1. Steel Structures [556] (added 6-05-25)

Rescind Section 556 Steel Structures and replace with the following:

Description. This work is the furnishing, fabricating, painting, and erecting of steel structures and the steel structure portions of composite structures.

The Department uses 490 pounds per cubic foot to calculate the weight of structural steel.

The weights of rolled shapes and plates up to and including 36 inches in width are computed based on their nominal weights and dimensions as shown on the shop drawings. One-half of the allowed percentage of overrun in weight as tabulated in ASTM A6 will be added to the nominal weights of plates exceeding 36 inches in width. The weight is computed on the basis of rectangular dimensions for all plates and overall lengths for all structural shapes with no deductions for copes, slips, sheared edges, punching, borings, milling, or planing. When parts can be economically cut in multiples from materials of larger dimension, the calculated weight is that of the material from which the parts are cut.

Bolts, nuts, and washer weights are the calculated weight in the AISC Manual of Steel Construction.

Weld metal weight is not computed.

MATERIALS

Furnish materials in accordance with the following subsection requirements:

Bearing Assembly Anchor Bolts for Bridges 711.13

Bolts and Nuts 711.07

Castings 711.12

Compression Joint Seals 711.15

Elastomeric Bearing Devices 711.14

Fiber-reinforced Pads for Bearing Plates 711.16

Galvanized Metal 711.08

High Strength Bolts 711.06

Pins and Rollers 711.04

Structural Steel 711.02

Structural Steel Tubing 711.03

Welding Electrodes 711.05

Welded Stud Shear Connectors 711.09

CONSTRUCTION REQUIREMENTS

For the fabrication of steel structures, follow AASHTO LRFD Bridge Construction Specifications, and the AASHTO LRFD Steel Bridge Fabrication Specifications. unless otherwise specified in the contract.

556.03.1 Pre-Qualification for Steel Fabricators

Use metal fabricators that are pre-qualified under the AISC Quality Certification Program for the items listed below. The Department will make an exemption for new manufacturing plants that are of the same ownership as an existing certified plant, provided the new manufacturing plant operates under the same quality assurance and control programs as the certified plants, modified to address any production differences, and all fabrication is performed under the direct supervision of a quality assurance and control manager provided by an existing pre-qualified plant. Direct supervision means that the quality assurance and control manager is on site during all fabrication performed in the new fabrication plant and is responsible for the quality assurance and control activities. For new manufacturing plants, submit and receive approval of any proposed modifications to the parent plant’s quality assurance and control program prior to beginning production. Allow 30 business days from the date submitted for Department review and approval. New manufacturing plants may operate under the parent plant’s quality assurance and control programs for a maximum of 18 months from the date of opening. Items not listed may be fabricated by non-certified shops. Use metal fabricators having the following AISC quality certification categories:

Use fabricators having Advanced Bridges (ABR) certification to fabricate the following:

Fracture critical members and attachments. Fabricators must have the Fracture Critical Endorsement (F).

Tub, trapezoidal or closed box girders, large or non-preassembled trusses [over 200 feet] cable supported bridges, bascule bridges, arches, and bridges with tight radius.

Use fabricators having Intermediate Bridges (IBR) certification to fabricate the following:

Fracture critical members and attachments. Fabricators must have the Fracture Critical Endorsement (F).

Rolled beams with field or shop splices, either straight or with a radius over 500 feet.

Built-up I-shaped plate girders with constant depth, either straight or with a radius over 500 feet.

Built-up I-shaped plate girders with variable web depth (e.g., haunched), either straight or with a radius over 1000 feet.

A truss with a length of 200 feet or less that is entirely or substantially pre-assembled at a certified facility and shipped in no more than three sub-assemblies.

Welded floor beams.

Diaphragms for horizontally curved girders.

Use fabricators having Simple Bridges (SBR) certification to fabricate the following:

Non-spliced rolled beams.

Non-spliced rolled floor beams.

Non-spliced rolled diaphragms for straight girders (does not include diaphragms used for concrete beams).

