

SECTION 133416 - GRANDSTANDS AND BLEACHERS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Permanent grandstand and associated ramps and stairs, as indicated on drawings and as required to integrate with existing conditions and existing bleacher construction and coordinate with the supporting structural steel supporting construction.
- B. General Contractor and Bleacher Contractor are reminded of the coordination requirements of this section. Regarding what is shown on the Contract Documents, the intent is to match the existing aesthetic of the stadium structure in the construction of the new structure.

1.02 RELATED REQUIREMENTS

- A. Section 033000 - Cast-In-Place Concrete: Concrete foundations, grout and anchor bolts.
- B. Section 055100 - Metal Stairs: Steel stairs and associated handrails and guards.

1.03 REFERENCES

- A. ASTM A 307 - Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength; 2004.
- B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel
- C. ASTM A 123 / A 123M - Standard Specification for Zinc (Hot-Dip) Coatings on Iron and Steel Products
- D. ASTM A 153 / A 153M - Standard Specification for Zinc Coating (Hot-Dip Galvanized) on Iron and Steel hardware
- E. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes and Tubes
- F. AWS D1.1 - Structural Welding Code - Steel
- G. AWS D1.2 - Structural Welding Code - Aluminum
- H. ASTM F-1679 - Standard Test Method for Using a Variable Incidence Tribometer
- I. ASTM E985, Standard Specification for Permanent Metal Railing Systems and Rails for Buildings

1.04 SCOPE OF WORK

- A. Provide engineering, material, freight, installation and supervision for a new permanent bleacher structure in accordance with the following specifications and conforming to applicable codes for all applicable loads and design requirements.
- B. Work to include all stairs, access ways and associated railings indicated on the Drawings for a complete bleacher system.

1.05 COORDINATION

- A. Coordinate installation of 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
- B. All existing bleacher geometry, framing layout, existing member sizes, existing member configurations and all other aspects of the existing bleachers that are necessary for designing and detailing the new bleacher system to integrate with the existing bleachers shall be field verified by the contractor. The methods and extent of field verification shall be up to the contractor. All field verification shall be

conducted prior to and incorporated into bleacher shop drawings prior to submitting shop drawings for approval.

- C. All bleacher construction and connections of bleacher construction shall be carefully coordinated with the supporting structural steel frame included in the contract documents. Coordination of bleacher and structural steel shop drawings shall be completed prior to submitting shop drawings for approval.
- D. The bleacher contractor shall provide all information pertinent to connection of bleacher structure to the structural steel support structure in a timely manner such that the information can be incorporated into the structural steel shop drawings prior to submitting for approval.
- E. The bleacher contractor shall provide all elements necessary to complete the bleacher construction. The bleacher scope shall start at the top side of the supporting structural steel and concrete slab construction designed in the contract documents. Any and all additional structure required for the performance of the bleacher system shall be included in the bleacher scope at no additional cost to the owner.

1.06 DEFINITIONS

- A. Structural Steel: Elements of structural-steel frame, as classified by AISC 303, "Code of Standard Practice for Steel Buildings and Bridges" and as modified herein.
- B. Seismic-Force-Resisting System: Elements of structural-steel frame designated as "SLRS" or along grid lines designated as "SLRS" on Drawings, including columns, beams, and braces and their connections.
- C. Heavy Sections: Rolled and built-up sections as follows:
 - 1. Shapes included in ASTM A 6/A 6M with flanges thicker than 1-1/2 inches.
 - 2. Welded built-up members with plates thicker than 2 inches.
 - 3. Plates thicker than 2 inches.
- D. Protected Zone: Structural members or portions of structural members indicated as by AISC 341 when using a structural system that requires AISC 341 detailing. Connections of structural and nonstructural elements to protected zones are limited.

1.07 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide a complete bleacher and stair system capable of withstanding all design loads required by the building code, industry standards, and as follows and within the limits and conditions indicated.
 - 1. ICC 300 unless modified herein
 - 2. Live Load: 100 pounds per square foot unless noted otherwise over gross horizontal projection but not less than that required by ICC 300.
 - 3. Live Load on Seat and Tread Plank: 120 pounds per linear foot
 - 4. Dead Load: Actual Material Weights
 - 5. Lateral Sway Stress: 24 pounds per linear foot of seat plank.
 - 6. Perpendicular Sway Stress: 10 pounds per linear foot of seat plank.
 - 7. Wind Load: Compute wind loads using structural design criteria and in accordance with ASCE 7-10
 - 8. Seismic Load: Compute seismic loads using structural design criteria given and in accordance with ASCE 7-10
 - 9. Snow Load: Per ASCE 7-10
 - 10. Railing Loads;
 - a. Vertical Live Load: 100 pounds per linear foot applied to top and intermediate rail.

