CONNECTICUT DEPARTMENT OF TRANSPORTATION

DIGITAL DESIGN ENVIRONMENT GUIDE

CONNECT EDITION

Volume 3.5 – OpenRoads Designer Quantities

Volume 3.4 – OpenRoads Designer Quantities

Course Overview

Introduction

Highway Tab

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

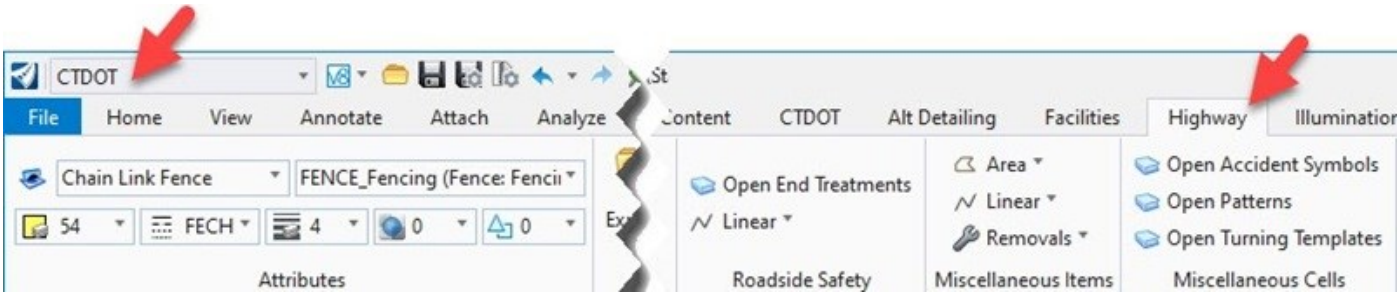

Figure 1

The tools in the **Linear and Area** pull down menus do not automatically attach Item Types like the **Roadway Safety End Treatment Cells**. Item Types will be attached after placement by using the Properties toolbox or the Attach Item Tool. Templates have been created for common pay items and can be selected under the **General >Template** property by browsing to **Roadway \ PAY ITEMS \ ...**and selecting as needed.

As described above in the Item Types Overview. Users will enter the required pay item description and the bid item number, and the pay unit fields will auto-populate. The Quantity property will pick up the Linear, Count (each), Area, or Volume measurements.

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 actually pick lists and others are strictly manual input.