Use fabricators having an SBR or Bridge and Highway Metal Component Manufacturers certification to fabricate the following:

Bridge expansion joints.

Steel grid decking.

Bridge expansion bearings.

Overhead sign bridge and cantilever sign structures.

Lighting poles and anchor bases.

556.03.2 Submittals

* 1. Fabrication Drawings. Prior to fabricating members, submit fabrication drawings and include the following information. The Department will have 20 calendar days to review.

An erection layout with each member assigned a production number.

A tentative fabrication schedule.

Denote any changes from the details in the contract.

All dimensions, geometrical information, details, and other data required for fabrication. Include camber information, blocking diagrams and shop splices.

Denote specification, grade, finish, required toughness testing and required surface preparation for all steel plates, shapes, pipes, tubes, bars, and all miscellaneous hardware such as shear studs, bolts, stud bolts, threaded rods, nuts, and washers.

Identify the applicable specification for galvanized items. Specify paint type, manufacturer and recommended dried film thickness for each coat applied in the shop for painted items. Also identify surface preparation for each item to be painted. For paint requirements see Sections 612 and 710.

A list of field bolts and other items furnished by the fabricator:

Appropriate weld sizes, symbols, requirements for non-destructive testing, heat cambering and bending procedures. Provide welding certifications and welding procedure specifications and any supporting documentation for all welding required for fabrication. For welding requirements see Section 624; and

Welding Procedure Specification (WPS) identification is required in the weld symbol tail for all weld symbols shown on the shop drawings.

Submit shop drawings of welding procedures and design calculations. Ensure the submittal includes all information required to check the structural accuracy and fabrication procedures for the structure.

Structural shop drawings must be designed and stamped by a professional engineer registered and licensed to conduct engineering in the State of Montana.

Do not begin fabrication until the Department approved drawings are received by both the plant and the Project Manager. Coordinate the fabrication schedule with the Project Manager.

Certificate of Compliance. Furnish a manufacturer’s Certificate of Compliance for all bolts, nuts, washers, and load indicator washers. Include documentation in accordance with Subsection 106.09 and test reports performed on the finished bolt confirming that all of the materials provided meet the requirements of the applicable AASHTO or ASTM specification. The documentation must include the name and address of the test laboratory, the date of testing, lot identification and the sample sizes of bolts and nuts used for each test performed for the certification.

Submit the following items before installation: The Department will have 20 calendar days to review.

The certification from the supplier showing that all tests required by the AASHTO and ASTM specifications have been performed. Include the date and location of those tests, as well as the production lot numbers, and the sample sizes used for each test performed with the certification.

The certification from the supplier showing that the wedge tests and rotational capacity tests have been performed. Also show production lot numbers, dates, locations, and sample sizes of these tests and who performed them.

Three bolt, nut, and washer assemblies from each rotational capacity test lot for verification by the Department.

Do not install fasteners prior to receiving approval.

556.03.3 Mill and Shop Inspection

* + 1. Inspection of Work. Do not begin manufacturing or shop fabrication until the Department’s Inspector has inspected the shop.
		2. Facilities for Inspection. Furnish facilities for inspecting the material and workmanship in the mill and shop. Always allow the Inspector free access to the work.
		3. Inspector’s Authority. The Inspector may reject material or work not in accordance with the specifications. In case of dispute, the Contractor may appeal the Inspector’s decision to the Project Manager.
		4. Mill Test Reports. Provide the Project Manager signed documentation in accordance with Subsection 106.09. Certify all steel meets the project specifications. Identify each piece of steel with a mark number on the mill test report.
		5. Facilities for Testing. Furnish, at Contractor expense, test specimens, labor, testing machines, and tools to make the specimens and tests.
		6. Rejections. Material or finished members accepted by the Inspector may be rejected if the material is subsequently found defective. Replace or repair rejected material at Contractor expense.