- b. Uniform Horizontal Live Load: 50 pounds per linear foot applied to handrails and guardrails
 - c. Concentrated Horizontal Live Load: 200 pound concentrated load at handrails and guardrails, and a 50 pound concentrated load at intermediate rails.
11. Thermal Loads: Design framing systems to provide for movement of framing members without damage or overstressing, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change of 120 deg F.
12. Deflection: Maximum L/360 live load deflection for flooring members or members supporting floors

1.08 SUBMITTALS

- A. See Section 013300 - Submittal Procedures, for submittal procedures.
- B. Contractor's Statement of Responsibility Per Division 01 Section "Quality Requirements"
- C. Fabricator's Certificate of Compliance Per Division 01 Section "Quality Requirements" for Structural Steel Fabricator
- D. Quality Control/Assurance Plan: Structural Steel Fabricator shall submit the required quality assurance plan including the following:
 - 1. Fabricator's testing and inspection personnel or fabricator's
 - 2. Fabricator's testing agency and their associated testing and inspection personnel (if fabricator is employing a testing agency)
- E. Weekly Inspection reports for Shop Fabricated Structural Steel
- F. Nonconformance reports for Shop Fabricated Structural Steel
- G. Product Data:
 - 1. Manufacturer's data sheets on each product to be used, including:
 - a. Preparation instructions and recommendations.
 - b. Storage and handling requirements and recommendations.
 - c. Installation methods.
 - 2. Electrodes
 - a, Indicate what welding process will be used with each electrode
 - b, Submit electrodes for both shop and field welding
 - c. Indicate compliance with AWS D1.8 Clause 6.3 for electrodes used in both SLRS Connections and Demand Critical Welds
 - 3. Nonshrink Grout
 - 4. Post installed structural anchors: See specifications section 050520. (As used)
 - 5. Slide Bearings
- H. Shop Drawings: Complete layouts with dimensions for fabrication and erection, including plans, elevations and large scale details of typical sections and connections.
 - 1. Conduct a field survey of existing conditions as require to properly design and detail the new bleacher, stairs and ramps to integrate with the structural steel and concrete slab support structure and any other construction that is existing prior to this construction contract. All existing conditions shall be verified and incorporated into shop drawings prior to submitting for approval.
 - 2. Provide layout, dimensions and identification of each unit corresponding to sequence of installation and erection procedures.
 - 3. Provide location and details of anchorage devices to be embedded in or fastened to other construction. Furnish templates for accurate placement.
 - 4. All anchor rods shall be detailed with a minimum 2" projection above top of nut in the final installed condition unless noted otherwise.
 - 5. 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.

6. Where professional design submittals by Contractor are required the design submittal must be included with associated shop drawings or the submittal will not be reviewed.
 7. Identify members and connections of the seismic-load-resisting system.
 8. Indicate locations and dimensions of protected zones.(if protected zones are required)
 9. Identify demand critical welds.(if demand critical welds exists)
 10. Samples: Submit five samples for each finish product specified, two samples, minimum 18-inch seat sample, representing actual product, color and patterns
- I. Professional Design Submittal by Contractor
1. Submit comprehensive design analysis results for each truss, blocking panel, supplemental framing member and all other components designed under this specification. Analysis results shall be signed and sealed by the qualified professional engineer responsible for their preparation. As a minimum results shall include the following:
 - a. Design Criteria
 - b. Member Designs including member stresses and Live Load Deflections
 - c. Reactions on supporting structure per load case. Clearly tabulate reaction report and cross reference reaction locations to shop drawings.
- J. Welding Certificates
1. Submit welding certificates for all individuals expected to perform field welding. Ensure welders are certified for all types of field welds to be completed on the job.
- K. Welding Procedure Specifications (WPS's) and Procedure Qualification Records (PQRs): Provide according to AWS D1.1/D1.1M, "Structural Welding Code -Steel" and AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel," for each welded joint whether prequalified or qualified by testing, including the following:
1. Power source (constant current or constant voltage).
 2. Electrode manufacturer and trade name, for demand critical welds.
- L. Research/Evaluation Reports:
1. Submit evaluation reports for any proprietary products being used in structural applications where the strength has been validated by testing.
 2. Submit ICC reports for the following:
 - a. Mechanical Fasteners
 - b. Powder actuated fasteners (if used)
 - c. Post installed structural anchors: See specification section 050520
- M. Qualification Data:
1. Fabricator
 2. Erector
 3. Post Installed Structural Anchor Installer (if used)
 4. Powder Actuated Fastener Installer (if used)