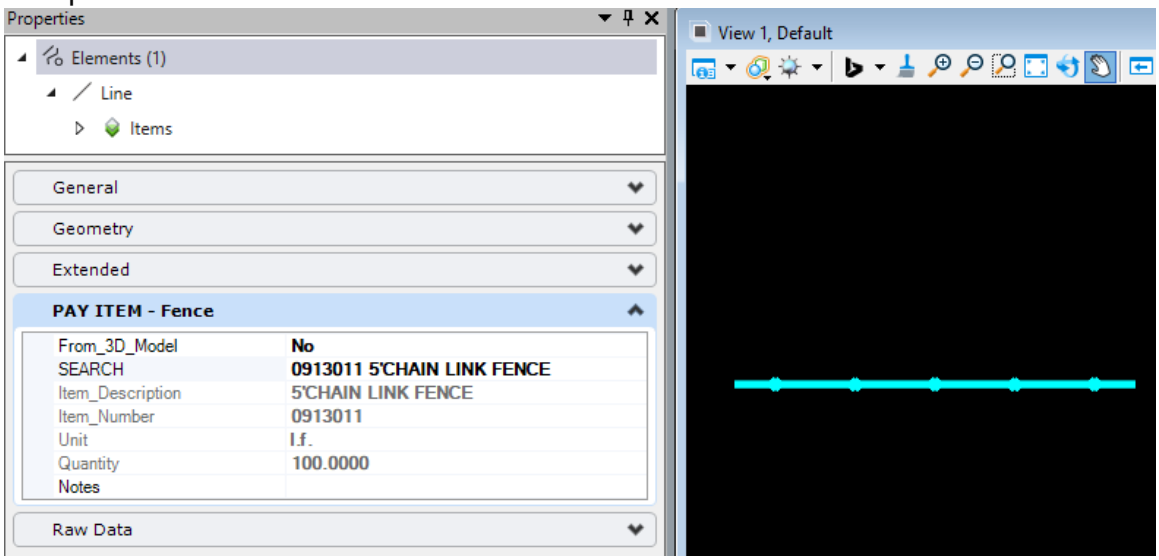

Figure 2

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 compute the results based in the Unit.
- **Notes** - Type in as needed.
  Optional Properties used on on some Item Types
  - **Thickness**
  - **Factor**

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

Attach and Detach tools

Item Type Tools can be found on the Attach Tab.

- Attach Item - Allows you to attach an item to an element.
- Detach Item - Allows you to detach an item from an element.

Item Types Manager

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

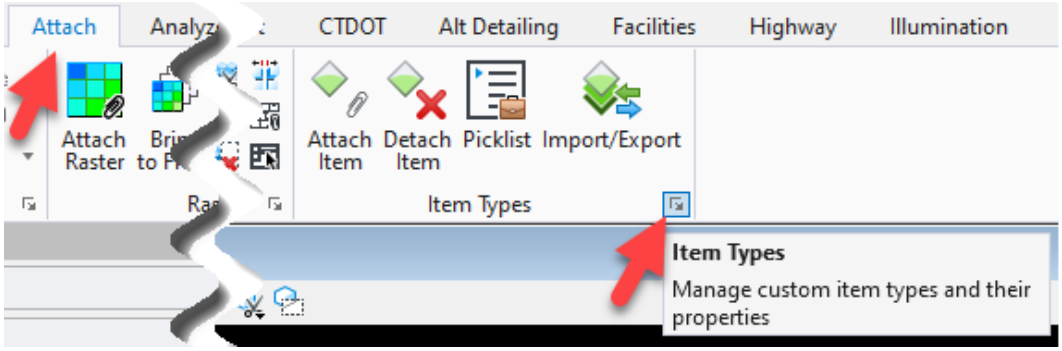

Figure 3

Report Definitions

Report Definitions are available through the Reports dialog box. A Report Definition for these 2D roadway items has been defined and can be used to create quantity reports. This Report Definition is a way to extract and present data from a DGN file in tabular format. Reports can be placed as a table as well as exported to Excel workbook or .csv files. A predefined report has been created for use under Roadway called Pay Items.