556.03.4 Storage and Handling of Materials

* + 1. Mark alloy and high-strength steels as required by the AASHTO LRFD Bridge Construction Specifications. Mark material required to meet a Charpy requirement for identification.
		2. Store materials off the ground and keep them clean and dry.
		3. Place and store girders upright.
		4. Support long members, including but not limited to columns, chords, and girders on blocks spaced to prevent deflection.
		5. Store high-strength fastener components in accordance with the manufacturer’s recommendations.
		6. Store the bolts and nuts in the original containers until used.
		7. Protect from dirt and moisture.
		8. Remove only as many fasteners from protected storage as can be tightened during a work shift and return unused fasteners to protected storage at the end of each work shift.

556.03.5 Quality Control

Prepare and submit a quality control (QC) plan for ensuring the quality of all work and conformance to specifications. The Department will have 20 calendar days to review.

Ensure that all nondestructive testing (NDT) is performed by personnel qualified in conformance with the American Society for Nondestructive Testing (ASNT) Recommended Practice No. SNT-TC-1A to minimum Testing Level II for the individual methods. Ensure that the QC plan meets the following minimum requirements:

* + 1. Include descriptions of any necessary pre-work meetings, procedures to verify materials meet approved submittals, and QC testing plan.
		2. NDT, Radiographic Inspection. Inspect 100% of all complete joint penetration (CJP) groove welds.
		3. NDT, Ultrasonic Inspection. Inspect 100% of all CJP groove welds on plates thicker than ¼-inch.
		4. NDT, Magnetic Particle Inspection. Randomly inspect 25% of all welding for each member throughout the entire structure in accordance with AWS D1.5 bridge welding code. The Project Manager reserves the right to select locations for testing.
		5. Personnel qualifications. Include the qualifications of the specific individuals that will be performing the QC testing.
		6. Quality control manager. Identify the QC manager that will be the primary contact person for all QC communication. Ensure that this person is responsible for all QC work.
		7. NDT, Phased Array Ultrasonic Testing (PAUT). This method may be used in place of RT and UT for the inspection of CJP groove welds. Perform all aspects of PAUT inspection in accordance with AWS D1.5, Annex K. Provide, for approval, a submittal package 30 days prior to inspection. Provide all information, qualifications, etc. needed to determine the requirements of Annex K can be met. Include the inspector’s history of successful NDT projects specific to PAUT and the requirements of AWS D1.5.

Complete reports of all QC testing as the testing is performed. Identify in the reports any deviations from specifications, standards, or the QC plan and a discussion of why the deviation occurred. Submit any reports containing any deviations, defects, or non-compliance to the Project Manager within 24 hours. Make other reports available upon request. Submit repair plans for approval. The Department will have 3 working days to review.

At the completion of fabrication, and before shipment, provide all QC reports and a certification signed by the quality control manager that contains the following statement and supporting information:

Required Statement: “This is to certify that the quality control plan was followed and that the results of the quality control program indicate that the materials and the construction operations controlled by the quality control plan are in conformity with the approved plans and specifications. Exceptions to the plans, specifications, and quality control plan are described below.”

556.03.6 Pilot and Driving Nuts for Pins.

Furnish 2 pilot nuts and 2 driving nuts for each size of pin unless otherwise specified. Pilot and driving nuts are not required when shoes are assembled at the fabrication plant.

556.03.7 Bolts and Bolted Connections

* 1. General.

When galvanized fasteners are specified, furnish assemblies manufactured with a visible dye, so a visual check verifies the presence of lubricant at installation.

When uncoated fasteners are specified, use black fasteners oily to the touch at installation.

Use beveled washers to provide full bearing to the head or nut where bolts are used on beveled surfaces.

* 1. Definitions. Terms are defined in the Steel Structures Technology Center, Inc. Structural Bolting Handbook, 2022 ed. (Bolting Handbook).

Unfinished Bolts. Furnish standard unfinished bolts. Furnish bolts that extend through the nuts a maximum ¼-inch.

Breakaway Connections. Install breakaway connections in accordance with the breakaway device manufacturer’s recommendations.

Temporary Bolts. When used, temporary bolts are required to be of the same diameter as the production bolt and clearly marked or coated to distinguish them from permanent bolts. They are exempt from testing and storage requirements and may be re-used as temporary bolts.

