CONNECT DDE GUIDE

CONNECTICUT DEPARTMENT OF TRANSPORTATION

DIGITAL DESIGN ENVIRONMENT GUIDE

CONNECT EDITION

Volume 3.5 – OpenRoads Designer Quantities

Published Date: March 12, 2025

Table of Contents

Course Overview

In this volume you will learn how to set up the project framework for Design file referencing. You will also get a quick start look a navigating the OpenRoads interface. This guide will not document each tool that is available on the OpenRoads interface. See the online help for commands not detailed in this document.

[OpenRoads Designer CONNECT Edition Help](#)

Skills Taught

- Design File Referencing Framework
- General Tools and Interface

Exercise 1 - Getting Started

1.1   Placement Tools

1.1.1   The Highway Tab

The Highway tab on the CTDOT workflow will be used to place 2D Linear Elements, Shapes and Cells.

The Highway **Linear, Area, and Cells** tools do not automatically attach Item Types. Item Types will be attached after placement by using the Properties toolbox or the Attach Item Tool.
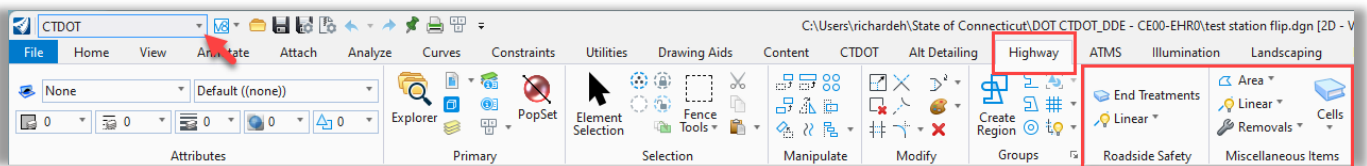

Figure 1 – CTDOT Highway Ribbon

Element Templates have been created for common pay items and can be selected under the **General >Template** property by browsing to **Highway\PAY ITEMS\...**and selecting as needed.
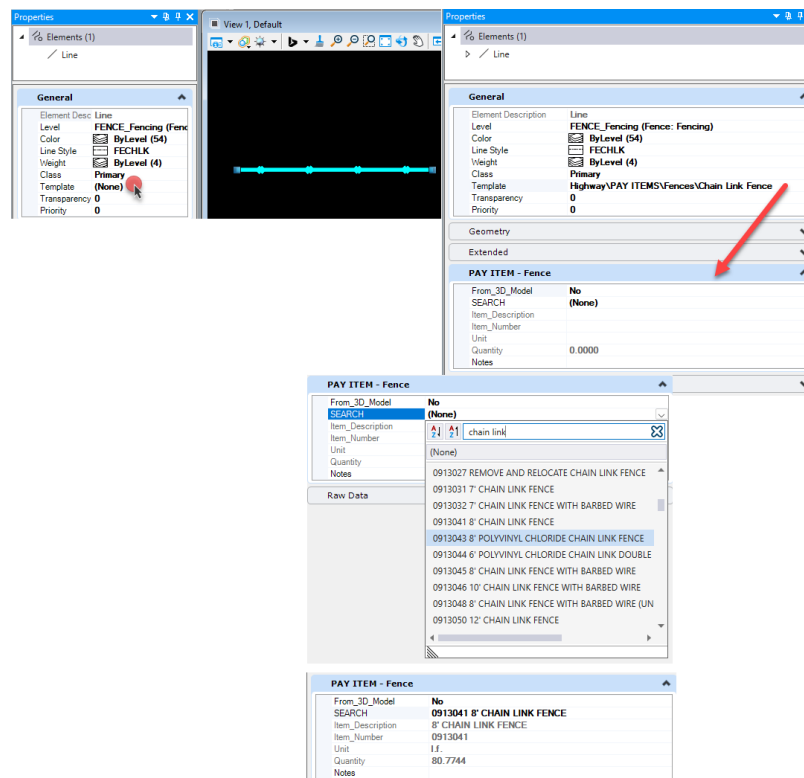

Figure 2 – Update using Element Pay Item Template

1.1.2   Attach and Detach tools

Item Types can also be directly attached to a graphical element using the Attach Item Tool.
Item Type Tools can be found on the Attach Tab in the Item Types Group.

