



# OpenRoads Survey: Bridge Surveys

## Bridge Field Codes

The ODOT Feature Code list includes the field codes listed below for bridges. The information in this section is provided to better define the codes and their intended use.

Field Code	Description	Terrain Model Attribute
BD	Bridge deck	Do Not Include
BOB	Bottom of the beams	Do Not Include
BRFLOOR	Bottom of the bridge deck	Do Not Include
BRRAIL	Top of the bridge railing or parapet	Do Not Include
BRSEAT	Beam seat elevation shots	Do Not Include
PIER	Perimeter of the pier	Do Not Include
PIERCB	The bottom of the pier cap	Do Not Include
PIERT	The outline of the pier cap	Do Not Include
WALLA	The outline of the abutment wingwall or the face of the abutment breastwall. Shoot the bottom of the wall as a break line.	Break

**BD:** Bridge Deck is used to determine toe to toe of parapet and perimeter of the bridge deck.

**BOB:** Bottom of beam is used to determine vertical clearance and location of the beams. Use judgment to determine the points of critical vertical clearance. The minimum shots for BOB are one at each bearing. If the beams might be reused, shoot the web for one exterior beam. Also shoot any changes in the bottom of the beam due to cover plates. Shoot a point on each side of the change in section. Measure the center to center spacing of the beams. This will be used to determine the location of the beams.

**BRFLOOR:** Bridge Floor is used to determine out to out of bridge deck and bottom of bridge deck. This is especially important for slab bridges and stage construction. If stage construction is considered, a shot should be taken where the deck will be cut for stage construction. Discuss with the project manager if this shot is necessary and exactly where the shot should be taken.

**BRRAIL:** Bridge Rail is used to locate the barrier. This information may be needed if the parapet is to be reused. Discuss with the project manager where the shots on the railing should be taken.

**BRSEAT:** will be used for the elevation of the beam seat. Take shots as close to the centerline of each beam as possible. Record where the point was taken in relation to the beam. These shots will be used in conjunction with the BOB to determine the height of the bearing device.

**PIER:** used to determine location, and size of pier columns.

**PIERCB:** used to determine location, skew, and size of pier cap.

**PIERT:** Pier Top is used to determine location, skew, and size of pier cap. These shots are used to determine the skew of the pier cap. Take a shot at the top and bottom of each step in the pier cap. Also,



take a shot on the opposite side of the pier cap. These shots will be used to determine the width of the pier cap.

**WALLA:** The purpose of these points is to determine the location and skew of the abutment. From these shots we would also like to be able to get the outline of the wall. For the wing walls, at a minimum get a point at all four corners and another shot along each face of the wing wall. Shoot the bottom of the wall or where the ground meets the wall as a break line. If you are collecting the bridge information as a separate job on the data collector, the WALLA feature code should be included with in the topographic data, not in the bridge data.

## Terrain Model Requirements

For projects containing one or more bridges, the existing ground terrain models should not include any of the bridge information. A separate terrain model is required for the surface of each bridge.

Note that the bridge codes in the ODOT Field Code list are all configured with the terrain model attribute set to Do Not Include except for the WALLA code. This will ensure that the ground terrain model for the project contains the existing ground information under the bridge and does not include the bridge itself.

## Data Collection Procedures

The recommended practice for bridge surveys is to collect all the bridge information as a separate job in the data collector. This ensures that all the necessary data for the bridge is isolated from the ground terrain survey and can be used to easily generate a terrain model for the bridge deck information. Note that the WALLA feature should be collected with the topographic information, not as part of the bridge job in the data collector.

If the bridge information has been collected in the same job on the data collector as the topographic survey, the easiest way to generate the surface of the bridge is to use the Bentley Civil Terrain Modeling tools to create the bridge deck surface from 3D graphics rather than the OpenRoads Survey tools.

An example processing the bridge data contained in a separate CSV file is included below.



