

Silverdale Recycling and Garbage Facility Rail Track Contract Documents

Prepared for



July 2023

Prepared by

Parametrix

Silverdale Recycling and Garbage Facility Rail Track Contract Documents

Prepared for

Kitsap County

614 Division Street
MS 34, Room 202
Port Orchard, WA 98366

Prepared by

Parametrix

1019 39th Avenue SE, Suite 100
Puyallup, WA 98374
T. 253.604.6600 F. 1.855.542.6353
www.parametrix.com

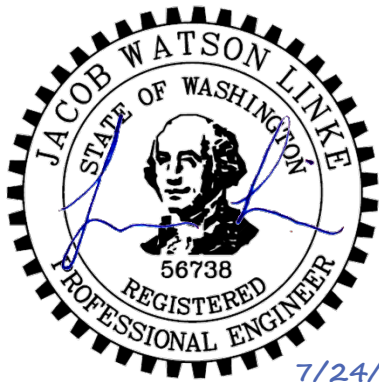
July 2023

Parametrix No. 214-1578-161

This Page Intentionally Left Blank

CERTIFICATION

The technical material and data contained in this document were prepared under the supervision and direction of the undersigned, whose seal, as a professional engineer licensed to practice as such, is affixed below.



7/24/2023

Prepared by Jacob Watson Linke, PE

A blue ink signature of Steve Wagner, written over a horizontal line.

Checked by Steve Wagner, PE

A blue ink signature of Karl Hufnagel, written over a horizontal line.

Approved by Karl Hufnagel, PE

This Page Intentionally Left Blank

TABLE OF CONTENTS

<u>SECTION NO.</u>	<u>SECTION TITLE</u>
DIVISION 03	CONCRETE
03 15 19	ANCHORS, INSERTS, AND EMBEDDED PRODUCTS
03 30 01	CAST-IN-PLACE CONCRETE
03 60 00	GROUTING
DIVISION 05	METALS
05 12 20	STRUCTURAL STEEL
05 50 00	METAL FABRICATIONS

TABLE OF CONTENTS (Continued)

<u>SECTION NO.</u>	<u>SECTION TITLE</u>
--------------------	----------------------

This Page Intentionally Left Blank

Division 03
Concrete



SECTION 03 15 19
ANCHORS, INSERTS, AND EMBEDDED PRODUCTS

PART 1 – GENERAL

1.01 SUMMARY

- A. This section specifies the materials and installation requirements for metal embedment into concrete or grouted masonry.
- B. Items Included:
 - 1. Inserts for structural attachments.
 - 2. Post-installed anchors.

1.02 SUBMITTALS

- A. Shop drawings for all anchors, inserts, and embedded products.
- B. Manufacturer's Data: Submit complete data including dimensions, resins, colors, and other information.
- C. Current ICBO Evaluation Reports for all expansion and adhesive anchors.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Anchor Bolts: ASTM F1554 Grade 55 or ASTM A307, galvanized steel unless otherwise noted. Configuration shall be as shown or noted on the Drawings.
- B. Threaded or Slotted Inserts: Galvanized malleable iron or stainless steel, size and type as specified or noted elsewhere.
- C. Expansion Anchors: ICBO approved for use in cracked and uncracked concrete for all anchors used for wind or seismic anchorage applications.
 - 1. Stainless Steel:
 - a. Stud: Stainless steel bar conforming to ASTM A276 with chemical composition of either AISI 304 or 316.
 - b. Wedge: Manufactured from either AISI 304 or 316 stainless steel.
 - c. Nut: Stainless steel conforming to ASTM F594 with chemical composition of either AISI 304 or 316 and meeting dimensional requirements of ANSI B18.2.2.
 - d. Washer: AISI 304 or 316 stainless steel conforming to ASTM A240.

2. Products:
 - a. Hilti, Kwik-Bolt TZ.
 - b. Powers Fasteners, Power-Stud +.
 - c. Simpson Strong Tie, Strong-Bolt 2.
 - d. Other manufacturers upon approval of Engineer.

D. Adhesive Anchors:

1. Anchor rod material shall conform to ASTM A304 stainless steel unless ASTM A316 is called out on the Drawings.
2. Products:
 - a. Hilti, HIT-RE 500-V3.
 - b. Powers Fasteners, PE1000+.
 - c. Simpson Strong-Tie, SET-XP.
 - d. Other manufacturers upon approval of Engineer.