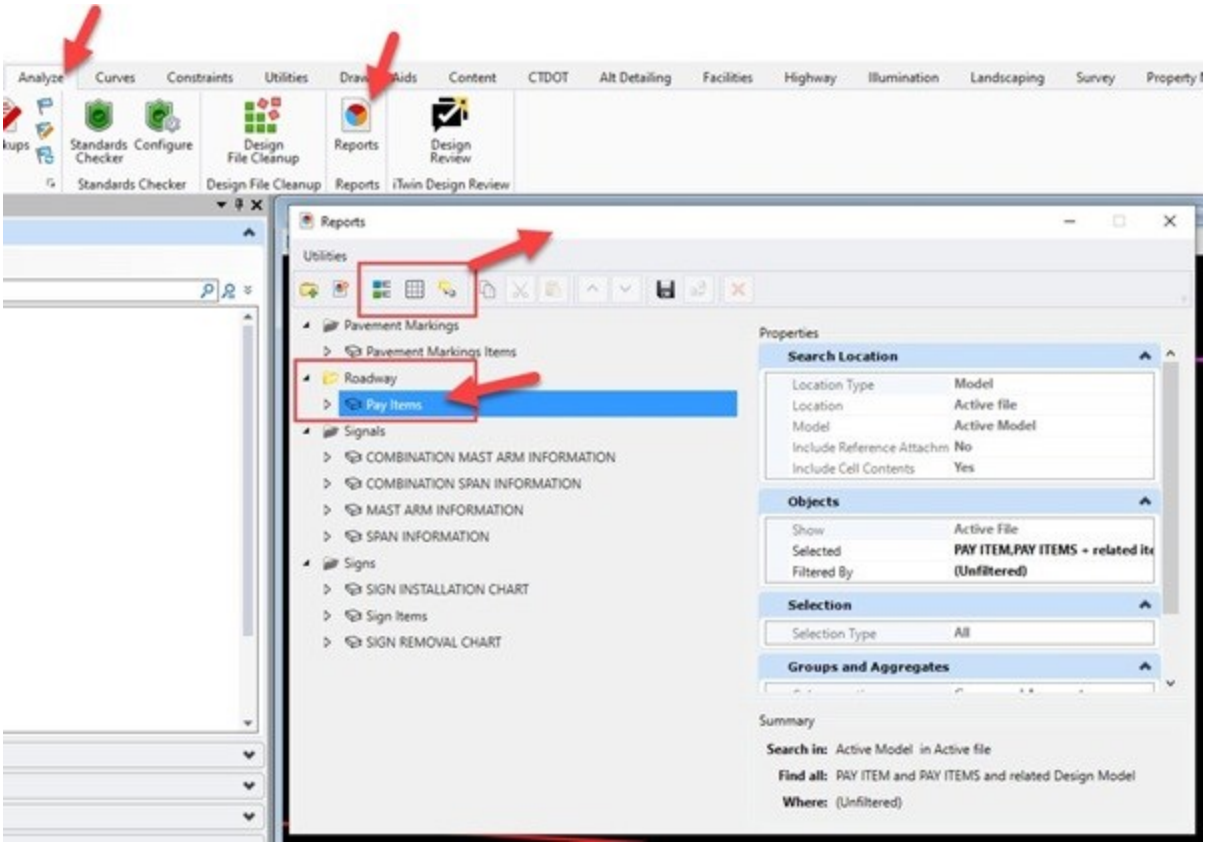

Figure 4

Exercise 1 - 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.

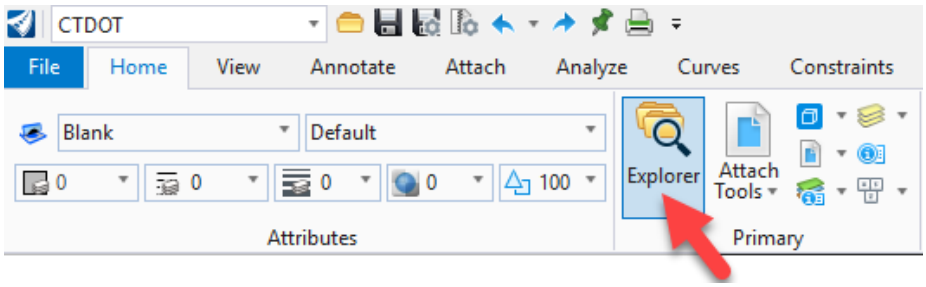

Figure 5 Explorer Icon

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**.