556.03.8 Bolted Connections - High-Tensile-Strength Bolts

* 1. Submittals. Prior to installing bolts, submit the following for review and approval. The Department will have 20 calendar days to review.

Erection Plan. Submit an erection plan meeting 556.03.14.

Installation Method. Submit the method(s) that will be used:

Turn of the nut,

Calibrated wrench,

Direct Tension Indicator (DTI),

Tension Control Bolts (twist-off),

Combined Method (Torque Nut Angle)

General. Make bolted connections in accordance with the most current version of Steel Structures Technology Center’s Structural Bolting Handbook (Bolting Handbook), which is a compilation of the Research Council on Structural Connections (RCSC 2020 ed.), AISC (2022 ed.), and AASHTO (4th ed. 2017 with interim) code requirements.

In the event of a conflict between this Special Provision, a code, and the Bolting Handbook, the hierarchy is as follows: 1. This Special Provision, 2. code, 3. Bolting Handbook. All provisions termed as “recommendations” in the Bolting Handbook are contract requirements.

Jobsite Storage. Store bolting components as required in the Bolting Handbook.

Production Lot Traceability. Protect bolt container labels from damage. Maintain lot traceability of each component during storage and handling, so that any component’s lot number will be identifiable until the point of installation.

Component Assembly Condition.

Do not install components that are rusty, dirty, or otherwise damaged/compromised.

Tension Control (Twist-Off) Assemblies. Reject tension control components that are rusty or dirty, or otherwise compromised, or have them cleaned and relubricated by the original manufacturer.

Other Components. Reject other components that are rusty or dirty or clean/relubricate according to the Bolting Handbook. Suppliers written recommendations for type and application of lubrication are required and must be applied to all remaining components of the lot(s) in question.

Bolt Lengths. Use bolt lengths having the grip-length values in Table 556-1 plus the total thickness of connected material. The values in Table 556-1 consider nut, one flat washer, and bolt point.

Increase the bolt length ⅛-inch if direct tension indicator washers are used.

Adjust the length to the next ¼-inch increment up to a 5-inch bolt and to the next ½-inch increment for bolts over 5 inches.

Table 556-1

Bolt Length Determination

|  |  |
| --- | --- |
| **Bolt Diameter** | **Added Grip Length1** |
| **English** |
| ½-inch | ⅞-inch |
| ⅝-inch | 1-inch |
| ¾-inch | 1⅛-inch |
| ⅞-inch | 1⅜-inch |
| 1-inch | 1½-inch |
| 1⅛-inch | 1⅝-inch |
| 1¼-inch | 1¾-inch |
| **Metric** |
| M16 | 25 mm |
| M20 | 30 mm |
| M22 | 35 mm |
| M24 | 40 mm |

Note: 1. Add to total thickness of connected material.

Where beveled washers are used, adjust bolt lengths to account for the use of nonstandard or beveled washers.

Bolted Parts. Ensure bolted surfaces in contact with the bolt head and nut do not have a slope of more than 1V:20H to a plane normal to the bolt axis.

Provide a Class B finish, in accordance with AASHTO LRFD Bridge Construction Specifications for all faying surfaces. Restore the Class B finish for faying surfaces that have degraded prior to joint assembly.

Washers. Install hardened washer(s) under the turned component and in accordance with the Bolting Handbook.

* 1. Pre-Erection Meeting. Schedule a pre-erection meeting to be at least seven calendar days before beginning steel erection and prior to installation of permanent high strength bolts, to review the bolting requirements and the approved erection sequence. The Project Manager, Steel Fabrication Specialist (or their designee), and the bolting crew supervisor(s) are required to attend the meeting. Repeat annually for multi-year projects.

Pre-Installation Verification (PIV) Testing.

Perform Pre-installation verification procedures in accordance with the Bolting Handbook. Retest when directed by the Project Manager. Use a Skidmore Wilhelm Bolt Tension Measuring Device (BTMD) or equal that has been calibrated by the manufacturer or testing laboratory within the last 12 months. Keep calibration documentation with the BTMD. Notify the Project Manager at least seven calendar days prior to PIV testing. The Steel Fabrication Specialist or their designee must be present during PIV testing.