1.09 QUALITY ASSURANCE

- A. A. Quality Control/Assurance Plan: Each fabricator shall provide a job specific Quality Control/Quality Assurance plan for shop fabricated steel.
1. The plan shall specifically identify all QC and QA inspections the fabricator will be completing, the frequency of those inspections and the fabricator's personnel and/or fabricator's testing agency that will be completing the specific inspections.
 2. AISC Code of Standard Practice
 3. The plan shall comply with AISC 360-10 chapter N modified as follows:
 - a. 100% UT of CJP groove welds without reduction.
 4. The plan shall comply with AWS D1.1

- B. Manufacturer Qualifications: Obtain required products from a single manufacturer with a minimum of 10 years' experience in the design and manufacture of permanent grandstands.
 - 1. Accessories: Provide accessory items only as produced or recommended by the manufacturer of the primary products.
 - 2. The entity responsible for structural steel fabrication shall be a qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, and which employs personnel or an independent testing agency that are qualified to complete all the required inspections and testing. Personnel shall be qualified as required by AWS D1.1 where completing weld testing and inspection.
- C. Installer Qualifications: Installer must be acceptable to or licensed by the manufacturer of products being installed, and shall be experienced in installing structural steel and all bleacher components equal in material, design and scope required for this project
- D. Powder Actuated Fastener Installer: All installers shall be experienced in installing anchors equal to type and into the substrate material required for the project. All installers shall have a manufacturer's training certificate.
- E. Post Installed Structural Anchor Installer: See specification section 050520 for requirements
- F. Engineering Responsibility: Preparation of Shop Drawings, design calculations, and other structural data by a qualified professional engineer.
- G. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated.
- H. Fabricator's Testing Agency (as required to supplement fabricator personnel): An independent agency, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated. Personnel shall be qualified as required by AWS D1.1 where completing weld testing and inspection.
- I. Welders: AWS certified
 - 1. Structural Steel welders: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 - a. Welders and welding operators performing work on bottom-flange, demand-critical welds shall pass the supplemental welder qualification testing, as required by AWS D1.8. FCAW-S and FCAW-G shall be considered separate processes for welding personnel qualification.
- J. Preinstallation Conference: Prior to installation of work of this section, conduct a meeting at the project site to discuss quality assurance requirements. In addition to the Contractor and the installer, arrange for the attendance of other installers affected by the work of this section and Manufacturer's representative.
 - 1. Review special inspection and testing and inspecting agency procedures for field quality control.
 - 2. Review welding requirements
 - 3. Review electrode storage requirements
 - 4. Review pre-construction bolt installation verification
 - 5. Review bolt installation calibration requirements
 - 6. Review requirements for protected zones (if they exist)

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation. Protect all components and accessories from corrosion, deformation, damage and deterioration when stored at job site. Keep materials free from dirt and foreign matter.
- B. Do not deliver seating to the project site until all other construction operations are completed
- C. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.

1.11 WARRANTY

- A. Provide manufacturer's one-year warranty against defects in materials or workmanship, including those attributable to abnormal aging, without reducing or otherwise limiting any other rights to correction which the Owner may have under the contract documents.
 - 1. The warranty shall include responsibility for removing and replacing other work as necessary to accomplish repairs or replacement of materials covered by the warranty.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Acceptable Manufacturers:
 - 1. Southern Bleacher Company, P.O. Box One, Graham, TX 76450, Tel (800) 433-0912, Web: southernbleachers.com.
 - 2. Dant Clayton Corporation, P.O. Box 740008, Louisville, KY 40201-7408, Tel (800) 626-2177, Web: www.dantclayton.com.
 - 3. Steel Stadiums, 4688 Highway 16 South, P.O. Box 2048, Graham, TX 76450 Tel: (940) 549-5700 Web: steelstadiums.com
 - 4. Sturdisteel, P.O. Box 2655, Waco, TX 76702-2655, Tel (800) 433-3116, Web: www.sturdisteel.com
 - 5. Substitutions: See Section 016000 - Product Requirements.

