C1 General Design

C1.11.5 Quality assurance

Quality Control/Quality Assurance Record

Project Description:

Project Number:

Design Number:

File Number:

Design Team                                      Name                  PE Number    Signature

Transportation Engineer Manager (TEM)

Designer:

Technician:

Checker:

Engineer of Record (EOR):

Hydraulic Design Engineer:

Design Parameters (Complexity)

Alignment:  Straight ____  Curved _____

Superstructure:  CCS (std) ____  CCS (dsn) ____  PPCB (std) ____  PPCB (dsn) ____  
                 RSS (std) ____  RSS (dsn) ____  CWPG _____
                 RCB (std) ____  RCB (dsn) ____  MISC (std) _____  MISC (dsn) ____

Substructure:  Integral Abutment _____  Stub Abutment _____
                 Pile Bent Pier _____  Frame Pier ____  T-Pier ____  Wall Pier _____

C1.18 Local Systems Review

LPA CURSORY REVIEW ITEMS FOR BRIDGE OR CULVERT PLANS

The following bulleted items are some of the general issues/concerns to address for cursory structural reviews. Since each structure is different, not all of these items pertain to each cursory review. Furthermore, the extent of the review shall not be limited to the items below. The review engineer shall make a sound judgment on what the critical issues are for the structure.

January 2019
Verify the design code and specifications are correct.
Verify that the plan has typical bridge or culvert design makeup: bridge, geotechnical, and road sheets. Notify the engineer of record if any items might be missing.
Verify that all disciplines have a PE seal in the plans.
Briefly verify that the type of structure is appropriate for the location based on the Situation Plan sheet. For bridges and culverts, the structure should meet the general policies established in the BDM. [BDM 7.1.1(culverts) and BDM 3.6, 3.7, 5.1.1, 6.1.1, 6.5.1.1, 6.6.1.1 (bridges)]
For bridges, verify horizontal and vertical clearances are acceptable or piers are adequately protected. [BDM 3.2.2.4 (waterway), BDM 3.3.1, 3.7.4 (highway), and BDM 3.4.1.1 to 3.4.1.4 and 3.4.2.1 to 3.2.4.2.4 (Railroad)]
For bridges over waterways, briefly review the hydraulic information for conformance to the OBS preliminary design policies. Some example items to review are given below:
1. Pier type is adequately chosen for the drainage area listed or for the potential of debris flowing in the channel. [BDM 3.7.4]
2. Stream velocities and scour depths may indicate a need for stream bank protection. [BDM 3.2.2.6]
3. “Design” and “Check” scour elevations and high water elevation for stage flows should be listed.
For bridges over railroads, briefly review the proper safety and protection accommodations are in the plan set. (BNSF and UP railroads have additional requirements).
2. Piers within 25’ of centerline track shall meet heavy construction as defined in AREMA. [BDM 3.4.1.3, 3.4.2.3, 6.6.2.6]
3. Bridge berms preferably have macadam stone slope protection.
4. Proper 44” TL-5 barrier rails or fencing is used based on type of traffic on bridge (vehicular, bicycle, or pedestrian) [BDM 3.4.1.6, 3.4.2.6, 5.8.1.2]
If standard bridge or culvert sheets appear applicable, encourage the designer to use them:
1. Bridge wing armoring
2. Subdrains
3. Slope Protection
4. Abutment backfill procedures
5. Etc.
For bridges, briefly review the soil borings to obtain an idea of the foundation bearing conditions. For pile foundations, generally assess the Structural Resistance Level (SRL-1, SRL-2, etc.) of the pile foundation and the adequacy for the soil conditions.
Look for future maintenance headaches (i.e. type of bearings or lack of bridge deck drainage).
Look for structural adequacy problems. Member sizes should visually be reasonable and all necessary structural components should be included (i.e. intermediate diaphragms).
Look for constructability problems (i.e. steel reinforcing congestion in concrete).
Encourage serviceability improvements to the structure (i.e. deck drains).