

## 8.14 PROVIDING SUPPLEMENTAL DATA TO CONTRACTORS

On 3D designed projects, CDOT provides supplemental 3D data to Contractors for information only at Project Advertisement. Referencing Transportation Research Board (TRB) Report SPR 1680 prepared for the Michigan Department of Transportation, CDOT has determined that the overall benefit of the statewide policy of providing 3D data at Project Advertisement for information only and not part of the Contract outweigh the risks to the Department. The central benefit of this practice as documented in SPR 1680 is the reduction of bid prices stemming from all bidders being supplied with better bidding information.

When Contractors are not supplied with available 3D data, they often allocate significant resources towards recreating a 3D project model based off cross sections either before Award for bidding or after to facilitate construction. After using designer data to more efficiently create their own 3D model, Contractors gain efficiencies during construction through reduced staking by loading the data directly to an automated machine or into a machine operator.

CDOT has deep experience with 3D modeling and determining which projects are good candidates for 3D modeling. As a result, the Resident Engineer or Project Manager will continue to determine which projects are good candidates for 3D design. Electronic information beyond the Contract package is not expected to be provided to Contractors on projects that are not deemed as good candidates for 3D modeling by CDOT staff.

To provide additional information about the 3D data being provided when it is available and make clear that the supplemental 3D data is not part of the Contract, CDOT staff is to include project special provision worksheet 102ppod or Revision of Section 102 - Project Plans and Other Data.

For file distribution, it is recommended that Project Staff place the supplemental files in a central location like Google Drive in lieu of attempting to distribute flash or hard drives to all bidders. To streamline file distribution, project staff may create a PDF for posting to B2G with the drive link or download instructions if staff decide to use an FTP site rather than Google Drive.

### 8.14.1 DESIGN CONSIDERATIONS

#### 1. 3D Modeling Quality Assurance:

The Quality Assurance (QA) of 3D models is critical just as QA is with all other elements of design. CDOT is developing the suggested QA procedure specific to OpenRoads Designer (ORD) projects. Once complete, this procedure will be posted at:

<https://www.codot.gov/business/designsupport/cadd>

#### 2. Data Density for 3D Engineered Models

Template Drop Intervals:

- a. Everywhere along the alignment (Except complex design areas) - 10-foot intervals,
- b. Complex design areas (Intersections, etc.) – one-foot intervals,
- c. Additional template drops should occur at:
  - i. Event Points defined in the horizontal alignment.
  - ii. External Control Points - (Point Control, location where multiple corridors interact, locations where the proposed alignment tie with the existing alignment, Parametric Constraints, template transition, superelevation transition stations, and End Condition Exception).

#### 3. Electronic Deliverables:

- a. Project Alignments
  - i. LandXML file generated of all Proposed Geometry, including proposed Horizontal & Vertical geometry.
- b. Surfaces – LandXML files of the following:
  - i. Existing Terrain Model – Triangles Only
  - ii. Finished Grade Terrain Model – Both Triangles and Features
  - iii. Subgrade Terrain Models – Both Triangles and Features

- c. DGN files:
  - i. 3D Components of the Project Design Model
  - ii. ROW
  - iii. Topo
  - iv. Additional files include – Discipline Design Files
  - v. Other Files – As needed per project
- 4. File Naming Convention:
  - LandXML Files
    - a. Alignments – JPC#\_Alignments.xml
    - b. Surfaces:
      - i. JPC#\_Existing Ground.xml
      - ii. JPC#\_Finished Grade.xml
      - iii. JPC#\_Subgrade\_Alignment Name.xml

CADD Drawing Files

- c. DGN files:
  - i. 3D Components - JPC#RDWY\_3DModel\_Components.dgn
  - ii. Topo – JPC#SURV\_Topo.dgn
  - iii. ROW – JPC#ROW\_Design.dgn
- d. Additional files include – Discipline Design Files:
  - i. Roadway:
    - Roadway Design - JPC#RDWY\_Design.dgn
    - Alignments – JPC#RDWY\_Alignments\_GEO.dgn
    - Stationing – JPC#RDWY\_Stationing.dgn
    - Cross Sections – JPC#RDWY\_Design\_XSEC.dgn
  - ii. Drainage – JPC#HYDR\_Design.dgn
  - iii. Bridge – JPC#BRDG\_Design.dgn
  - iv. Utilities – JPC#UTIL\_Design.dgn
  - v. Striping – JPC#TRAF\_Striping.dgn
  - vi. Other Files – As needed per project