E. Anchors into Masonry:

1. All anchors in CMU walls shall be adhesive type anchors. Wing type hollow wall anchors shall not be permitted.
2. Provide anchors conforming to Section D above, with manufacturer's supplied screen insert for installation into masonry.

F. Stainless Steel Plates and Shapes: Conform to AISI Type 304 unless otherwise noted.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Coordinate the location and placement of all items to be embedded in concrete.
- B. Coat any embedded aluminum with asphalt paint.
- C. Adhesive and expansion anchors to be installed in holes drilled with carbide tipped drill bits. Anchors shall be installed per manufacturer's recommendations. Insert and tighten bolts in accordance with manufacturer's installation instructions. In case of interference with reinforcing bars or steel objects, notify the Engineer.

3.02 EMBEDDING

- A. Set accurately and hold in position all embedded products during placement until the concrete is set.

3.03 INSPECTION

- A. Anchors shall be inspected by Special Inspector as required by the Inspection Requirements described in the Structural General Notes contained on the Drawings or as required by the Building Official.

END OF SECTION

This Page Intentionally Left Blank

SECTION 03 30 01
CAST-IN-PLACE CONCRETE

PART 1 – GENERAL

1.01 SUMMARY

- A. This section specifies cast-in-place reinforced concrete, including embedded material and formwork.
- B. Contractor shall adhere to all requirements set within this section and the Washington State Department of Transportation (WSDOT) 2023 Standard Specifications Section 6-11.3(4).

1.02 QUALITY ASSURANCE

- A. Referenced Standards: This section incorporates by reference the latest revision of the following document. It is a part of this section as specified and modified. In case of conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.

<u>Reference</u>	<u>Title</u>
ACI 301	Specifications for Structural Concrete for Buildings
ACI 318	Building Code Requirements for Reinforced Concrete
ASTM A615	Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
ASTM C33	Specification for Concrete Aggregates
ASTM C94	Specification for Ready-Mixed Concrete
ASTM C150	Specification for Portland Cement
ASTM E329	Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction Manual of Standard Practice

1.03 TESTING

- A. Perform and submit materials testing to demonstrate conformance with the specifications.

1.04 SUBMITTALS

- A. Submittals to follow the requirements per Section 6-11.3(1) of the WSDOT 2023 Standard Specifications.
- B. Concrete-Mix Designs.
- C. Reinforcing Steel.
- D. Curing Compound.

1.05 CONCRETE MIX DESIGNS

A. Compressive Strengths: Unless otherwise specified, provide the following as minimum:

1. All Concrete: 5,000 psi.

PART 2 – PRODUCTS

2.01 REINFORCEMENT

A. Comply with the following as minimums:

1. Bars – ASTM A615, grade 60, unless otherwise shown, using deformed bars for Number 3 and larger.
2. Bending – ACI 318.

B. Fabricate reinforcement to the required shapes and dimensions, within fabrication tolerances stated in the CRSI.

C. Do not use reinforcement having any of the following defects:

1. Bar lengths, depths, or bends exceeding the specified fabricating tolerances.
2. Bends or kinks not indicated on the Drawings or required for this work.
3. Bars with cross-section reduced due to excessive rust or other causes.

2.02 CONCRETE

A. Minimum Requirements:

1. Portland Cement: ASTM C150, Type I or II, low-alkali.
2. Aggregate, General:
 - a. ASTM C33, uniformly graded and clean.
 - b. Do not use aggregate known to cause excessive shrinkage.
3. Aggregate, Coarse: Crushed rock or washed gravel with size between 3/4 inch and 1-1/2 inches.
4. Aggregate, Fine: Natural washed sand of hard and durable particles varying from fine to particles passing a 3/8-inch screen, of which at least 12% shall pass a 50-mesh screen.
5. Water: Clean and potable.

6. Flyash: For the cementitious portion of the concrete mix, up to 20% of the cement content may be flyash or ground granulated blast furnace slag. A higher percentage of flyash can be used if a mix design and plan for form removal is approved by the Owner.
7. Cementitious content (including fly ash or slag) not less than 564 pounds per cubic yard of concrete.
8. Entrained air 5-1/2% plus or minus 1%.
9. Maximum water/cement ratio shall be a maximum of 0.40 to reduce shrinkage cracking.