- Attach Item - Allows you to attach an item to an element.
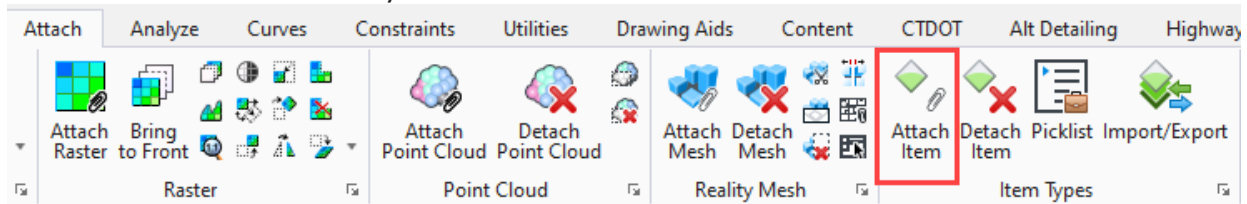- Detach Item - Allows you to detach an item from an element.
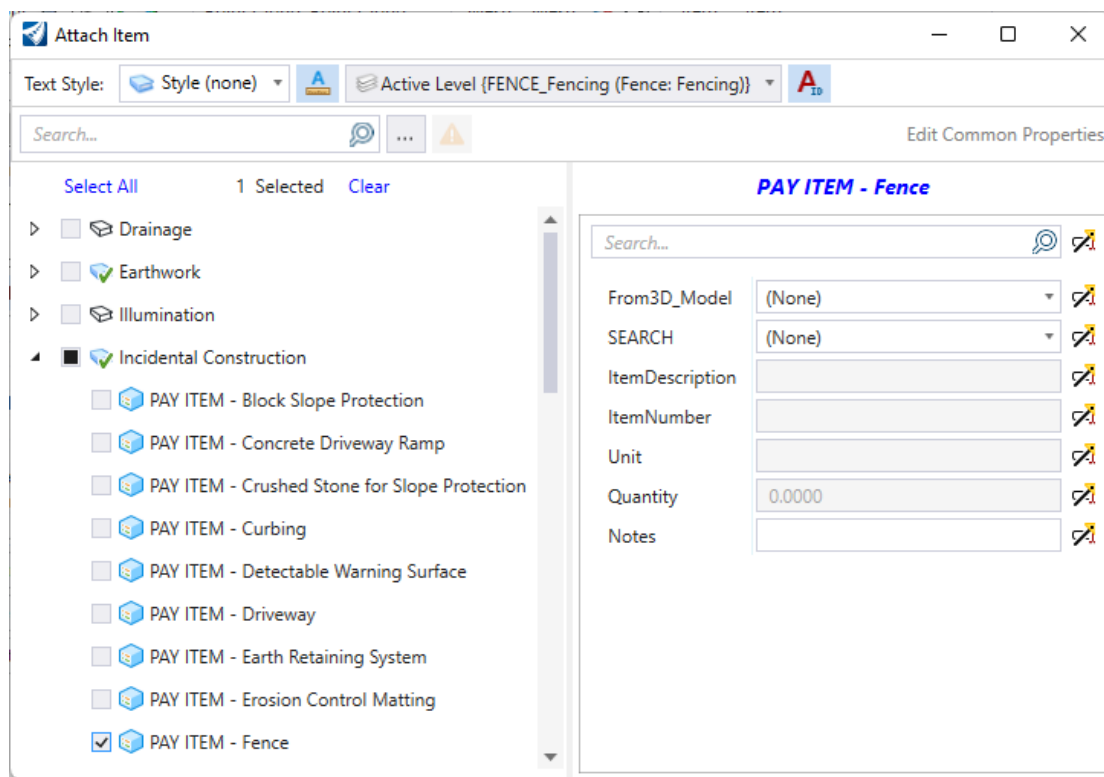
Figure 3 – Attach Item Type

Figure 4 – Attach Item dialog box

1.1.3 Feature Definitions

Graphics can be placed with OpenRoads Geometry tools, the required Item Types will be automatically assigned when using these tools.

