representative.

* + - * 1. Category AESS 4:

Subparagraphs below repeat requirements from "Category AESS 1," "Category AESS 2," and "Category AESS 3" paragraphs above supplemented by Category AESS 4 special requirements.

Comply with overall profile dimensions of AWS D1.1 for welded built-up members. Keep appearance and quality of welds consistent. Maintain true alignment of members without warp exceeding specified tolerances.

Prepare surfaces according to Part 2 "Shop Priming" Article and SSPC-SP 6 (WAB)/NACE WAB-3.

Grind sheared, punched, and flame-cut edges to remove burrs and provide smooth surfaces and eased edges.

Make intermittent welds appear continuous, using filler or additional welding.

Seal weld open ends of hollow structural sections with 3/8-inch closure plates.

Limit butt and plug weld projections to 1/16 inch.

Install bolt heads on the same side of each connection and maintain orientation consistently from one connection to another.

Remove weld spatter, slivers, and similar surface discontinuities.

Remove blemishes and surface irregularities resulting from temporary braces or fixtures by filling or grinding, before cleaning, treating, and shop priming.

Grind tack welds smooth unless incorporated into final welds.

Remove backing and runoff tabs, and grind welds smooth.

Limit as-fabricated straightness tolerance to one-half that permitted for structural-steel materials in ANSI/AISC 303.

Limit as-fabricated curved structural steel tolerance to that permitted for structural-steel materials in ANSI/AISC 303.

Limit as-fabricated straightness tolerance of welded built-up members to one-half that permitted by AWS D1.1.

Conceal fabrication and erection markings from view in the completed structure.

Make welds uniform and smooth.

Cut out mill marks from mill material or hide these markings from view in the completed structure. Where neither method is possible, remove mill marks by grinding and filling surfaces as approved by Director’s Representative.

Grind butt and plug welds smooth or fill, removing weld splatter exposed to view.

Orient HSS seams as indicated or away from view.

Align and match abutting member cross sections.

At visible open joints of copes, miters, and cuts, maintain uniform clear gaps of 1/8 inch. At closed joints, maintain uniform contact within 1/16 inch.

Fabricate with exposed surfaces smooth, square, and of surface quality approved by Director’s Representative.

Treat HSS seams to appear seamless.

Contour and blend welds and weld transitions between members, removing splatter exposed to view.

Fill surface imperfections with filler and sand smooth to achieve surface quality approved by Director’s Representative.

Minimize weld show-through and distortion on the opposite side of exposed connections by grinding to a smooth profile aligned with adjacent material.

Insert "Category AESS C "Paragraph here, if applicable, along with a list of requirements. Category AESS C custom requirements may be selectively chosen from those identified in other AESS categories or be specially developed for the Project.

Retain first paragraph below for galvanized or corrosion-resisting (weathering) AESS. If unacceptable, specify special requirements in AESS C supplemented by requirements from other AESS categories. Markings on unfinished, reused, galvanized- or corrosion-resisting (weathering) steel surfaces of completed structure are permitted by ANSI/AISC 303, Section 10.

* + - * 1. Erection marks, painted marks, and other marks are permitted on **[galvanized-] [corrosion-resisting (weathering)]** steel surfaces of completed structure.

Retain "Cleaning Corrosion-Resisting (Weathering) AESS" Paragraph below if applicable.

* + - * 1. Cleaning Corrosion-Resisting (Weathering) AESS: Clean and prepare steel surfaces that are to remain unpainted according to SSPC-SP 6 (WAB)/NACE WAB-3.
			1. SHOP CONNECTIONS
				1. 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.

RCSC requires that joint types be specified in the Contract Documents for most loading conditions. See the Evaluations for a discussion of the joint type options in "Joint Type" Subparagraph below, the three types RCSC now recognizes. Insert particular bolt-pretensioning method for pretensioned or slip-critical joints if required; RCSC states that each type can provide satisfactory results.

Joint Type: **[Snug tightened] [Pretensioned] [Slip critical]**.