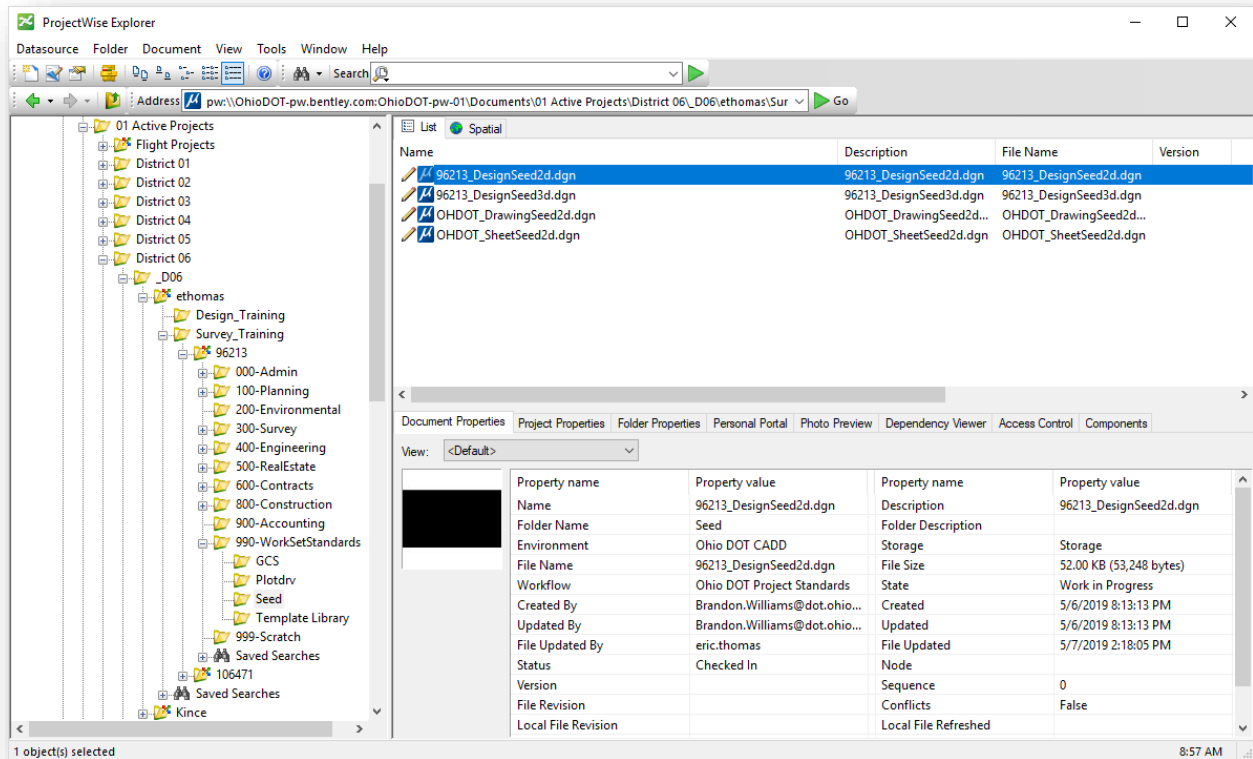
## Exercise: Bridge Surveys

In this exercise we'll process survey data in which the bridge information was collected as a separate job on the data collector. Each portion of the data will be processed into separate field books.

- Open **ProjectWise Explorer**



- Open the 96213\_DesignSeed2d.dgn file using your home District and your user name (use D06 for Central Office employees).



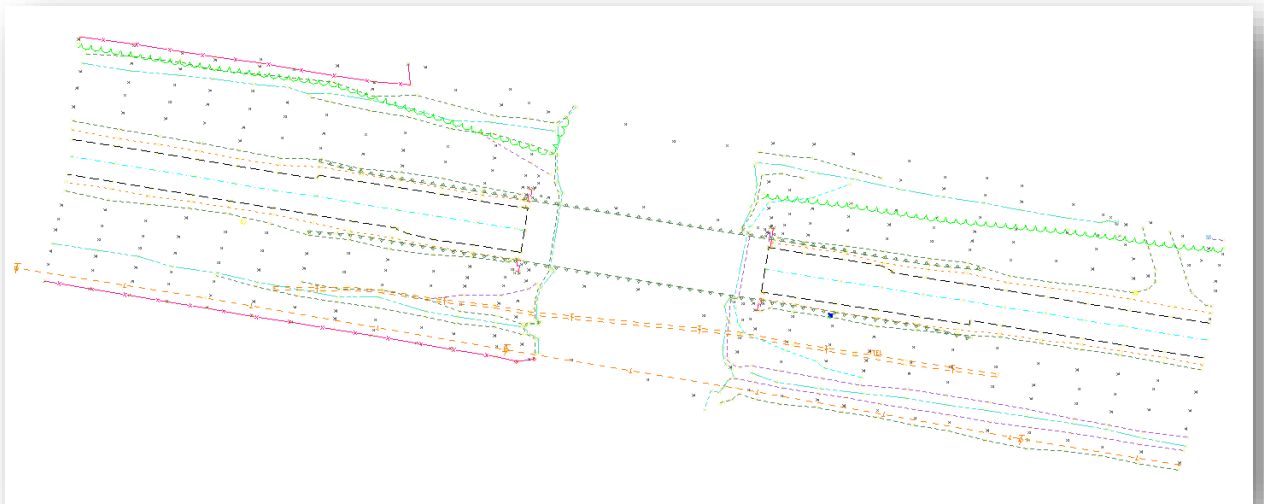
- Select the **Ohio DOT** WorkFlow from the top left of the ORD interface.
- From the **Apps** tab, select the **OHDOT Create Design Files** icon
- Create another Field Book (FB) design file for this exercise
- Open the newly created Field Book (FB) design file
- Create a new **Field Book** to import the topo data. Rename the Field Book to “Topo Survey”