For all installation methods, use the same tools for PIV testing that will be used during the installation.

The Steel Fabrication Specialist or their designee will issue a written certification for passing lots. Do not install components without certification.

* + 1. Reuse of previously pretensioned components. Do not reuse previously pretensioned components.
	1. Production Bolting. Do not install components from any lot until the lot has passing PIV and Department Lab testing. Repeat sampling and testing (PIV and Lab) for subsequent construction seasons.

Condition. Verify that the condition of the assembly is equivalent to that of the Pre-installation Verification test. Conditions of the assembly and the efficiency of the lubricant can be affected by many factors, including:

Exposure to the elements.

High temperatures during storage.

High temperatures during tightening.

Low temperatures during tightening.

Additional moisture from snow and rain during pretensioning.

Contaminants such as dirt, dust, rust.

Loss of lubrication.

If these conditions occur, or if untensioned bolts have been exposed to weather for more than two days, or if bolts have been cleaned and relubricated, repeat the pre-installation verification test on at least 3 assemblies of each length. If any of the test fails, replace or relubricate all components within the affected connection(s).

Re-lubrication. If bolts require relubrication, submit for approval the supplier’s written recommendations for type and application of lubrication. Re-lubrication of tension control bolts may only be performed by the manufacturer.

Snugging. Snug tighten structural connections in accordance with the snugging procedures and systematic approach given in the Bolting Handbook. Repeat the snugging cycle over the connection as necessary until all plies are brought into firm contact. A minimum of 2 snugging cycles is required. If firm contact is not achievable, notify the Project Manager.

Pretensioning. Fully tighten bolts in accordance with the pre-tensioning procedures given in the Bolting Handbook.

Turn of the Nut Method. Match mark as described in the Bolting Handbook.

Failures. Report fastener assembly stripping, breaking, or other failures to the Project Manager immediately and stop bolting until the cause of failure has been determined and documented, and the Project Manager approves continuation of pretensioning. Provide broken fastener(s) to the Project Manager.

Connection Acceptance. In the presence of the Inspector, verify each structural connection within 72 hours of completing installation and pretensioning of bolts as described below.

Access. Provide arms-length access to the connection for the Inspector so that they can observe installation or perform verification.

Bolt selection and marking. The Inspector will select and circle ten percent (two minimum) of every bolt length within the connection for verification testing.

Pretension Verification.

Connections with Direct Tension Indicating (DTI) Washers (including Self Indicating DTI washers).

For verification of a completed joint, use a metal feeler gauge to inspect DTI washers on the selected fasteners. Connection fastener tension is acceptable if the selected fasteners meet the feeler gage refusal/acceptance requirements listed in the Bolting Handbook and manufacturer recommendations/instructions. For passing results, the Inspector will mark the connection, indicating acceptance.

If any fastener checked does not meet the requirements, inspect each bolt in the connection with the feeler gage and continue/complete pretensioning each as necessary. Resubmit the connection for inspection.

Other Connections. Furnish and use a torque wrench that indicates torque by means of a readout or that may be adjusted to give an indication that a defined torque has been reached, to verify tension as follows.

Calibration. Calibrate the torque wrench at least once each inspection day using five fastener assemblies of the same grade, size, and condition as those under inspection. Use a washer under the part turned in tightening each bolt if washers are used on the connection. Use the same material that abuts the part turned in the tension measuring device as used on the connection if washers are not used on the connection. In the calibration device, tighten each bolt to the exact value listed in the Required Minimum Bolt Pretension table in the Bolting Handbook. Apply the torque wrench to the tightened bolt to determine the torque required to turn the nut or head five degrees (approximately one inch at a 12-inch radius), in the tightening direction. Discard the high and low torque values. The inspection torque is the average of the torque values for the other three bolts. Discard any bolts used for calibration.

Verification. Verify the bolts represented by the test bolts by applying, in the tightening direction, the inspection torque to the bolts selected by the Inspector.