B. Admixtures:

1. Water-reducing admixtures shall conform to ASTM C494, and be used in accordance with the manufacturer's recommendations.
2. No chloride containing admixtures shall be used.

2.03 OTHER MATERIALS

- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor.

PART 3 – EXECUTION

3.01 EXISTING CONDITIONS

- A. Examine the areas and conditions under which work of this section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.02 EMBEDDED ITEMS

- A. Do not embed piping or electrical conduit in structural concrete unless indicated on the Drawings or approved by the Owner.
- B. Set and secure bolts, inserts, and other required items in the precise locations needed so these items are not displaced.
- C. Prior to concrete placement, ensure the actual locations of embedded items are noted on the as-built set of drawings.

3.03 FORMS

- A. Design, erect, support, brace, and maintain formwork to safely support vertical and lateral loads which will be applied until such loads can be supported safely by the concrete structure.
- B. Construct forms to the exact sizes, shapes, lines, and dimensions shown, and as required to obtain accurate alignment, location, grades, and level and plumb work in the finished structure.

3.04 MIXING CONCRETE

- A. Transit mix the concrete in accordance with provisions of ASTM C94.
- B. Do not use concrete that has stood for over 30 minutes after leaving the batch plant, or concrete that is not placed within 90 minutes after water is first introduced into the mix.

3.05 PLACING CONCRETE

- A. Preparation:
 - 1. Remove foreign matter accumulated in the forms.
 - 2. Rigidly close openings left in the formwork.
 - 3. Wet wood forms sufficiently to tighten up cracks; wet other material sufficiently to maintain workability of the concrete.
 - 4. Use only clean tools.
 - 5. Schedule inspection with Owner 24 hours minimum prior to concrete placement.
- B. Conveying:
 - 1. Perform concrete placing at such a rate that concrete which is being integrated with fresh concrete is still plastic.
 - 2. Deposit concrete as nearly as practicable in its final location to avoid separation due to rehandling and flowing.
 - 3. Do not use concrete which becomes non-plastic and unworkable, or does not meet required quality control limits, or has been contaminated by foreign materials.
 - 4. Remove concrete from the work site that does not meet specifications.

C. Placing Concrete in Forms:

1. Deposit concrete in horizontal layers not deeper than 24 inches and avoid inclined construction joints.
2. Remove temporary spreaders in forms when concrete has reached the elevation of the spreaders.

D. Placing Concrete Slabs:

1. Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until the placing of a panel or section is completed.
2. Bring slab surfaces to the correct level with a straightedge, and then strike off.
3. Use bullfloats or darbies to smooth the surface, leaving the surface free from bumps and hollows.
4. Do not sprinkle water on the plastic surface.
5. Do not disturb the slab surface prior to start of finishing operations.

3.06 CONSOLIDATION

- A. Consolidate each layer of concrete while placing by use of internal concrete vibrators and supplemented by hand spading, rodding, or tamping.
- B. Do not vibrate forms or reinforcement.
- C. Do not use vibrators to transport concrete inside the forms.

3.07 JOINTS

A. Construction Joints:

1. Construction joints shall be placed as shown on the Drawings. If other joints are found to be required, submit for the Owner's approval of joint design and location prior to start of concrete placement.

3.08 CONCRETE FINISHING

A. Unless otherwise indicated, provide the following finishes at the indicated locations.

1. Non-slip broom finish: apply to slabs, walks, stairs, drives, ramps, and similar pedestrian and vehicular areas.
2. Formed surfaces: repair all rock pockets, voids, air bubbles, etc. greater than 1/2 inch in any dimension.

3.09 CURING AND PROTECTION

- A. Comply with requirements of ACI 301. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
- B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
 - 1. Normal concrete: Not less than 7 days
 - 2. High early strength concrete: not less than 4 days.
- C. Formed Surfaces: Cure by moist curing with forms in place for full curing period.
- D. Surfaces not in contact with forms:
 - 1. Start initial curing as soon as free water has disappeared and before surface is dry. Keep continuously moist for specified curing period by water ponding, water-saturated sand, water-fog spray, saturated burlap, or special blankets designed for curing concrete and maintaining moist condition.
 - 2. Begin final curing after initial curing but before surface is dry.
- E. After completion of curing process, finished surface where indicated shall be protected by use of protection boards from workman, equipment, scaffolding, and other form of damage throughout subsequent construction, Size, thickness, and material of board shall be determined by Contractor. Contractor is responsible for maintaining integrity of slab finish throughout construction.