- Liners Feature Definitions have been created under **Linear \ Roadway 2D Pay Items \ Pay Items \ ...**
- Point Features for Guiderail Ends **Point \ Pay Item – Guide rail \ ...**
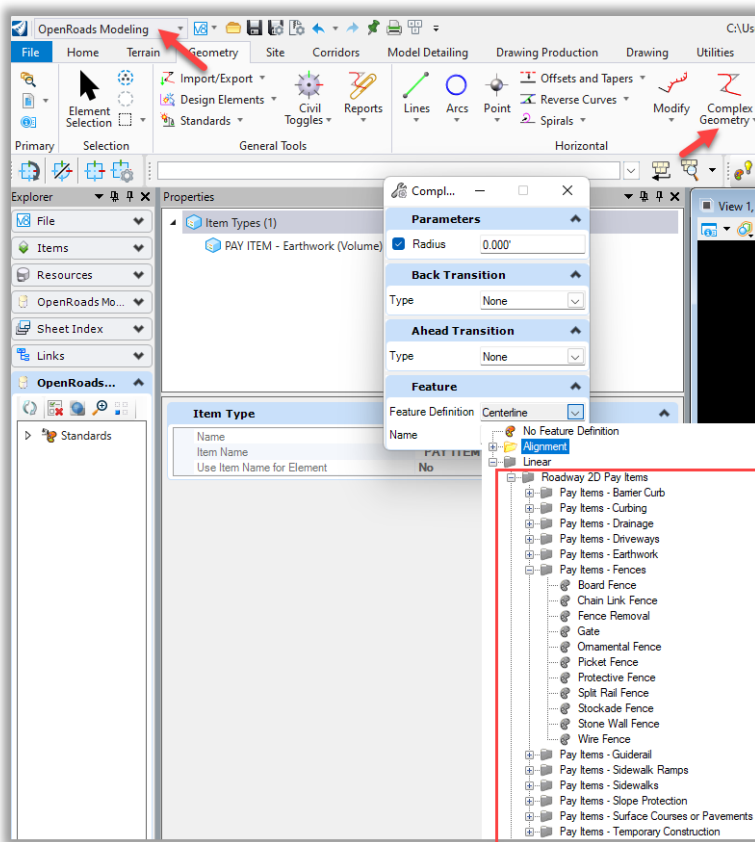- Drainage and Utility Nodes and Conduits also come the Pay Item Item Types Attached
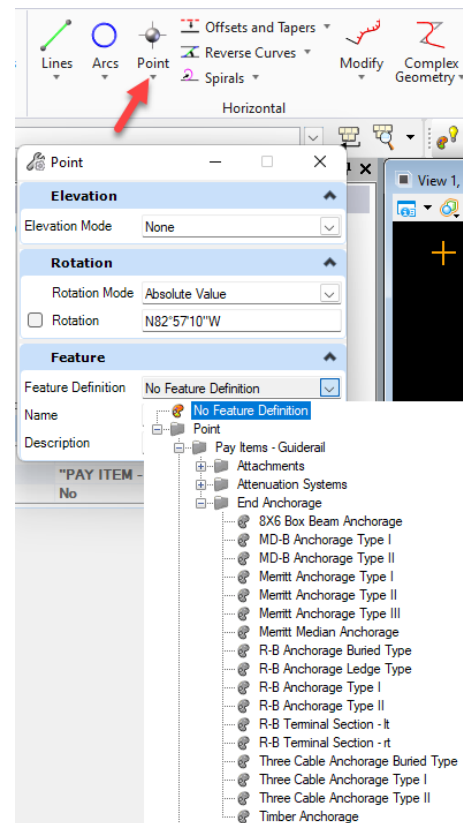
Figure 5 – OpenRoads Linear Features

Figure 6 – OpenRoads Point Features

1.2   CTDOT Custom Item Types

An Item Type is a user defined set of properties used to describe graphical and non-graphical information of an object or element. Item Types are set up and managed by the CTDOT CAD administrators as part of the delivered workspace. Item Types will be attached after placement for elements such as lines and shapes. The workspace has been set up for certain Cells to have Item Types attached upon placement. The properties of an Item Type can be edited by the user in the Properties dialog box along with the other properties of an element. The properties in Item Types can be used to label and report.

CTDOT Item Types are connected to the Department's Master Bid List that contains pay item numbers, descriptions and units. Users will enter the required pay item description and the item number and pay unit fields will auto-populate. The most up to date Master Bid Item Lists can be found on the Department's Contract Development Website.

In the image below notice the look up information is grayed out and the user input is not. The greyed-out properties are getting auto-populated by other Item Type property fields or other attributes on the file itself. Some user input fields are pick lists and others are strictly manual input.
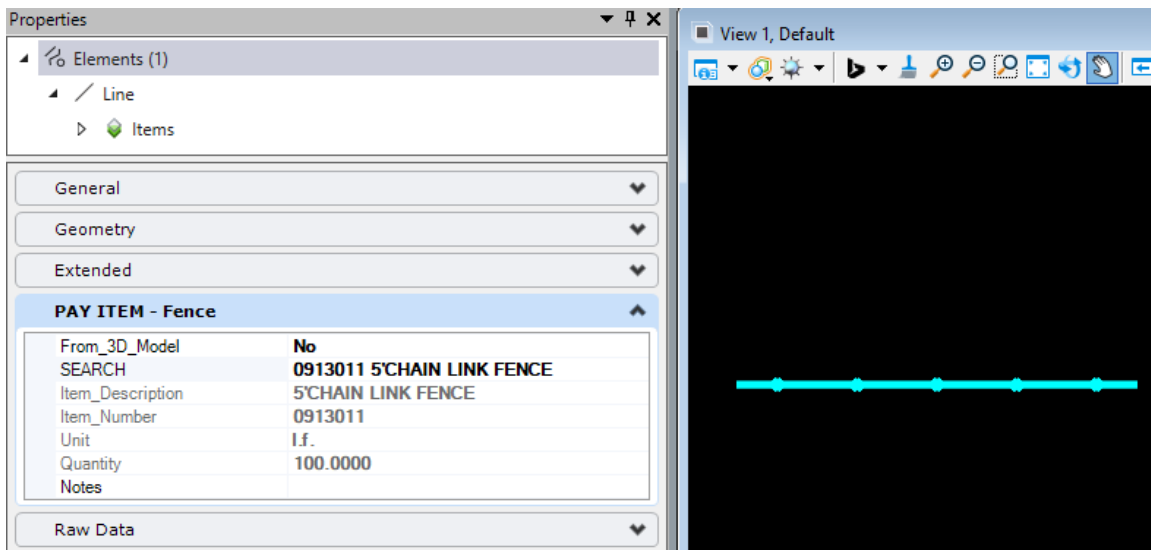

