

## 500 STRUCTURES

### ITEM 501 - STRUCTURES GENERAL

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**501.01 Description.** General Build structures as shown on the plans according to the specifications for the various items that constitute the completed structure.

Perform work, including fabrication, erection, and construction, so that the entire structure and all its component parts will function as designed.

**501.02 Verification of Dimensions.** Verify that all dimensions established by the Engineer are correct.

**501.03 Notification of Fabricator.** *If furnishing materials under Items 513, 515, 516, 517, and 518 select a fabricator from the Ohio Department of Transportation's pre-qualified fabricator's list in effect the date of the Contract letting. Before or at the pre-construction conference, provide a written notification to the City of the selected steel fabricators and the selected precast concrete fabricators.*

**501.04 Shop Drawings.** *Provide shop drawings detailing structural steel, metal structural elements, prestressed concrete members, precast concrete structural elements, and other similar materials requiring either shop or field fabrication according to AASHTO "Standard Specifications for Highway Bridges".*

1. **Contractor Acceptance of Shop Drawings for Items 513 and 515.** After preparing the shop drawings for Items 513 and 515 submit them to the City seven days before the pre-fabrication meeting, or prior to the start of fabrication on Item 513 UF level. City approval of these shop drawings is not required.

Include in the shop drawing submission a written acceptance letter and six copies of each drawing, unless additional copies are requested. Also furnish the fabricator's quality control specialist with one additional set of these drawings before the pre-fabrication meeting.

*Prepare the shop drawings by or under the direct supervisory control of an Ohio registered engineer having professional knowledge of AASHTO “Standard Specifications for Highway Bridges” and Items 513 and 515. The professional engineer shall seal and date each drawing. Have all questions and comments addressed before submitting the shop drawings.*

*The Contractor’s written acceptance letter shall document acceptance of the shop drawings including confirmation of field verification, as required and descriptions of issues resolved between the Contractor, the fabricator, or the City.*

*By accepting these shop drawings, the Contractor represents to the City that all dimensions and elevations of existing conditions given in the plans have been field measured and verified, and that these shop drawings comply with all the materials requirements, construction requirements, contract requirements, and performance criteria. The Contractor further represents that these drawings have been coordinated and verified with the details of the work to be performed by other fabricators and entities on the project. The City will not make any allowance for additional cost or delays to the Contractor for incorrect fabrication as a result of failure to coordinate or perform this acceptance.*

*When the City requests changes on these shop drawings, or the Contractor makes changes in addition to those expressly requested, ensure that the shop drawings are accepted as above with suitable revision marks to identify the changes.*

*Schedule the pre-fabrication meeting after the submission of the drawings. Fabrication may begin after the pre-fabrication meeting is complete or after receipt of Item 513 UF level drawings.*

- 2. *Fabricator Coordination of Shop Drawings for Items 516, 517, and 518.***  
*The Contractor and fabricator must coordinate these shop drawings. Ensure that shop drawings meet requirements for materials, field measurements, construction requirements, contract requirements, performance criteria, and similar data. The coordination must also include details of the work to be performed by other fabricators and entities on the project. The City will not make allowance for additional cost or delays to the Contractor for incorrect fabrication as a result of failure to coordinate or perform this coordination.*

*Submit six copies of the shop drawings to the City with the delivery of materials to the project. City approval of these shop drawings is not required.*

- A. *Shop Drawing General Requirements. Specific requirements are specified in Items 513, 515, 516, 517, or 518.*

*Drawings can be submitted in any of the following formats: 22 x 34 inch, (559 mm x 864 mm) 8 ½ x 11 inch ( 212 mm x 275 mm), 8 ½ x 14 inch (212 mm x 350 mm), 11 x 17 inch (275 mm x 450 mm). The text should not be smaller than 10 points on any copy submitted to the City. After fabrication is complete, the Contractor shall furnish the City with shop drawings on a 35-mm microfilm copy of each drawing mounted on an aperture card. The Contractor may also opt to supply the information on CD.*