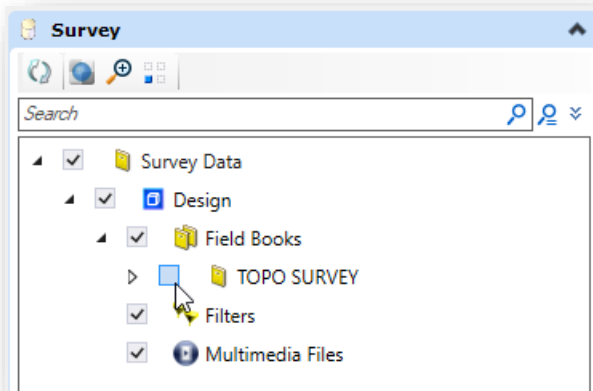
- Import the following CSV file:

**300-Survey\SurveyData\FieldData\RawData\BridgeExample\_TOPO.csv**

This data file contains the topographic survey for the project. The data is imported as shown below.



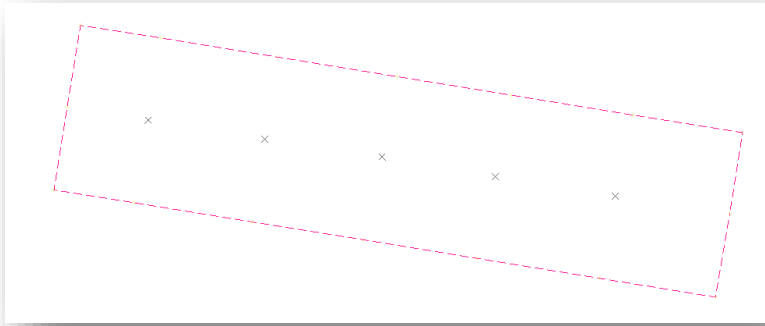
- Turn off the display of the Topo Survey field book by toggling it off in the **Explorer** dialog's **Survey** tab



- Create a second **Field Book** to import the bridge data. Rename the Field Book to “Bridge Survey”
- Import the following CSV file:

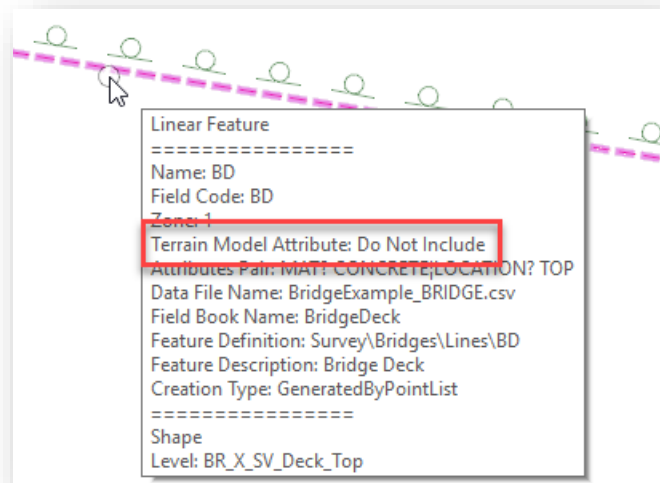
**300-Survey\SurveyData\FieldData\RawData\BridgeExample\_BRIDGE.csv**

The data for the bridge is imported as shown below.

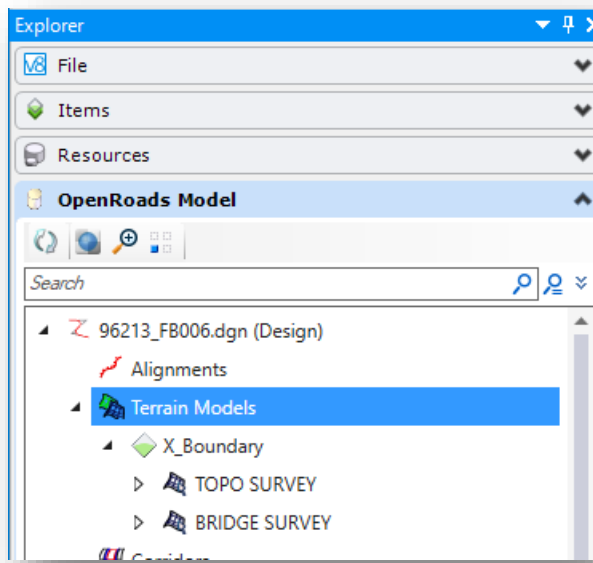


- To create a terrain model for the topo data, right-click on the field book name and choose the **Create Terrain Model...**
  - The terrain model is created using the name of the field book.
  - By default, the terrain model is assigned the **X\_Boundary** feature definition.