Figure 7 – Fence Pay Item

1.2.1　Pay Item Properties

- **SEARCH –** uses a pull-down menu, by selecting the down arrow in the Property Definition, and entering part of an Item Description or Item Number, a selection pick list will appear.
  Note: *you can enter any word in the description or Number, and it will filter regardless of the order.*
- **Item_Description –** uses a look up table and will update based on the selected SEARCH Property.
- **Item_Number** - uses a look up table and will update based on the selected SEARCH Property
- **Unit** - uses a look up table and will update based on the selected Item_Description.
- **Quantity –** uses graphs and or a mix of equations to comupte the results based in the Unit.
- **Notes** - Type in as needed.
- Optional Properties used are on some Item Types are:
  - **Thickness**
  - **Factor**
  - **From_3D_Model**

1.2.2　Asset Information

The following CTDOT assets will be tracked moving forward so all Property fields in the Item Types below should be fully populated and filled out for each item placed in a project.

Roadside Safety
- BARRIER CURB
- END TREATMENT
- GUIDERAIL

1.2.3　Item Types Manager

Available Item Types can be viewed by selecting the small box on the bottom right corner of the Item Types section.
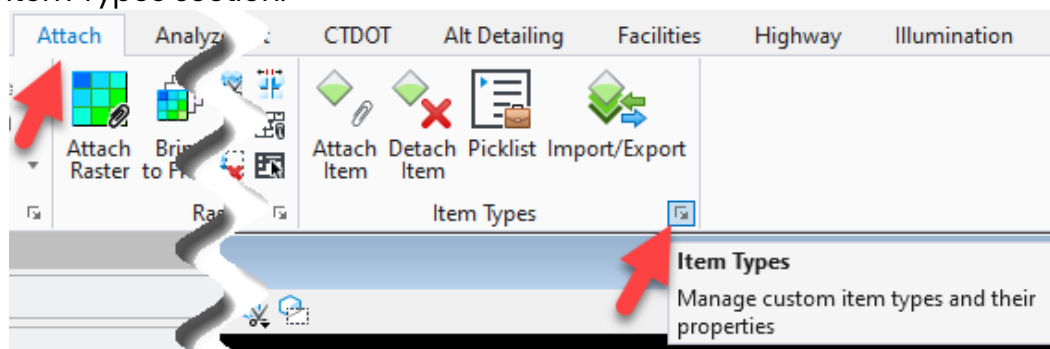

Figure 8 – Item Types Manager

1.3   Excel Export

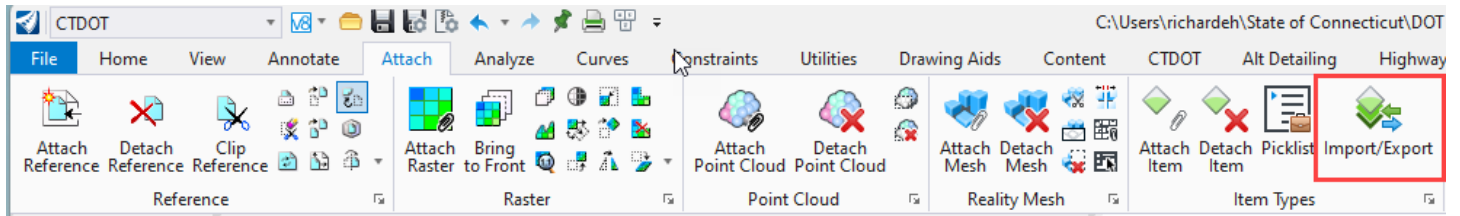The Import / Export tool allows you to export Item Type data to Excel.