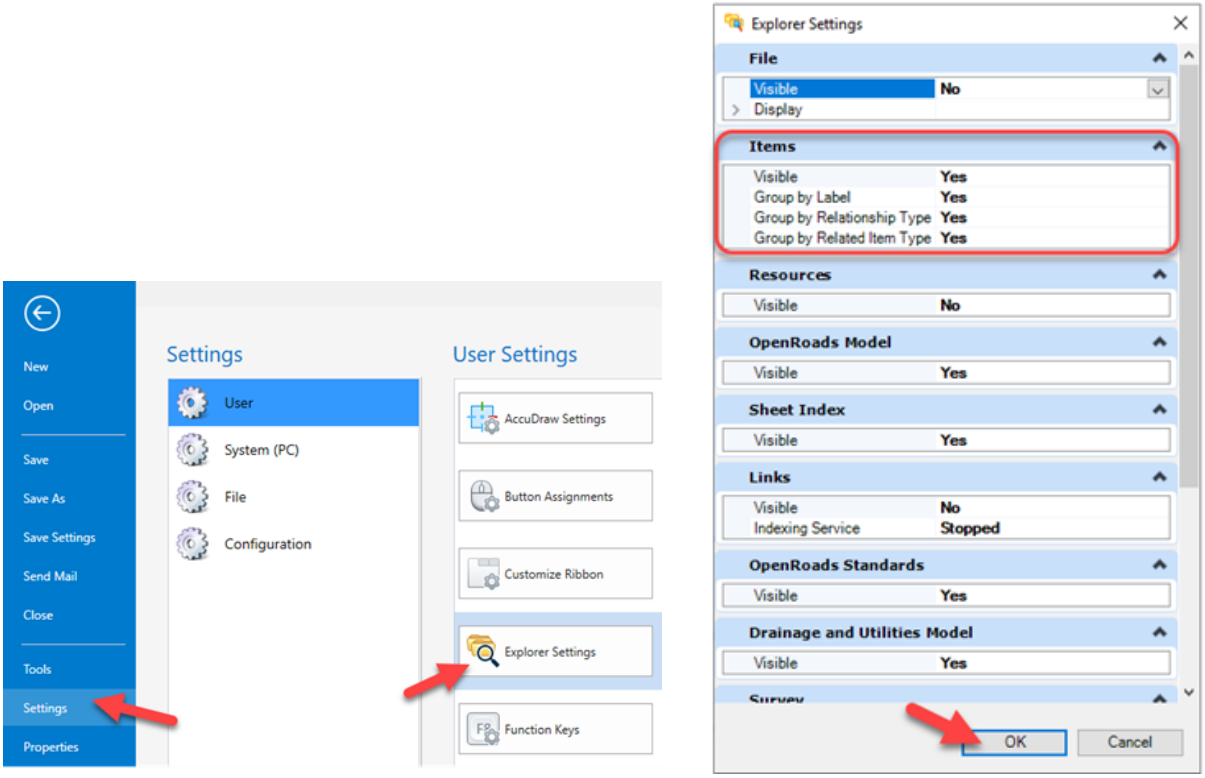

Figure 6 Explorer Settings

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

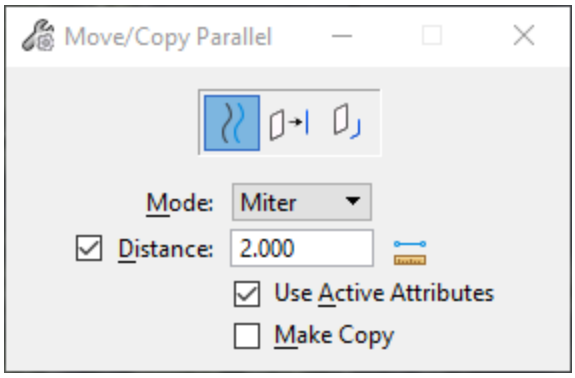

Figure 7 Copy Parallel Dialog Box

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.