The field book containing the bridge deck information will be used to create a second terrain model for the bridge deck. The bridge deck field code BD is defined with the **Terrain Model Attribute** value set to **Do Not Include**.



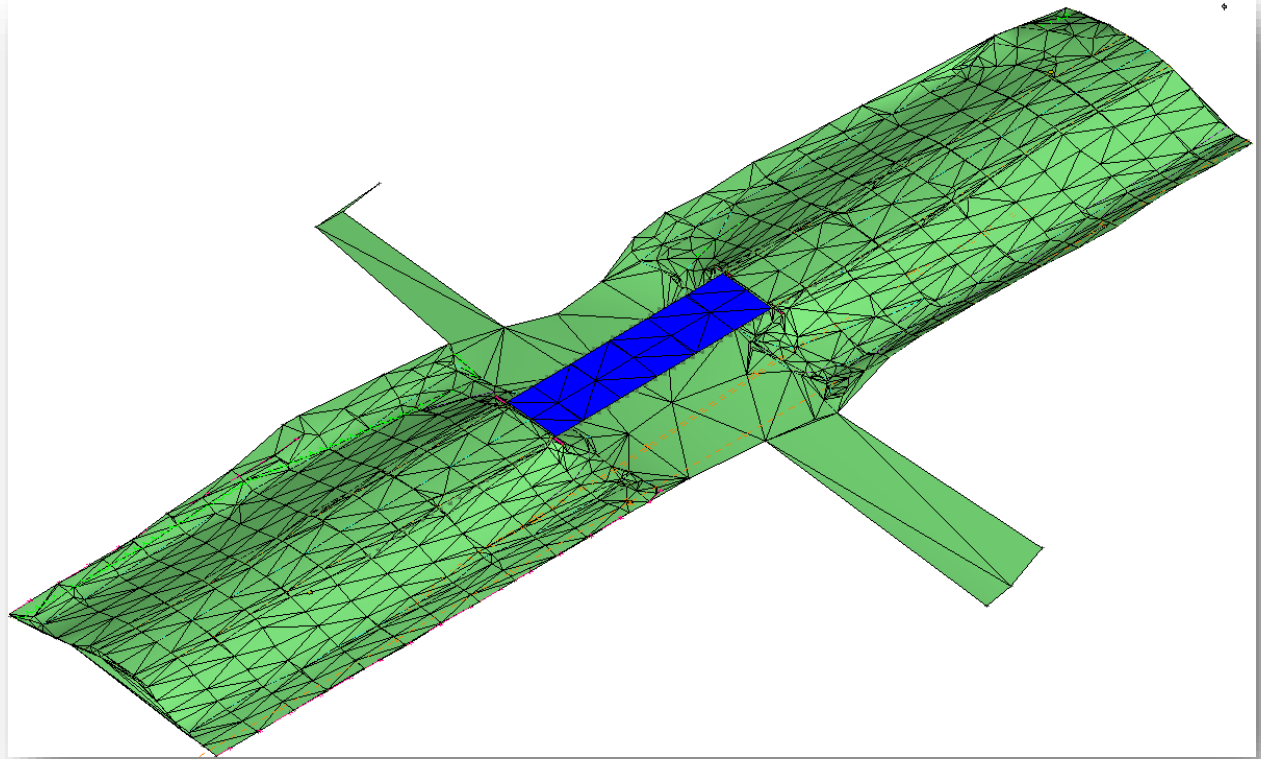
- To include the bridge deck in the terrain model, select the bridge deck element and choose the **Properties** option from the pop-up menu. Change the **Terrain Model Attribute** item to **Boundary**.
- Create the terrain model for the bridge deck by right-clicking on the field book name and choosing the **Create Terrain Model...** option. A second terrain model is created for the project as shown in the **Explorer** dialog's **OpenRoads Model** tab below.



Take the following steps to display the terrain models:

- Change the **Feature Definition** for the Topo terrain model to **X\_Triangles**
- Change the **Feature Definition** for the Bridge terrain model to **X\_Triangles2**
- Change the **View Display Style** to **Illustration**

An example of the completed terrain models for the project is shown in a rotated view below.





## OpenRoads Software Version

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This document was prepared using the following software version:

OpenRoads Designer CONNECT Edition – 2019 Release 1 - Update 7 – Version 10.07.00.56

## Contacts

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For any questions, suggestions, or problems with this document please contact the ODOT Office of CADD and Mapping Services by use of the following form on the ODOT website:

[https://odot.formstack.com/forms/cadd\\_servicerequest](https://odot.formstack.com/forms/cadd_servicerequest)

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