2.02 COMPONENTS

- A. Structural Steel
 - 1. All detailing, fabrication and erection shall be in accordance with AISC Specifications.
 - 2. Shapes:
 - a. W-Shapes and Tees: ASTM A 992
 - b. Channels, Angles Shapes: ASTM A 36 or ASTM A 572/A 572M, Grade 50
 - c. Plates: ASTM A 36 or ASTM A 572/A 572M, Grade 50
 - d. Heavy Sections: Comply with requirements of AISC 341 for heavy sections when designing a system that must comply with AISC 341
 - 3. Welding Electrodes:
 - a. Comply with AWS D1.1 requirements.
 - 4. Bolts:
 - a. ASTM A 325 or ASTM A 490 as required, Type 1, heavy hex steel structural bolts; ASTM A 563 heavy hex carbon-steel nuts; and ASTM F 436 hardened carbon-steel washers.
 - b. Hot-dip zinc coating, ASTM A 153/A 153M, Class C.
 - 5. Anchor rods:
 - a. ASTM F 1554, Grade 36 or ASTM F 1554, Grade 55, or ASTM F 1554, Grade 105 as required
 - b. Hot-dip zinc coating, ASTM A 153/A 153M, Class C.
 - 6. Columns: wide flange shapes.
 - 7. Support beams: wide flange or channel shapes.
 - 8. Stringers: wide flange or channel shape.
 - 9. Bolted Connections:
 - a. Snug tight unless required otherwise
 - 10. Welded Connections:
 - a. Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
 - b. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances in AISC 303 for mill material.

11. Finish: Structural steel shall be coated with a minimum of 2 oz. hot dipped galvanized in accordance with ASTM 123-A with a minimum galvanized film thickness of 3.3 mils. Zinc shall be 98% purity, certified with a written test results based on samples taken from the tank.
 - a. Fill vent and drain holes that will be exposed to the environment or that will be exposed in the finished work by plugging with zinc solder and filing off smooth.
12. Source quality control: All source quality control and source quality assurance shall be completed by the fabricator's qualified personnel and/or the fabricator's qualified testing agency and shall be in accordance with the submitted and approved job specific quality control manual
 - a. Payment for shop testing and inspection shall be the responsibility of the fabricator

B. Deck Systems:

1. Interlocking Deck System:
 - a. Rise per row and depth per row shall be as indicated on the Drawings.
 - b. Each seat 17 inches above its respective tread.
 - c. Decking Arrangement:
 - 1) The tread system shall be comprised of aluminum extrusions which interlock together lengthwise and form a .922' x .60" V-shaped gutter running the length of the planks. The interlocking mechanism will minimize deflection and not separate due to loads being applied to the individual planks. The locking mechanism shall allow for expansion and contraction of individual planks without effecting performance of the system.
 - 2) The system shall cause the deck planks to react together at all treads and cross walks to live load.
 - 3) The nose extrusion shall allow for a 1" extruded aluminum contrasting nose piece to be flush mounted on the leading edge and shall capture the vertical riser plank in an extruded pocket. The heel extrusion shall have a .70" vertical lip at the rear of the plank to allow for placement of vertical riser plank and prevent fluids from penetrating at the rear of the tread.
 - 4) Provide extrusions that allow the attachment of the seat brackets, step brackets, mid-aisle brackets and all other components to be accomplished with deck penetrations. No through bolting or drilling of the aluminum tread/riser system shall be permitted.
 - 5) At all butt locations of the interlocking deck system, a secondary gutter shall be installed below the aluminum tread riser system that allows fluids to be contained and gravity feed toward the first tread. The gutter will collect fluids and divert them into the existing storm water drainage system.
 - 6) The secondary gutter system shall be placed on to the structural steel support system of the grandstand to allow the gutter to be supported by stringers/raker beams at each side. These stringers/raker beams shall be a minimum of 12" apart to allow for adequate gutter widths to properly collect fluid drainage. Secondary gutters shall terminate at strategic locations dependent upon the grandstand layout. At the termination points, a collection box shall be installed allowing the system to be tied into the existing storm water drainage system.
 - 7) Dual joint sleeves shall be inserted at each butt joint of each load bearing aluminum plank, and shall penetrate a minimum of 6 inches into each plank at the joint. Joint sleeves are not required at gutter locations.
 - 8) Joints between new and existing construction will be covered with a 4" wide aluminum expansion joint cover. Manufacturer to verify existing tread and riser dimensions.

- D. Seat Planks: Extruded aluminum sections, of alloy 6063-T6, with ribbed top and Class II AA-M10C22A31 natural anodized finish with 1" radius comfort front edge and thickened at the joints.
 1. Size: 2 inches deep by 10 inches wide by 0.078 inches thickness.
 2. Provide end caps on each exposed end.
 3. Wherever sections are placed end to end, provide joint sleeve assembly of same material to maintain alignment.