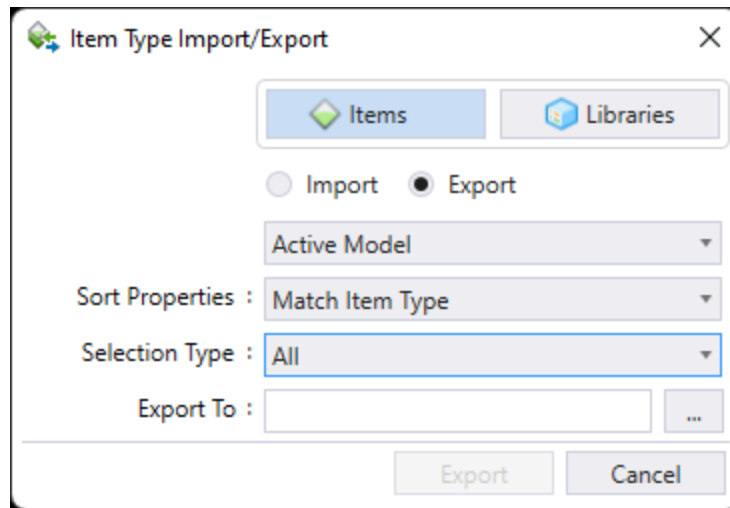*Figure 9 – Item Type Import / Export tool*

Figure 10 – Item Type Import / Export dialog box

Exercise 2 - Quantifying Guiderail

These instructions will guide users through placing guiderail features and provide layout steps. Pay Items as well as Asset information will be tagged to each feature through Item Types. During placement each piece of linear guiderail, end anchors, bridge attachments and impact attenuators will come with the preset (most common) bid item number. These bid items can always be modified after placement for those out of the ordinary circumstances.

1. Create a new file and save it to your Base Model folder, *HW_CB_1234_1234_Quantities.dgn*.

2. All the Items placed in a file can be viewed in the **Explorer** dialog box under **Items**. This should be reviewed to make sure all the Items are placed correctly.

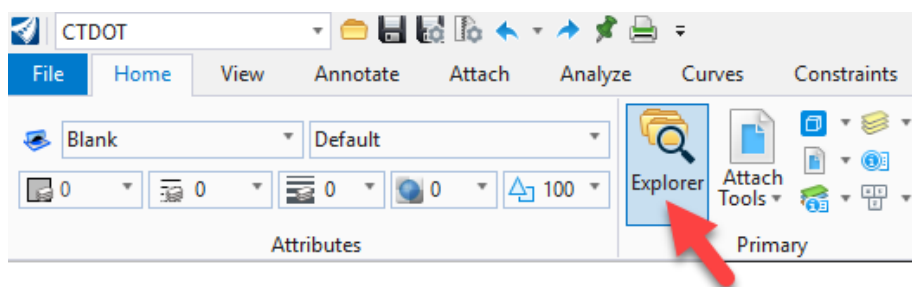3. If you do not see the Explorer dialog box, click on the **Home** tab and select the **Explorer** button.

Figure 11 - Explorer Icon

4. If you do not see the Items section, click on the **File** tab. Select *Settings > Explorer Settings*. Toggle **Yes**, to all the fields in the Items section and click **OK**.
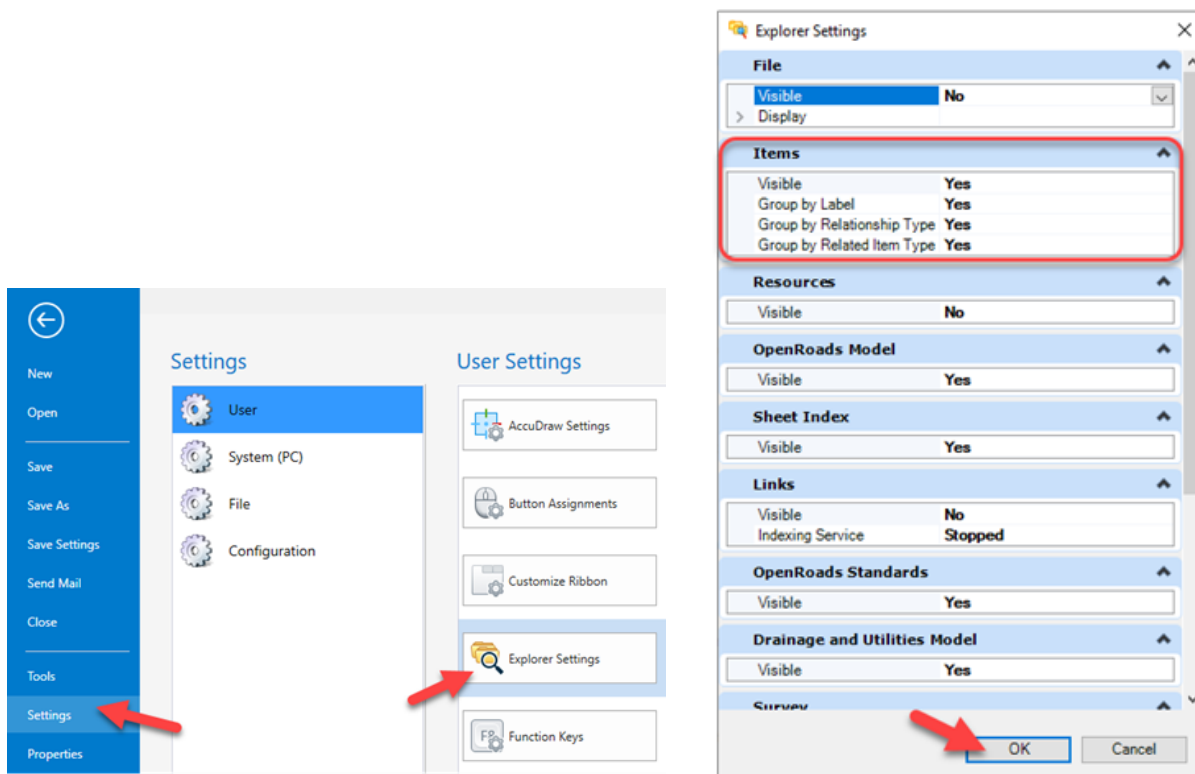