Retain option in "Weld Connections" Paragraph below for "high-seismic applications" as defined in ANSI/AISC 360.

* + - * 1. Weld Connections: Comply with AWS D1.1**[ and AWS D1.8]** for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
			1. GALVANIZING

Retain this article if galvanizing of AESS is required but not retained in Section 051200 "Structural Steel Framing." Hot-dip galvanizing may cause some distortion (warping), especially with small steel members This distortion may complicate compliance with stricter AESS fabrication tolerances.

* + - * 1. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel according to ASTM A123.

Retain first subparagraph below if galvanized steel is painted.

Do not quench or apply post-galvanizing treatments that might interfere with paint adhesion.

Fill vent and drain holes that are exposed in the finished Work, unless indicated to remain as weep holes, by plugging with zinc solder and filing off smooth.

Revise locations in subparagraph below where galvanizing is required to suit Project. Subparagraph is an example only; delete and indicate items to be galvanized on Drawings if preferred.

Galvanize AESS **[lintels] <Insert description>** attached to structural-steel frame and located in exterior walls.

* + - 1. SHOP PRIMING

Retain this article if shop priming is required and is different from that specified in Section 051200 "Structural Steel Framing."

* + - * 1. Shop prime steel surfaces, except the following:

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

Surfaces to be field welded.

Surfaces to be high-strength bolted with slip-critical connections.

Corrosion-resisting (weathering) steel surfaces.

Galvanized surfaces **[unless indicated to be painted]**.

* + - * 1. Surface Preparation: Clean nongalvanized 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:

Retain surface-preparation standards in nine subparagraphs below or revise to suit Project. ANSI/AISC 303, Section 10 sets default surface preparation as SSPC-SP 6 (WAB)/NACE WAB-3. Surface-preparation options below are listed in case other preparation levels are appropriate to different AESS categories. Coordinate minimum surface-preparation requirements with selection of primers, paint, and coating systems.

"SSPC-SP 2" and "SSPC-SP 3" subparagraphs below require complete removal of loose rust, mill scale, and paint. SSPC-SP 2 is minimum surface preparation accepted by AISC for painted non-AESS.

SSPC-SP 2.

SSPC-SP 3.

"SSPC-SP 7 (WAB)/NACE WAB-4" Subparagraph below permits tight residues of rust, mill scale, and coatings to remain.

SSPC-SP 7 (WAB)/NACE WAB-4.

"SSPC-SP 14 (WAB)/NACE WAB-8" Subparagraph below exceeds SSPC-SP 7 (WAB)/NACE WAB-4 requirements but is less strict than cleaning specified in SSPC-SP 6 (WAB)/NACE WAB-3.

SSPC-SP 14 (WAB)/NACE WAB-8.

"SSPC-SP 11" Subparagraph below requires complete removal of rust, mill scale, and paint by power tools. SSPC-SP 11 uses nonabrasive methods and bridges the gap between the marginal cleaning required in SSPC-SP 2, SSPC-SP 3, and SSPC-SP 7 (WAB)/NACE WAB-4, and the more thorough cleaning required in SSPC-SP 6 (WAB)/NACE WAB-3, SSPC-SP 10 (WAB)/NACE WAB-2, and SSPC-SP 5 (WAB)/NACE WAB-1.

SSPC-SP 11.

"SSPC-SP 6 (WAB)/NACE WAB-3" Subparagraph below requires that two-thirds of surface area be free of visible residue.

SSPC-SP 6 (WAB)/NACE WAB-3.

"SSPC-SP 10 (WAB)/NACE WAB-2" Subparagraph below requires that 95 percent of surface area be free of visible residue.

SSPC-SP 10 (WAB)/NACE WAB-2.

"SSPC-SP 5 (WAB)/NACE WAB-1" Subparagraph below requires complete removal of visible rust, mill scale, paint, and foreign matter.

SSPC-SP 5 (WAB)/NACE WAB-1.

"SSPC-SP 8" Subparagraph below requires complete removal of rust and mill scale by acid, duplex, or electrolytic pickling. Pickling is not widely available.

