Final Bridge – Plan and Model Deliverables

The intent of this document is to define the Bureau's current expectations for delivering projects using Bentley CONNECT software. The following list primarily applies to the Bureau's common structure types such as PPCB, CWPG, Rolled Steel (RS), CCS, and single and multi-cell RCB culverts. The last section on repairs applies to all structure types.

New and Replacement Bridges (PPCB, CWPG, RS, and CCS)

1. Delivery of Traditional Plans
   a. Contract plans shall be delivered as a 2D PDF.
   b. Plan sheets shall be developed using the Bentley CONNECT Edition of MicroStation, OpenRoads Designer (ORD), OpenBridge Modeler (OBM), and/or ProStructures.
   c. Incorporating current V8i standards in the plans is acceptable. Converting the V8i standards to CONNECT is not required and consultant contracts shall not designate additional hours for making the conversion. CONNECT versions are currently being developed. For guidance, refer to the "V8i Standards in CONNECT Files" document on the Bureau website.
   d. Cutting details from the model is not required but is encouraged; especially when it is beneficial for creating complex details. Adding isometric details to the plan is also encouraged when needed to improve understanding of the design.
   e. Consultant contracts shall not designate additional (extra) hours for cutting details from the model.

2. Development of the Bridge Model
   a. Consultant contracts may designate hours for developing the OBM bridge model.
   b. OBM shall be used to develop the 3D bridge model. The Bureau's current modeling expectations are as follows:
      i. Superstructure models shall include the deck, railings, beams, primary and intermediate diaphragms, and bearings. Superstructure models may exclude approach slabs, expansion joints, construction joints, deck drains and deck drain surface depressions, concrete chamfers, barrier rail conduit, and lighting.
      ii. In addition to the previous item, CWPG and RS superstructure models shall include shear connectors, bearing stiffeners, transverse stiffeners, longitudinal stiffeners, and flange deflectors. Models may exclude bolt holes, bolt assemblies, and welds.
      iii. Substructure model shall include the piles, drilled shafts, abutments, piers, and retaining walls.
      iv. Modeling the proposed bridge berm terrain in ORD is completed and delivered during preliminary bridge design and therefore, is not considered a final bridge deliverable.
   c. Rebar 3D modeling is not required. Using ProStructures for rebar modeling will be required at a later date and is currently only being encouraged.
   d. Consultant contracts shall not designate hours for ProStructures 3D rebar modeling unless specifically requested.
   e. For staged projects, the complete structure shall be modeled, with linework and dimensions separating the individual stages.
   f. All files used in the development of the bridge model and the development of the contract letting plans shall reside in the project folder within ProjectWise.

g. Currently the OBM model will not be provided to the contractor at letting as a contract or non-contract deliverable. At a future date the Department's digital delivery plan will likely include the OBM model as a deliverable to the contractor at letting.

3. OBM Bridge Model Output
   a. The following reports should be developed from the OBM bridge model when applicable:
      i. Bridge staking coordinate data
      ii. Top of slab elevation data
      iii. Beam haunch data
      iv. Pile/drilled shaft coordinate data
      v. Beam seat elevations
      vi. Abutment wing elevations
      vii. Bottom of abutment footing elevations
      viii. Bottom of pier cap elevations
      ix. Top and bottom of pier footing elevations
   b. Consultant contracts may designate hours for producing the above reports.
   c. Currently these reports will not be provided to the contractor at letting as contract or non-contract deliverables. At a future date, the Department's digital delivery plan may include these types of reports as deliverables to the contractor at letting.
   d. These reports are not intended to replace the E-File submittals required at plan turn-in.
   e. The automated reports do not function with custom abutments and are not required at this time.

New and Replacement RCB Culverts (CIP and Precast)

1. Delivery of Traditional Plans
   a. Contract plans shall be delivered as a 2D PDF.
   b. Plan sheets shall be developed using the Bentley CONNECT Edition of MicroStation, ORD, OBM and/or ProStructures.
   c. Incorporating current V8i standards in the plans is acceptable. Converting the V8i standards to CONNECT is not required and consultant contracts shall not designate additional hours for making the conversion. CONNECT versions are currently being developed. For guidance, refer to the "V8i Standards in CONNECT Files" document on the Bureau website.
   d. When needed for a precast RCB alternate, the longitudinal section shall be cut from the model. Cutting other details from the model is not required but is encouraged when beneficial to creating complex details.
   e. Consultant contracts shall not designate additional hours for cutting details from the model.

2. Development of a Culvert Model
   a. Consultant contracts may designate hours for producing and delivering the ORD model.
   b. Use ORD Drainage and Utility tools to develop the 3D culvert model.
   c. If a precast alternate is needed, a separate model is to be developed.
   d. Rebar modeling is not required.
   e. For staged projects, the complete structure shall be modeled, with linework and dimensions separating the individual stages.
   f. All files used in the development of the culvert model and the development of the contract letting plans shall reside in the project folder within ProjectWise

g. Currently the ORD model will not be provided to the contractor at letting as a contract or non-contract deliverable. At a future date the Department's digital delivery plan may include the ORD model as a deliverable to the contractor at letting.

3. ORD Culvert Model Output
   a. An excavation quantity report shall be developed from the ORD culvert model.
   b. Consultant contracts may designate hours for producing the above report.
   c. This report will not be provided to the contractor at letting as a contract or non-contract deliverable. At a future date, the Department's digital delivery plan may include these types of reports as deliverables to the contractor at letting.
   d. Any reports developed from the model are not intended to replace the E-file submittals required at plan turn-in.

Bridge and RCB Culvert Repairs (All types)

1. Delivery of Traditional Plans
   a. Contract plans shall be delivered as a 2D PDF.
   b. Plan sheets shall be developed using the Bentley CONNECT Edition of MicroStation, ORD, OBM and/or ProStructures.
   c. Incorporating current V8i standards in the plans is acceptable. Converting the V8i standards to CONNECT is not required and consultant contracts shall not designate additional hours for making the conversion. CONNECT versions are currently being developed. For guidance, refer to the "V8i Standards in CONNECT Files" document on the Bureau website.

2. Development of a Bridge and Culvert Repair Model
   a. An OBM model is not required for bridge and RCB culvert repair projects.