3.10 FIELD QUALITY CONTROL

- A. Be responsible for Quality Control of Work for materials, placement, curing, and finishing.
- B. Perform tests of concrete and concrete materials to ensure conformance with specified requirements per ACI 318.
- C. Compressive Strength Tests: ASTM C39. For each test, mold and cure three concrete test cylinders. Obtain test samples for every 50 cubic yards or less of concrete placed per day.

END OF SECTION

SECTION 03 60 00
GROUTING

PART 1 – GENERAL

1.01 SUMMARY

- A. This section specifies non shrink grout and epoxy grout for use in applications including but not limited to grouts for setting machine bases, and grouting under base plates. Epoxy adhesives for concrete applications including, but not limited to pressure injection of cracks and doweling of anchor bolts, threaded rod anchors and reinforcing bar dowels.

1.02 QUALITY CONTROL

- A. Referenced Standards: This section incorporates by reference the latest revision of the following documents. These references are a part of this section as specified and modified. In case of conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.

<u>Reference</u>	<u>Title</u>
ASTM C33	Concrete Aggregates
ASTM C40	Test Method for Organic Impurities in Fine Aggregates for Concrete
ASTM C88	Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C117	Test Method for Materials Finer than No. 200 Sieve in Mineral Aggregates by Washing
ASTM C136	Test Method for Sieve Analysis of Fine and Course Aggregates
ASTM C150	Portland Cement
ASTM C289	Test Method for Potential Alkali-Silica Reactivity of Aggregates (Chemical Method)
ASTM C494	Standard Specification for Chemical Admixtures for Concrete
ASTM C881	Standard for Epoxy-Resin-Base Bonding Systems for Concrete
ASTM C1017	Chemical Admixtures for Use in Producing Flowing Concrete
ASTM C1107	Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
ASTM D2419	Test Method for Sand Equivalent Value of Soils and Fine Aggregate
ASTM E329	Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction
CRD-C-621	Corps of Engineers Specification for Non-shrink Grout

1.03 SUBMITTALS

- A. Manufacturer's Data for the following:
 - 1. Non-shrink cementitious grout.
 - 2. Epoxy grout.
 - 3. Admixtures for cement grout.
 - 4. Adhesive for pressure injection of cracks.
 - 5. Adhesive for doweling.
 - 6. Bonding compounds.

PART 2 – PRODUCTS

2.01 GENERAL

- A. Grout mixes and admixtures shall not contain more than 0.05% chloride ions.
- B. Water for washing aggregate, for mixing, and for curing:
 - 1. Shall be free from oil and deleterious amounts of acids, alkalis, and organic materials
 - 2. Shall not contain more than 1,000 mg/L of chlorides as Cl, nor more than 1,300 mg/L of sulfates as SO₄.
 - 3. Shall not contain an amount of impurities that may cause a change of more than 25% in the setting time of the cement nor a reduction of more than 5% in the compressive strength of the grout at 14 days when compared with the result obtained with distilled water.
 - 4. Water used for curing shall not contain an amount of impurities sufficient to discolor the grout.

2.02 GROUT

- A. Use grout specified on the Contract Drawings or as specified in the equipment recommendations.
- B. Non-shrink cementitious grout:
 - 1. Cementitious grout that conforms to ASTM C1107, CRD-C-621, "Corps of Engineers Specification for Non-Shrink Grout", and the following requirements:
 - a. Non-metallic aggregate.

- b. Acceptable manufacturers:
 - 1) Euclid Chemical Co., “Euco NS.”
 - 2) BASF, “Masterflow 713 Plus.”
 - 3) Five Star Grout Co., “Five-Star Grout.”
 - 4) Or approved equal.

C. Epoxy Grout:

- 1. Multi-component, 100% solids compound conforming to the following requirements:
 - a. Suitable for use on dry or damp surfaces.
 - b. Comply with ASTM C881.
 - c. Acceptable manufacturer:
 - 1) Euclid Chemical Co., “DuralBond.”
 - 2) Sika Chemical Co, “Sikadur 35 Hi-Mod LV.”
 - 3) BASF, “SCB Concrecive 1380.”
 - 4) Or approved equal.