Figure 12- Explorer Settings

5. In a real-life project scenario, the edge of road will already be placed in the design before the guiderail layout begins. For the purposes of this exercise, we will place a line to represent the edge of road. Select the **OpenRoads** Workflow, on the **Geometry Tab**, in the **Horizontal** section select the **Lines** icon. The Lines dialog box will appear, for **Feature Definition** select *Linear|Roadway Geometry|Edge of Pavement Line*. Follow the prompts and place a 100-foot line.

6. Switch the workflow to **CTDOT**, on the **Home** tab, in the Manipulate area select **Copy**.

7. In the **Attributes** section, change the Element Template to **None** and the Level to **Default.**

8. Now move the line Parallel. Select the **Move Parallel** tool.

   - Turn on distance and enter *2*.
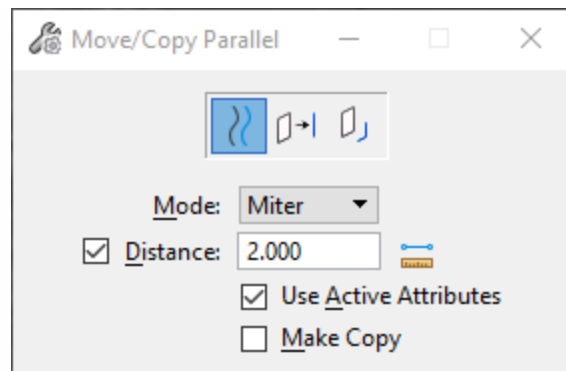
   - Turn on Use Active Attributes

   - Make Copy not set

Figure 13 - Copy Parallel Dialog Box

9. Change use the **Place Smart Line** tool to place the flared Guiderail sections and trim the parallel line to the flared sections.

10. In the **Search** ribbon type *Create Complex Chain* and select the tool. Follow the prompts and select each section of Guiderail to create a complex chain. Break the line where needed to add sections for different post spaced pay items.

Volume 3.4 – OpenRoads Designer Quantities

11. Switch the Workflow to **OpenRoads Modeling**, in the **Geometry > Horizontal > Offsets and Tappers > Single Offset Entire Element.**
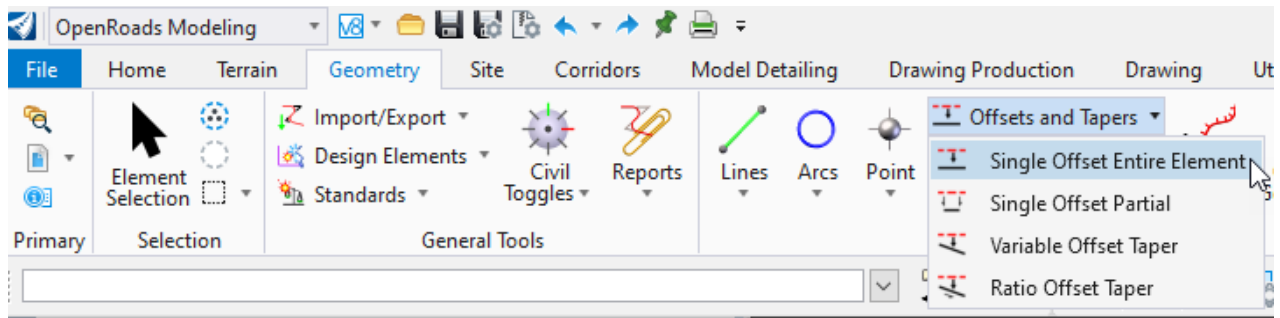