4. Seatboards shall be attached to the system by riser mounted galvanized steel "L" brackets (deck mounted brackets not allowed). The seatboards shall align with the intermediate steps at the aisles. Seat brackets must have a positive connection to the steel frame of the bleacher. Attachment to the riserboard is not allowed.
- E. Step Planks: Extruded aluminum sections, of alloy 6063-T6, with ribbed top and mill finish.
 1. Size: Coordinate with tread dimensions indicated on the Drawings.
 2. Provide end caps on each exposed end.
- F. Riser Planks: Extruded aluminum sections, of alloy 6063-T6, with mill finish.
 1. Size: Coordinate with riser height indicated on the Drawings.
 2. Provide end caps on each exposed end.
- G. Plank End Caps: Formed aluminum, of alloy 6063-T6, with Class II AA-M10C22A31 natural anodized finish.
- H. Aluminum Railings: Anodized aluminum pipe railing with formed elbows at corners and caps at ends of straight runs, fastened to framing system.
 1. Pipe Size: As indicated on Drawings.
 2. Height at Front: As indicated on the Drawings.
 3. Height at Back and Sides: As indicated on the Drawings
- I. Stairs:
 1. Frames and stringers shall be A36 steel channel - finished to match grandstand structural steel.
 2. Treads shall be 6063-T6 extruded aluminum with a fluted surface and a minimum wall thickness of 0.078". Minimum vertical height of treads shall be 1 3/4" actual. Treads shall be mill finish.
 3. Risers shall be provided to fully close the stairs in all directions of travel.
 4. Intermediate steps in vertical aisle stairs shall divide the rise and run in half. Intermediate steps in vertical aisle stairs that create a vertical change in aisle access way are strictly prohibited. There will be no variance allowed for tread depth to exceed +3/16".
 5. Intermediate aisle stair tread shall be in line with seatboards in section view and plan view. Half steps that require step up to aisle are strictly prohibited.
 6. All aisle access shall be indicated on the Drawings.
- J. Miscellaneous Fasteners:
 1. Bolts and Nuts: ASTM A 307, steel, hot-dipped galvanized.
 2. Hold-Down Clips: Aluminum, alloy 6063-T6.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. Inspect substrates and conditions under which the work of this section will be performed, and verify that installation may commence. Do not proceed with the work until unsatisfactory conditions have been fully resolved.
- C. If substrate preparation is the responsibility of another installer, notify Heery International, Inc. of unsatisfactory preparation before proceeding.

3.02 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Set mounting inserts or provide setting templates and inserts to other trades involved in substrate construction.

3.03 INSTALLATION

- A. Prior to installation inspect in place supporting structural steel and concrete structure to ensure all elements in are in accordance with coordinated and approved shop drawings are built to within the project tolerances. Identify any items of concern that need to be addressed prior to construction of the bleacher system.
- B. Install in accordance with manufacturer's instructions and approved shop drawings.
- C. Base and Bearing Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.
 - 1. Bearing plates and loose column base plates shall be grouted and cured prior to erecting the steel to be supported by the plate
 - 2. Base plates attached to columns shall be grouted as soon as possible after the column has been plumbed.
 - 3. Prior to grouting all loose and latent material shall be removed from bearing surfaces and base or bearing plates. Concrete or masonry surfaces shall be broom clean. All shims or wedges shall be left in place and cut flush to the edge of the base or bearing plate.
 - 4. Grout shall be placed solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation and curing instructions for shrinkage-resistant grouts. Use grout forms and grout surcharging as required to ensure that grout completely fills the space below bearing or base plate, and no voids remain.
- D. Field Bolted Structural Steel Connections: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
- E. Field Welded Structural Steel Connections:
 - 1. Comply with AISC 303 and AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
 - 2. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances in AISC's "Code of Standard Practice for Steel Buildings and Bridges" for mill material.
 - 3. Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
 - 4. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances in AISC 303 for mill material.
- F. Structural Steel General
 - 1. Align and adjust various members that form 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.
 - 2. Do not use thermal cutting during erection unless approved by Architect. Finish thermally cut sections within smoothness limits in AWS D1.1/D1.1M.
 - 3. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts. For slip critical connections enlarge hole to next standard hole size and provide next standard bolt size.
 - 4. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360
- G. Post Installed Structural Anchors: See specification section 050520

3.04 REPAIRS

- A. Clean areas where galvanizing is damaged or missing and repair galvanizing to comply with ASTM A 780.

3.05 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products at Substantial Completion.

3.06 CLEANING

- A. Clean all surfaces after erection, in accordance with manufacturer's recommendations.
- B. Remove and properly dispose of all packaging and construction debris.

3.07 FIELD QUALITY CONTROL

- A. Structural Steel
 - 1. The erector shall complete Field Quality control in accordance with AISC 360 Chapter N
- B. Special Inspections: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports in accordance with the schedule of special inspections.
- C. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.
- D. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements when the work was deemed deficient upon initial testing or inspection.

END OF SECTION 133416