2.03 ADHESIVES

A. Adhesive for pressure injection of cracks in concrete:

- 1. A two-component, moisture tolerant, low viscosity, liquid epoxy adhesive conforming to ASTM C881 for load-bearing applications.
- 2. Acceptable manufacturers:
 - a. BASF, “SCB Concrecive 1350 or 1360.
 - b. Sika Chemical Co, “Sikadur 35 Hi-Mod LV.”
 - c. Euclid Chemical Co., “Eucopoxy Injection Resin.”
 - d. Or approved equal.

B. Adhesive for doweling of anchors and reinforcing bars in concrete:

- 1. A two-component, moisture tolerant, epoxy gel conforming to ASTM C881 for load-bearing applications.

2. Acceptable manufacturers:
 - a. Euclid Chemical Co., "Euco #452."
 - b. Sika Corporation, "Sikadur Anchor Fix-4."
 - c. Simpson Strong Tie, "Set XP."
 - d. Hilti, "HIT RE 500SD."
 - e. BASF, "SCB Concessive 1380."
 - f. Or approved equal.

PART 3 – EXECUTION

3.01 GENERAL

- A. Mix, place and cure in accordance with the manufacturer's instructions.
- B. For grouting of equipment base plates, refer to manufacturer's instructions for appropriate procedures.

3.02 EXAMINATION

- A. Inspect concrete surfaces to receive grout or mortar and verify that they are free of ice, frost, dirt, grease, oil, curing compounds, paints, impregnations, and all loose material or foreign matter likely to affect the bond or performance of grout or mortar.
- B. Inspect base plate and anchor systems for rust, oil, and other deleterious substances that may affect the bond or performance of grout.
- C. Confirm that newly placed concrete has been cured sufficiently to attain its design strength and limit further shrinkage.
- D. Verify that temperature of cementitious or epoxy grout does not exceed manufacturer's recommendations.

3.03 PREPARATION

- A. Surface Preparation:
 1. Roughen all concrete surfaces by chipping, or other mechanical means to ensure bond. Loose or broken concrete shall be removed.
 2. All grease, oil, dirt, curing compounds, laitance, and other deleterious materials that may affect bond that were identified in the inspection process shall be completely removed from concrete and bottoms of base plates. All metal surfaces should have a 2- to 3-mil peak-to-valley profile for epoxy grouts.

3. For cementitious mortars and grouts, concrete shall be saturated surface damp. Any standing water shall be removed prior to placing grouts.
4. For epoxy grouts, do not wet concrete surfaces with water. Instead, where required, wet surfaces with epoxy for horizontal work or epoxy gel for vertical or overhead work prior to placing epoxy grouts.

B. Forms and Headboxes for Cementitious or Epoxy Grouts:

1. Forms for grouts shall be built of material with adequate strength to withstand the placement of grouts.
2. Forms must be rigid and liquid tight. All cracks and joints shall be caulked with an elastomeric sealant. All forms shall be lined with polyethylene for easy grout release. Forms carefully waxed with two coats of heavy-duty paste wax shall also be acceptable.
3. Forms shall be 4 to 6 inches higher than the base plate on one side of the base plate configuration when using head pressure for placement.
4. Air relief holes a minimum 1/8 inch in diameter shall be provided when required by a base plate configuration to avoid entrapping air underneath.

3.04 NON-SHRINK CEMENTITIOUS GROUT

- A. Prepare concrete surfaces in accordance with the grout manufacturer's instructions.
- B. Do not retemper grout by adding more water after stiffening.

3.05 EPOXY GROUT

- A. Prime concrete in accordance with the grout manufacturer's instructions.
- B. Epoxy grouts shall be mixed in complete units. Do not vary the ratio of components or add solvent to change the consistency of the mix.
- C. Mix until aggregate is uniformly wetted. Over mixing will cause air entrapment in the mix.

3.06 PRESSURE INJECTION OF CRACKS

- A. Design system to permit injection of adhesive resin at pressures up to 50 psi.
- B. Injection Equipment
 1. Include a mixer and holdover agitator tanks.
 2. Provide gauges to indicate pressure used.
 3. Provide a meter capable of indicating the volume of grout used to 1/10 of a cubic foot.

