

**FY 2013/2014 QC Category No. 10B  
STATEWIDE INSPECTION GUIDELIST  
Bridge Structures - Bearings / Beams / Bolts**

**BEARINGS**

1. Beam seat / pedestal concerns: proper elevation, concrete bearing surface planeness and levelness, surface free of irregularities, proper placement of bearings relative to survey marks and seats/pedestals within elevation tolerances for beam superstructures. [Spec. 400-11 & Good Practice]
2. Anchor bolt and bearing plate concerns: location, tolerances and installation of anchor bolts and bearing plates, bolt material per spec., expansion plate adjustments for temperature, proper setting method, bolt holes not through rebars. [Spec. 460-7]
3. Elastomeric pads shall meet material specs. including tolerances and have deformations that do not exceed 50% of pad thickness. Pot/disc bearings shall be manufacturer certified and conform to specs. and be protected from the elements prior to placement, manufacturer's representative with a knowledge and experience certification on site during installation, installation in conformance with manufacturer's recommendations and the shop drawings. [Spec. 932-2 & 461-5]

**BEAMS**

4. Concerns for all beams: damage or flaws such as kinks, warps, bends, cracks, plates out of plumbness or squareness; pickup points in proper location; Producer on list of Producers with accepted quality control programs; Producer acceptance stamp, certification and beam identification; proper storage; correct beam lengths prior to shipment; erect beams at fixed bearings first; and do not place the weight of the superstructure or of beams on a cap until the cap concrete is at least ten days old. [Spec. 400-17, 460, 450 & Good Practice]
5. Store concrete beams in an upright position on proper dunnage, support at the proper locations under the beam and report excess camber or sweep. Prestressed beams and slabs must be inspected for defects upon delivery to the project site and defects must be reported to the Project Administrator immediately. [Spec. 450-16]
6. Concrete beams shall be handled carefully and lifted only at pickup points identified in the Contract Documents. [Spec. 450-16]
7. Concrete and steel beams should be erected according to the framing plan and the centerline of beam bearing point must coincide with the centerline of the bearing area, longitudinally and transversely. For construction affecting public safety, beam stability calculations must be submitted for Engineer review as well as an erection plan by a Specialty Engineer who must inspect the initially erected structure in the field. Daily Contactor inspections of erected members are required until diaphragms and cross frames or decks are in place. For all steel, the Contractor's erection plan must be reviewed by the Engineer prior to the start of erection. [Spec. 5-1, 460-7, Good Practice]
8. Store steel beams according to item 4 above, and surfaces should be kept free of dirt, oil or any other foreign matter. Shear studs must be installed in the field only and results of shear stud bend tests must be recorded. [Spec. 460-4, 502-5, CPAM 10.9]

9. Field assembly of steel beam component parts shall be done by the use of methods and devices unlikely to produce damage by twisting, bending or otherwise deforming the metal and if weathering steel, meet special requirements. For all beams, assembly and disassembly of falsework that temporarily supports any permanent structural component must be in compliance with the Contractor's erection plan and approved shop drawings. Immediately report violations of the erection plan or falsework systems that seem to be inadequate, to the Project Administrator. [Spec. 460-7 & Good Practice]
10. During steel beam erection, before bolting, beams shall be adjusted to correct grade and alignment and field connections shall be securely drift-pinned before bolting - at least 50% of bolts should be in place at major connections prior to release. Verify that web plumbness is per spec. once full dead load is applied. Conduct a substructure survey prior to erection and report discrepancies to the Project Administrator for resolution. Correction of significant beam misalignments must be approved by the Engineer before implementation. [Spec. 460-7, Good Practice]

## **BOLTS**

11. Fastener assemblies shall comply with all materials specs. including all required certifications, bolt material test reports, rotational-capacity test reports done by the manufacturer or distributor and be sampled and tested properly. [Spec. 460-4 & 5]
12. A bolt LOT tracking and enforcement system shall be maintained during every operation until complete. [Spec. 460-4]
13. Approved bolt lubricants shall be used and proper procedures shall be used for lubricating the required fastener components. [Spec. 460-4 & 5]
14. Fastener assembly components shall be packaged, handled and stored properly [Spec. 460-4]
15. A bolt rotational-capacity (RC) test [Florida Method FM5-581 (for long bolts) or FM5-582 (for short bolts)] shall be performed at the project site on a minimum of two units of each combination of high strength fastener assemblies prior to their installation. [Spec. 460-5]
16. For general bolt installation, each fastener assembly shall be tightened to at least the tension shown in the spec. and there are strict procedures for performing tightening. [Spec. 460-5]
17. Detailed testing procedures must be followed to establish the correct snug tight torque. [Spec. 460-5]
18. Before bolting begins, connection plate surfaces must be in the proper condition and, unless otherwise shown in the contract plans, the bolt holes must meet the bolt hole geometry specified in the specification. The plate and hole alignment methods must be done properly. [Spec. 460-4]
19. For snugging bolts in the connection, if an impact wrench is used, the wrench must be

set at or above the daily snug tight torque - the inspector should witness the snugging of each bolt. The order in which bolts should be tightened is critical as are the spec. requirements for snugging: refer to FDOT Structures Inspection Training Manual, Part Two, for a detailed example of exactly how this is done. [Spec. 460-5 and Good Practice]

20. For final tightening of the connection, the Turn-Of-Nut or DTI (twist-off bolts are not permitted) method requires very detailed procedures. An inspector must witness the turning of every nut and a washer must be under the element that is turned. Bolts shall not be tensioned to more than 115% of the required minimum bolt tension. [Spec. 460-5 & Good Practice]
21. Detailed procedures must be followed for mating and final tightening of bolts for highway sign, traffic signal and lighting structures. [Spec. 700-2]
22. Detailed procedures must be followed for setting, mating and final tightening of nuts on anchor bolts for beam bearings, steel poles, steel mast arms, monotube assemblies and highway sign structures. [Spec. 460-7, 649-5 & 700-2]

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23. Except for steel with a cost of less than 0.1% of total contract amount or \$2,500.00, whichever is greater, steel and iron must be produced in the U.S. for all projects. [Spec. 6-5]