Figure 14 - Single Offset Entire Element

12. In the dialog box

Offset = **ON** & set to **0**

Remove Offset Rule **ON**

Feature = **Linear > Roadway 2D Pay Items > Pay Items – Guiderail > MBR**
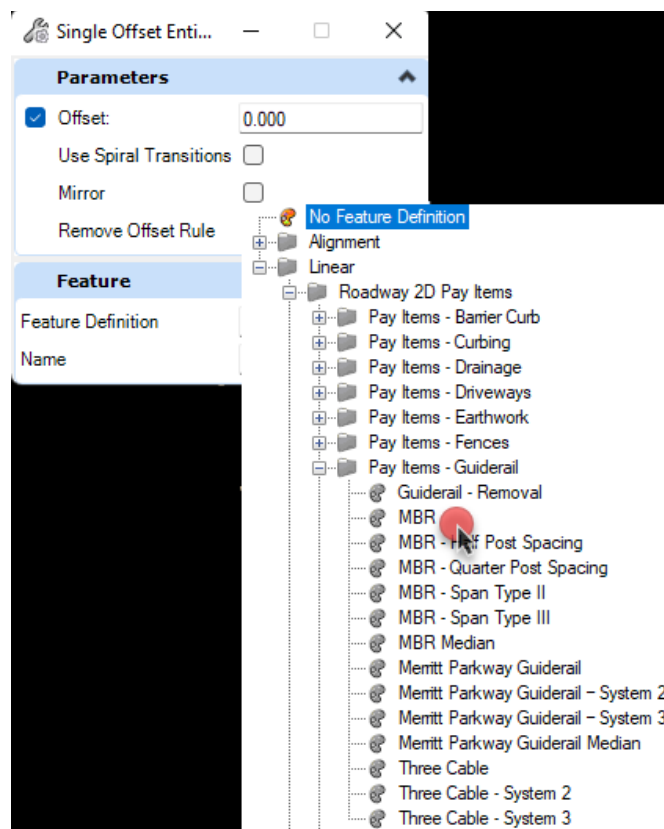

Figure 15 - Linear Guiderail Feature Selection

13. Select the first line and follow the prompts place the Feature. Move on to the next segment if one exists and change the Feature Definition as required if the post spacing changes.

14. Add the Point Features End treatments. On the **Geometry** tab's **Horizontal** section select **Point.**

Feature Definition: select as needed there are different folders to help searching through the types.

Points > Roadside Safety > Attachments...

Points > Roadside Safety > Attenuation Systems...

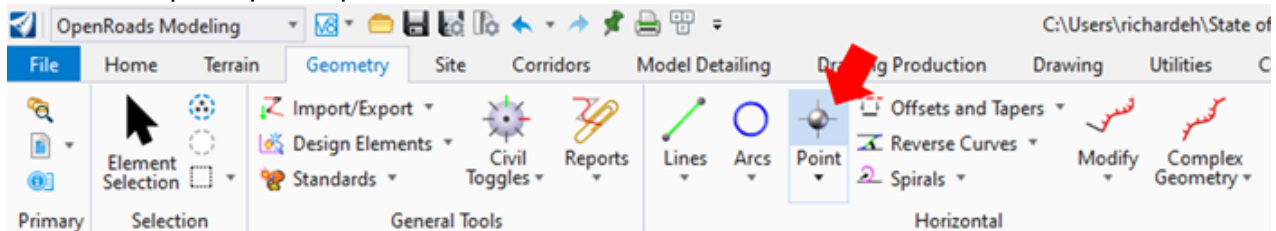**Points > Roadside Safety > End Anchorage...**