Connection fastener tension is acceptable if no nut or bolt head is turned. The Inspector will mark acceptable connection(s) with an indelible marker.

If any nut or bolt head is turned with the inspecting torque, apply the inspection torque to all fasteners in the connection. Once the inspection torque has been applied to all fasteners, the connection is acceptable and the Inspector will mark the connection, indicating acceptance.

556.03.9 Welded Stud Shear Connectors

The type, size or diameter, and length of stud shear connectors are specified in the contract.

Furnish fabrication material and perform welding in accordance with Section 624.

* 1. Shop Drawing Review. Provide alternate stud locations that will avoid conflict with safety and lifting devices. Ensure that all shear studs are a minimum of 6 inches away from top flange shop splices. Obtain approval from the Bridge Bureau before installing any studs in these alternate locations.
	2. Field Removal. Stud shear connectors that are removed in the field must use one of the following removal methods:

Cut completely through the stud above the weld.

Partially cut the stud above the weld and break off the stud the rest of the way. Prevent damaging the base metal during stud removal.

* 1. Field Replacement. Replace all stud shear connectors that are removed in the field. Replacement shear studs must be within 3 inches of the original stud location, no closer than 1½ inches from base metal edges, and at least 1 inch between adjacent studs. Follow all the surface preparation, field welding, and testing requirements in accordance with AWS D1.5.
	2. Additional Payment. No additional payment will be made for field removal and replacement of stud shear connectors and base metal inspection, repair, or replacement.

556.03.10 Field Welding

Notify the Project Manager and Steel Fabrication Specialist at least 3 working days prior to field welding. Do not weld temporary construction supports to beams, girders, or other main members. Any member with unauthorized field welds, tack welds, or arc strikes will be rejected. Perform welding in accordance with Section 624.

556.03.11 Assembling Steel

Field or shop assemble steel parts as follows:

* 1. Shop Work. Clean all contacting metal surfaces of deleterious materials before assembling, bolting, or welding. Paint may be applied to contact surfaces after bolting or welding.

Shop assemble and adjust to line and camber all bolted trusses, continuous plate girders, curved steel elements, box girders, I-beam spans, skew portals, skew connections, rigid frames, bents, and towers.

Drill and ream the field splice holes during assembly. Holes for other field connections may be shop drilled or reamed with the connecting parts assembled or drilled or reamed to metal templates with hardened bushings, without assembling.

Use an approved alternate procedure where shop space prevents complete shop assembly of continuous span girders or trusses. The procedure may require adjusting the line and camber of at least two abutting sections of girder for drilling or reaming of field splices if all girder lines for the complete structure are assembled consecutively.

Field butt joints for welded girders may be assembled with abutting members adjusted for line and camber and prepared to fit for welding, subject to Project Manager approval.

Bridge expansion devices must be initially shop assembled to establish the proper fit between the joint parts.

* 1. Field Work. Assemble the parts as specified in the contract, following the match-marks. Prevent damaging the material while handling. Clean all bearing and member surfaces in permanent contact before assembly.

Splices and field connections must have a minimum of ½ of the holes filled with bolts or erection pins before removing temporary supports or releasing the load from erecting equipment.

Do not place deck forms or other loads on straight steel girders except in accordance with an approved erection plan.

Use erection pins 1⁄32-inch larger than the nominal diameter of the permanent bolts.

* 1. Drifting of Holes. Use a minimum of two drift pins during assembly to the extent necessary to bring the parts into position without enlarging or distorting the holes or metal. Do not ream holes during field fitting without approval from the Project Manager.
	2. Match-marking. Match-mark parts assembled in the shop for reaming field connection holes and provide the Project Manager a diagram showing the marks.

556.03.12 Marking and Shipping

Paint or mark each member with an erection mark and furnish the Project Manager an erection diagram detailing the erection marks.

Furnish copies of material orders, shipping statements, and erection diagrams. Show the individual member weights on the statements.

A shipping statement must accompany the material and be marked to clearly identify it with the delivered material and the relevant domestic material and contract specification certifications.