SSPC-SP 8.

* + - * 1. Preparing Galvanized Steel for Shop Priming: After galvanizing, thoroughly clean steel of grease, dirt, oil, flux, and other foreign matter, and treat with etching cleaner [or according to SSPC-SP 16].
				2. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

Retain first subparagraph below if "Priming" Paragraph above does not suffice. Stripe painting adds cost but helps ensure that hard-to-reach areas, such as crevices, inside corners, and welds, are thoroughly coated.

Stripe paint corners, crevices, bolts, welds, and eased edges.

Apply two coats of shop paint to surfaces that are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.

1. EXECUTION
	* + 1. EXAMINATION
				1. Verify, with steel erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.

Prepare a certified survey of bearing surfaces, anchor rods, bearing plates, and other embedments, showing dimensions, locations, angles, and elevations.

* + - * 1. Examine AESS for twists, kinks, warping, gouges, and other imperfections before erecting.
				2. Proceed with installation only after unsatisfactory conditions have been corrected.
			1. PREPARATION
				1. Provide temporary shores, guys, braces, and other supports during erection to keep AESS 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.
			2. ERECTION

Requirements in first paragraph below are based on the erection requirements of ANSI/AISC 303, Section 10 and apply to each AESS category.

* + - * 1. Take special care during erection to avoid marking or distorting the AESS and to minimize damage to shop painting. Set AESS accurately in locations and to elevations indicated and according to ANSI/AISC 303 and ANSI/AISC 360.

Remove welded tabs that were used for attaching temporary bracing and safety cabling and that are exposed to view in the completed Work. Take care to avoid any blemishes, holes, or unsightly surfaces resulting from the use or removal of temporary elements.

Grind tack welds smooth.

Remove backing and runoff tabs, and grind welds smooth.

Orient bolt heads on the same side of each connection and maintain orientation consistently from one connection to another.

Remove erection bolts in **[Category AESS 4] <Insert category>** AESS, fill holes with weld metal or filler, and grind or sand smooth to achieve surface quality approved by Director’s Representative.

Fill weld access holes in **[Category AESS 4] <Insert category>** AESS with weld metal or filler and grind, or sand smooth to achieve surface quality as approved by Director’s Representative.

Conceal fabrication and erection markings from view in the completed structure.

Retain paragraph below if additional requirements, identified in SEAC/RMSCA's "Sample Specification, Section 05 02 13: Architecturally Exposed Structural Steel," apply to the erection of AESS.

* + - * 1. In addition to ANSI/AISC 303, Section 10 requirements, comply with the following.

Erection of **[Category AESS 1] [and Category AESS 2]**:

Subparagraphs below include additional SEAC/RMSCA erection requirements for both Category AESS 1 and Category AESS 2.

Erect AESS to the standard frame tolerances specified in ANSI/AISC 303 for non-AESS.

Comply with AWS D1.1. Keep appearance and quality of welds consistent. Maintain true alignment of members without warp exceeding specified tolerances.

Remove weld spatter, slivers, and similar surface discontinuities.

Grind off butt and plug weld projections larger than 1/16 inch.

Continuous welds shall be of uniform size and profile.

Ream holes that must be enlarged. Use of drift pins or burning is not permitted. Replace misaligned connection plates where holes cannot be aligned with acceptable appearance.

Splice members only where indicated on Drawings.

No torch cutting or field fabrication is permitted.

Erection of Category AESS 3:

Subparagraphs below repeat erection requirements identified by SEAC/RMSCA for Category AESS 1 and Category AESS 2 followed by Category AESS 3 erection requirements.

Erect AESS to the standard frame tolerances specified in ANSI/AISC 303 for non-AESS.

Comply with AWS D1.1. Keep appearance and quality of welds consistent. Maintain true alignment of members without warp exceeding specified tolerances.

Remove weld spatter, slivers, and similar surface discontinuities.

Grind off butt and plug weld projections larger than 1/16 inch.

Continuous welds shall be of uniform size and profile.