3.07 DOWEL INSTALLATION

- A. Install per adhesive manufacturer's instructions.
- B. Obstructions in Drill Path.
 - 1. Locate holes in existing concrete to miss existing reinforcing. Prior to drilling holes, field verify and mark the location of existing reinforcing using a pachometer or other approved locating equipment.
 - 2. When reinforcing steel is encountered in the drill path, slant drill to clear obstruction. Drill shall not be slanted more than 10 degrees. Where slanting the drill does not resolve the conflict the Contractor shall stop and notify the Project Representative and resolve the conflict to the satisfaction of the Project Representative.
 - 3. Abandoned dowel or anchor holes shall be completely filled with non-shrink grout and struck off flush with the adjacent surface.

3.08 CURING

- A. Cementitious Grouts:
 - 1. Clean equipment and tools as recommended by the grout manufacturer.
 - 2. Cure Grouts in accordance with manufacturer's specifications and recommendations. Keep grout moist for a minimum of 3 days. The method needed to protect grouts will depend on temperature, humidity, and wind. Wet burlap, a soaker hose, sun shading, ponding, and, in extreme conditions, a combination of methods shall be employed.
 - 3. Grouts shall be maintained above 40 degrees Fahrenheit until they have attained a compressive strength of 3,000 pounds per square inch, or above 70 degrees Fahrenheit for a minimum of 24 hours to avoid damage from subsequent freezing.
- B. Epoxy Grouts:
 - 1. Cure grouts in accordance with manufacturers' specifications and recommendations. Do not wet cure epoxy grouts.
 - 2. Consult the manufacturer for appropriate cure schedule. In no case should any surface in contact with epoxy grout be allowed to fall below 50 degrees Fahrenheit for a minimum of 48 hours after placement.

3.09 INSPECTION AND TESTING

- A. Installation of epoxy anchors shall take place under continuous supervision of the Special Inspector, who shall verify hole depth, diameter and cleaning; proper mixing and application of the epoxy materials; and installation of the fastener embedments to the proper depths.

- B. During the course of construction, the Project Representative may take separate field samples of the following materials for confirming tests:
1. Cement.
 2. Aggregates.
 3. Cement grout mixture.
 4. Commercially manufactured grout products.
- C. The testing laboratory will sample and test grout materials and submit results to the Project Representative.

END OF SECTION

This Page Intentionally Left Blank

Division 05
Metals



SECTION 05 12 20
STRUCTURAL STEEL

PART 1 – GENERAL

1.01 QUALITY ASSURANCE

- A. Materials, Fabrication, and Erection: Conform with the latest edition of AISC *Specification for Structural Steel Buildings and Code of Standard Practice for Steel Buildings and Bridges*.
- B. Welding: By operators qualified by tests as prescribed by the AWS in Standard Qualification Procedure for performance of the type of work required. Structural welding shall be performed by welders certified by WABO or local building department jurisdiction.

1.02 SUBMITTAL

- A. Shop Drawings: All fabricated metals illustrating dimensions, erection details, cuts, copes, connections, holes, threaded fasteners, and welds. Base dimensional data on actual field measurements where connections interface with other materials required.
- B. Mill Test Reports: Submit mill test reports for each shipment of materials or products.

1.03 PRODUCT HANDLING

- A. Delivery of Materials Installed Under Other Sections:
 - 1. Deliver anchor bolts, anchorage devices, sleeves, and other steel to be embedded in cast-in-place concrete or masonry prior to start of concrete or masonry work.
 - 2. Provide setting drawings, templates, and direction for installation of anchor bolts and other devices.
- B. Store above grade. Protect from corrosive elements.
- C. Handle and store during construction to prevent overstressing any elements.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Structural Steel – All new material, clean and free from damage:
 - 1. Rolled Shapes, Bars, and Plates: ASTM A992.
 - 2. Steel Pipe: ASTM A53 Grade B.