Mark the weight on members weighing 3 tons or more. Load and unload structural members on trucks or cars without stressing or causing damage.

Pack bolts, loose nuts, or washers of each size separately. Ship pins, small parts, bolts, washers, and nuts in boxes, crates, kegs, or barrels, with the gross weight of each package not exceeding 300 pounds. Plainly mark each shipping container, listing and describing the contents on the outside of each shipping container.

Keep structural material clean and free from damage.

556.03.13 Painting

Clean and paint all iron and steel surfaces in accordance with Section 612.

556.03.14 Erection

Submit a steel erection plan and specifications meeting the latest editions of the AASHTO LRFD Bridge Construction Specifications and the AASHTO Steel Bridge Erection Guide Specification, that ensures safety, prevents overstressing of the steel, maintains stability, prevents damage to the work or surroundings, and achieves the proper final geometry. Submit a complete erection plan and specifications for erection of the steel and for any necessary falsework, temporary bracing, temporary bolts, or other items. Describe the sequencing of bolt snugging and pretensioning.

The erection plan and specifications must bear the signature and seal of a professional engineer licensed to practice in Montana. Check and approve before submitting. The Department has 20 calendar days to review and return the submittal.

556.03.15 Falsework

Design, construct, and maintain falsework to support the maximum construction loadings. Check and approve falsework drawings before submitting. The Department has 20 calendar days to review and return the submittal.

556.03.16 Bearing and Anchorage

Place masonry bearing plates in accordance with Subsection 565.03.2.

556.03.17 Placing Anchor Bolts

Place anchor bolts in accordance with Subsection 552.03.13.

556.03.18 Straightening Bent Material

Submit a plan to the Project Manager for approval, for straightening bent material. The Department has 20 calendar days to review and return the submittal.

556.03.19 Pin Connections

Furnish the Project Manager the pilot and driving nuts provided with the steelwork once the work is complete. The members must take full bearing on the pins. Bring pin nuts up tight and burr the threads at the nut face.

556.03.20 Misfits

Correct all misfits, errors, and injuries as a part of the assembly and erection work. Report to the Project Manager all shop work errors that prevent the assembly and fitting of parts with a minimum use of drift pins, reaming, slight chipping or cutting. Obtain Department approval for the correction method. Corrections must be inspected and approved.

556.03.21 Cleanup

Remove all falsework, excavated or unused materials, rubbish, and temporary buildings. Restore all public and private property damaged during construction to its original condition.

Pull, cut off or otherwise remove all falsework piling 1-foot below finished the ground line or streambed, unless otherwise directed. Perform all work affecting the stream channel in accordance with Subsection 208.03.4 before final acceptance.

556.03.22 Rejections

An Inspector’s acceptance of material or finished members does not prevent later rejection if defects are found. Replace or repair rejected material and work at Contractor expense.

556.03.23 Girder Profile Survey. Survey the top flange 10th points under steel dead load after completion of erection and before adding any additional dead load. Submit to the Project Manager a minimum of 14 calendar days prior to deck placement.

556.04 Measurement and Payment. Structural Steel is measured and paid for by the lump sum.

The weight of structural steel in the contract is an estimate only. No guarantee is made that the estimated weight is the correct weight to be furnished. No adjustment in the contract unit price is made if the weight furnished is more or less than the estimated weight.

If changes in the work ordered by the Project Manager vary the weight of steel to be furnished, the lump sum payment is adjusted as follows:

The value per pound of a decrease or increase in the weight of structural steel involved is determined by the following:

Value per Pound = Contract Lump Sum Bid/Estimated Contract Weight

The adjusted contract lump sum amount paid is the contract lump sum bid plus or minus the value of steel involved in the change.

Should the ordered change materially alter the character of the work and the unit cost, compensation for that work is made at an agreed price established before the work is performed. Detail in writing, the changes in procedures and the resulting costs for labor, equipment, and materials to support the agreed price.

Partial payments for structural steel will be made based on the lump sum contract unit price as follows:

90% when erected.

97% when bolted and spot painted.

100% when fully in compliance with the plans and specifications.