Ream holes that must be enlarged. Use of drift pins or burning is not permitted. Replace misaligned connection plates where holes cannot be aligned with acceptable appearance.

Splice members only where indicated on Drawings.

No torch cutting or field fabrication is permitted.

Weld profiles, quality, and finish shall be as approved by Director’s Representative.

Make joint welds, including tack welds, appear continuous by filling intermittent welds.

Erection of Category AESS 4:

Subparagraphs below repeat erection requirements identified by SEAC/RMSCA for Category AESS 1, Category AESS 2, and Category AESS 3 followed by Category AESS 4 erection requirements.

Erect AESS to the standard frame tolerances specified in ANSI/AISC 303 for non-AESS.

Comply with AWS D1.1. Keep appearance and quality of welds consistent. Maintain true alignment of members without warp exceeding specified tolerances.

Remove weld spatter, slivers, and similar surface discontinuities.

Grind off butt and plug weld projections larger than 1/16 inch.

Continuous welds shall be of uniform size and profile.

Ream holes that must be enlarged. Use of drift pins or burning is not permitted. Replace misaligned connection plates where holes cannot be aligned with acceptable appearance.

Splice members only where indicated on Drawings.

No torch cutting or field fabrication is permitted.

Weld profiles, quality, and finish shall be as approved by Director’s Representative.

Make joint welds, including tack welds, appear continuous by filling intermittent welds.

Grind welds smooth.

Minimize weld show-through and distortion on the opposite side of exposed connections by grinding to a smooth profile aligned with adjacent material.

Oversize welds where ground, contoured, or blended, and grind to provide a smooth transition, matching profile approved by Director’s Representative.

Retain "Erection of Category AESS C" Subparagraph below if applicable and insert special requirements.

Erection of Category AESS C:

**<Insert requirements>**.

* + - 1. FIELD CONNECTIONS
				1. 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.

RCSC requires that joint types be specified in the Contract Documents for most loading conditions. See the Evaluations for a discussion of the joint type options in "Joint Type" Subparagraph below, the three joint types RCSC now recognizes. Insert particular bolt-pretensioning method for pretensioned or slip-critical joints if required; RCSC states that each type can provide satisfactory results.

Joint Type: **[Snug tightened] [Pretensioned] [Slip critical]**.

Retain option in "Weld Connections" Paragraph below for "high-seismic applications" as defined in ANSI/AISC 360.

* + - * 1. Weld Connections: Comply with AWS D1.1**[ and AWS D1.8]** for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
			1. REPAIR
				1. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas, and touchup galvanizing to comply with ASTM A780.
				2. Touchup Painting:

Retain first subparagraph below if on-site paint repair is included in this Section.

Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop painting, to comply with SSPC-PA 1 for touching up shop-painted surfaces.

Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.

Retain subparagraph below if touchup painting is required for Project but is not part of the Work of this Section.

Cleaning and touchup painting are specified in **[Section 099123 "Interior Painting."] [Section 099600 "High-Performance Coatings."]**

Retain "Touchup Priming" Paragraph below if touchup painting is required for Project but is not part of the Work of this Section.

* + - * 1. Touchup Priming: Cleaning and touchup priming are specified in Section 099600 "High-Performance Coatings."
			1. FIELD QUALITY CONTROL

Special inspections are specified in Section 051200 "Structural Steel Framing."

Retain "Testing Agency" Paragraph below to identify who shall perform tests and inspections.

* + - * 1. Special Inspections: Director’s Representative will engage a special inspector and a qualified testing agency to perform tests and inspections in accordance with the requirements of BDC 406 Summary of Special Inspections and BDC 406.1 Statement of Special Inspections and as directed by the Code Compliance Manager. If additional requirements are not stipulated for AESS, follow the requirements for 051200 “Structural Steel Framing.” The testing agency is not responsible for enforcing requirements relating to aesthetic effect.
				2. Architect and Director’s Representative will observe AESS in place to determine acceptability relating to aesthetic effect.

END OF SECTION 051213