Follow the prompts to place the Cells.
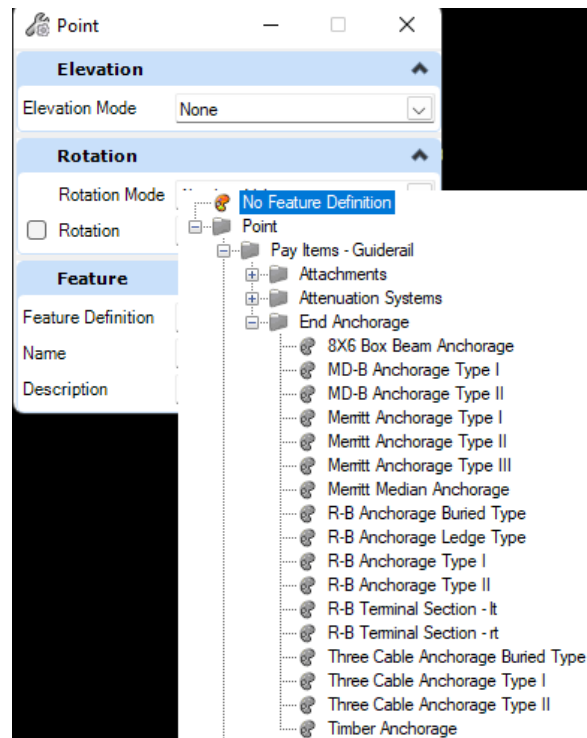

Figure 16 - Place Point Feature Tool

Figure 17 – Point Guiderail End Feature Selection

15. Select the Lines and Points just placed and fill in the **RB-Run_ID**. Use the **SEARCH** field to look up any needed changes to the Pay Item, the Pay Item Number or Description can be entered to search.
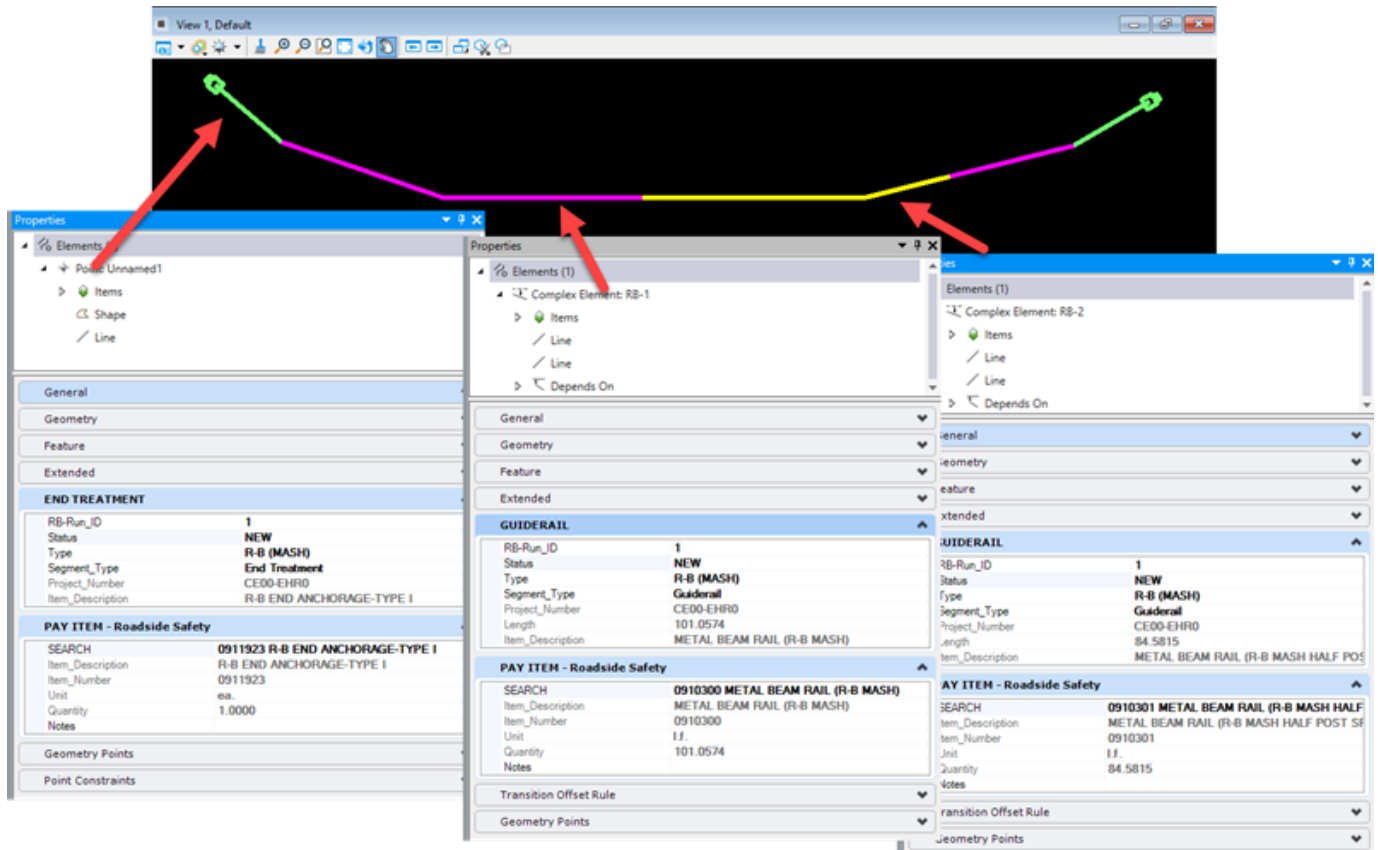

Figure 18 - Add Run ID's

Exercise 3 - Drainage

Coming Soon

Exercise 4 - Volumes

Coming Soon