3. Tubes (HSS): ASTM A500 Grade B or C.
4. American Standard S shapes: ASTM A36.

B. Bolts:

1. Standard Bolts and Nuts: ASTM A307.
2. High Strength Bolts and Nuts: ASTM A325-N.
3. Anchor Bolts: ASTM A307.

C. Welding Electrodes: AWS E70XX.

2.02 FABRICATION

- A. Fabricate structural and architectural steel in accordance with the appropriate AISC Specifications with the modifications and additional requirements specified in this section.
- B. Weld all shop connections unless otherwise noted.
 1. Conform to AWS Code for "Arc Welding in Building Construction."
 2. Remove all weld spatter from exposed surfaces.
- C. Straightness of Structural Members: Straightness of structural members and fabricated assemblies shall conform to AISC Code of Standard Practice for Steel Buildings and Bridges.
- D. Shop Assembly:
 1. Fabricate units in as large parts and sections as practicable.
 2. Holes in members: Punch or drill as necessary to receive bolts and similar items. Do not cut holes with a torch.

PART 3 – EXECUTION

3.01 ERECTION

- A. Set and secure structural steel members and appurtenant connections accurately to the required lines and levels shown on drawings.
- B. All procedures and tolerances per AISC Code of Standard Practice for Steel Buildings and Bridges.
- C. Bolts, Anchors and Other Accessories: Install as necessary and as required for erection of structural steel.

D. Bearing Plates:

1. Provide under all steel, such as ends of beams bearing on concrete.
2. Shim with metal only.

E. Columns:

1. Set on leveling nuts or on metal shims to accurate elevations and grout solid.
2. Shim with metal only. Do not use wood wedges.

F. Anchor Bolts and Anchors: Locate and build into connecting work. Preset anchor bolts and anchors attached to templates of configuration required for fastening to structural members.

G. Grouting: After all structural members have been properly positioned and all bolts and anchor bolts tightened, place grout between concrete and steel. Finish exposed surfaces flush and smooth.

END OF SECTION

This Page Intentionally Left Blank

SECTION 05 50 00
METAL FABRICATIONS

PART 1 – GENERAL

1.01 QUALITY ASSURANCE

- A. Materials, Fabrication, and Erection: Conform to the latest edition of AISC “Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings” (steel assemblies) and the Aluminum Association’s Aluminum Construction Manual (aluminum assemblies).
- B. Welding: By operators qualified by tests as prescribed by the AWS in “Standard Qualification Procedure” for performance of the type of work required. Structural welding will require all welders to be certified by ICBO or local building department jurisdiction.
- C. Comply with OSHA and Building Code requirements.

1.02 SUBMITTALS

- A. Shop Drawings: All fabricated metals illustrating dimensions, erection details, cuts, copes, connections, holes, threaded fasteners, and welds. Base dimensional data on actual field measurements where connections interface with other materials required.
- B. Mill Test Reports: Submit mill test reports for each shipment of materials or products.

1.03 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle materials in such a manner as to prevent damage to finished surfaces.
- B. Store above grade in clean and dry locations. Protect from corrosive elements.

PART 2 – PRODUCTS

2.01 STRUCTURAL STEEL

- A. Conform to Section 05 12 20, “Structural Steel.”
- B. All structural steel shall be galvanized unless otherwise specified.
- C. Bolts: As specified in Section 05 12 20, “Structural Steel.”

2.02 STAINLESS STEEL

- A. Bars and Shapes: ASTM A276, Type 304.
- B. Plates: ASTM A240, Type 304.

C. Bolts: ASTM A193, Type 316.

D. Nuts: ASTM A194, Type 316.

PART 3 – EXECUTION

3.01 FABRICATION

A. Fabricate in accordance with the Drawings and additional requirements specified in this section.

B. Shop Assembly:

1. Fabricate units in as large parts and sections as practicable.

2. Holes in Members: Punch or drill as necessary to receive bolts and similar items. Do not cut holes with a torch. Provide adequate fastenings for wood nailers and similar items.

C. Galvanize all carbon steel bolts, fastenings, and hardware unless otherwise noted.

3.02 ERECTION

A. Set and secure accurately to the required lines and levels.

B. Protect the finish from scratches, nicks, and dents during erection.

C. Anchor Bolts and Anchors: Locate and build into connecting work. Preset anchor bolts and anchors attached to templates of configuration required for fastening to structural members.

D. Grouting: After all structural members have been properly positioned and all bolts and anchor bolts tightened, place grout between concrete and metal. Finish exposed surfaces flush and smooth.

END OF SECTION