**501.05 Approval of Construction Plans.** *The City and all involved railway companies will approve the following plans before work can begin. Submit plans described in paragraphs (a), (c), (f), and (g) to be approved by the railroads before submitting to the City. Submit plans described in paragraphs (a) through (g) to the City at least 20 days before construction begins.*

*When pre-cast concrete sections such as endwalls or wingwalls are proposed as a substitute for cast-in-place concrete, shop drawings shall be accompanied by complete engineering calculations indicating that the proposed pre-cast design is equal to the concrete section specified on the plans. Pre-cast concrete shop drawings shall be signed and sealed by an engineer licensed to practice in Ohio.*

Obtain approval before beginning construction. To obtain approval, submit three copies of the plans plus an additional four copies for each involved railway company Prepare the plans using an Ohio registered professional engineer. The Professional engineer shall seal and date the plans. Submit two copies of the design computations with the plans.

- (a) Plans for sheeting and bracing of excavation adjacent to railroad tracks.
- (b) Plans for falsework for cast-in-place concrete bridges over 20 feet (6.1m) in span.
- (c) Plans for the proposed erection and handling procedure for (1) plate girder bridges, (2) rolled beam bridges except single span bridges with spans less than 80 feet (24 m), (3) trusses, (4) arches (5) structures carrying railway traffic. Include on the drawings the complete framing plan showing each girder or beam section by "piece mark," sequence of erection, load capacity of erection equipment to be used, method of lifting members, splicing procedures, and methods for obtaining stability. *Use erection equipment for unloading and any interim handling.*

- (d) Plans for welding permanent or temporary attachments to main structural members except those shown or permitted by contract plans
- (e) Plans for proposed erection of prestressed concrete box beams where erection involves placement of cranes or launching devices on previously erected spans.
- (f) Plans and procedures for proposed demolition of structures over railroad properties. Include the sequence of work and methods of protecting railroad properties on drawings.
- (g) *Plans for erection and handling procedure for prestressed concrete I-beam.*

Acceptance of the above construction plans does not relieve the Contractor of responsibility for the behavior of the procedures proposed.

**501.06 Test Reports.**

1. *Contractor acceptance of Materials for Item 513. Submit certified test data to the City showing compliance with the requirements of Item 711. Accompany all certified test data with copies of mill shipping notices showing the quantity and size of material being accepted.*

*Check this material data and provide a letter of written acceptance. Submit the material data and letter of written acceptance to the City so that the City receives them at least seven days before final shop inspection Item 513 levels 1 through 6 or before final shop inspection Item 513 UF level.*

*Submit a single copy of this material data for each structure, except where the structure carries railway traffic. Submit one additional copy to each railway company involved.*

*Additionally for levels 1 through 6 structural steel members, submit one copy of main material, certified test data with a letter documenting the QCFS acceptance to the QA shop inspector before the material passes check point one.*

*The City will not accept materials for final inspection at the fabrication shop until the City receives the Contractor accepted material data.*

2. *Fabricator Certification of Materials for Items 516, 517, and 518. Ensure that a letter of certification accompanies the fabricated material shipped to the job site in a format approved by the City, stating all materials conform to contract requirements. For these materials the fabricator must*

*retain certified test data, copies of mill shipping notices, or invoices showing the quantity and size of material being accepted. This data shall provide complete traceability to the producing mill and proof of domestic origin, as required by ORC 153.011.*

*Do not deliver materials to the project without the certification letter.*

**501.07 Construction Stresses.** *If equipment having a gross weight in excess of 60,000 pounds (27,000 kg) is placed on or driven across a structure, submit the structural analysis showing the stresses produced by the equipment and associated loads to the City for review and approval.*

*Do not allow equipment having a gross weight in excess of the posted limit to be place on or driven across a structure.*

*Do not allow erection and construction methods, or use or move erection equipment on or across the uncompleted or completed structure to subject any part of the structure to unit stresses that exceed by more than one-third the allowable unit stresses, as given in AASHTO "Standard Specifications for Highway Bridges."*