FY 2016/2017 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 dimensional tolerances. 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, 400-11 & 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, keep records of monthly camber measurements 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. For beams outside of the sweep tolerance, immediate measures need to be implemented to bring them within tolerance. [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. At a minimum for structures without temporary supports but with temporary girder bracing systems, weekly Contractor inspections of erected members are required until diaphragms and cross frames or decks are in place. For structures with temporary supports, perform daily inspections until the temporary supports are no longer needed as indicated in the erection plans. 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 the holes should be filled at primary members as well as connections of diaphragms or crossframes prior to release. The 50% may be either snug tight erection bolts or full size erection pins, but at least half of these holes, or 25% of all holes, shall be bolts. The 50% requirement may be waived if a reduced percentage is calculated and shown on an approved erection plan. 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 material tracing and enforcement system shall be maintained during every operation until complete. [Spec. 460-3 & 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 sealed, transported and stored properly in watertight containers. [Spec. 460-4]

15. A bolt rotational-capacity (RC) test [Florida Method FM 5-581 (for long bolts) or FM 5-582 (for short bolts)] shall be performed at the project site on a minimum of two assemblies per LOT designation of permanent high strength fastener assemblies prior to their installation. Components of the assembly shall come from the same LOT and container. [Spec. 460-5]

16. For general bolt installation, each fastener assembly shall be tightened to at least the tension shown in the Spec. For DTI's, meet device tightening criteria. [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]

BUY AMERICA

23. The total value of all foreign steel or iron products permanently incorporated into the work must not exceed 0.1% of total contract amount or $2,500.00, whichever is greater. This applied to all projects. [Spec. 6-5]