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

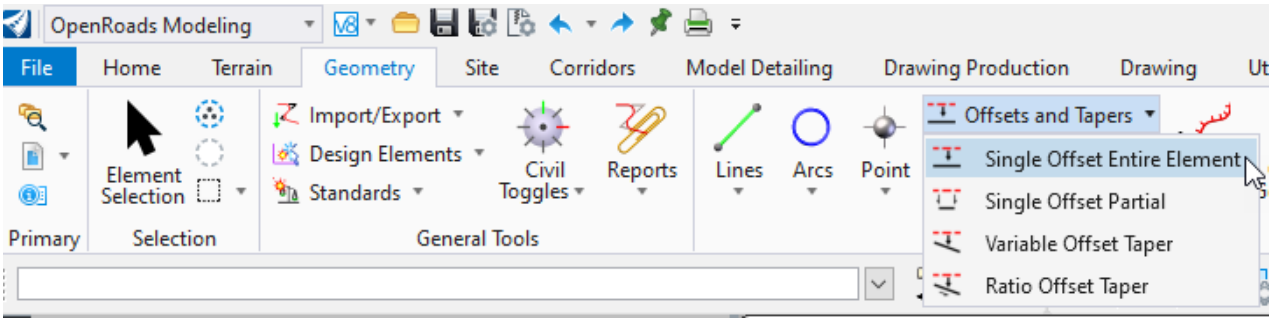

Figure 8 Single Offset Entire Element

12. In the dialog box

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

    Remove Offset Rule ***ON***

    Feature = ***Linear > Roadside Safety > Pay Items – Guiderail > MBR***

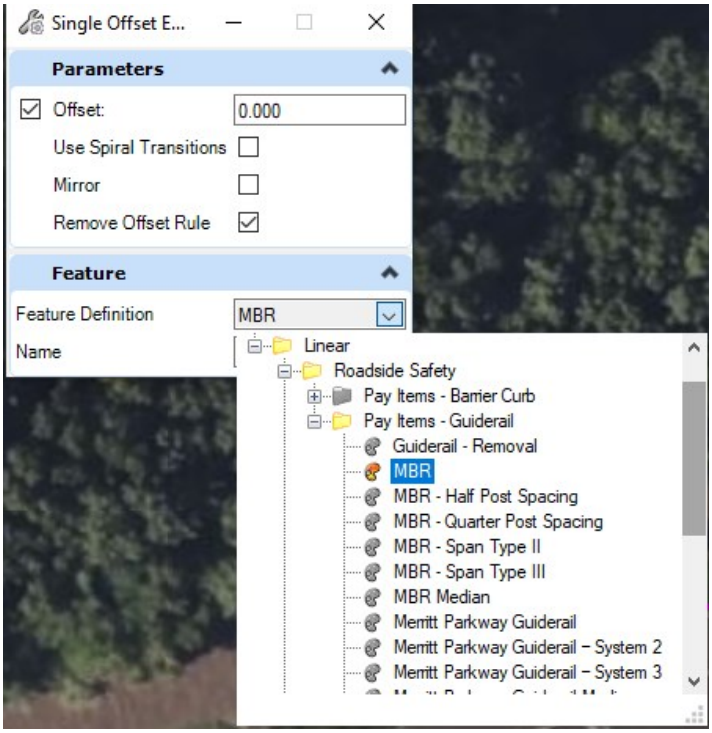

Figure 9 Linear Guiderail Feature Selection

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.

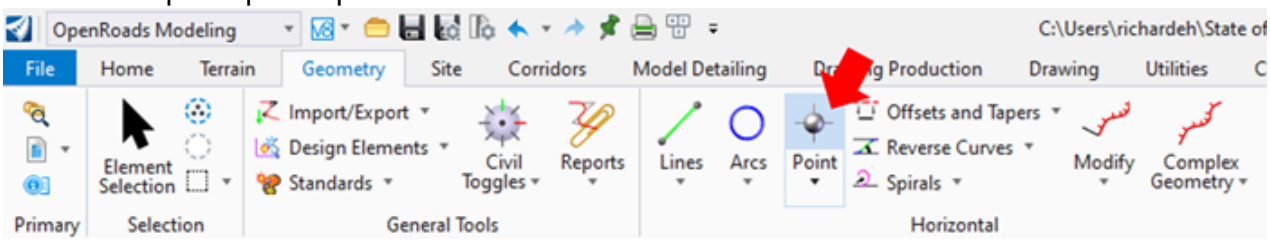

Figure 10 Place Point Feature Tool

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.

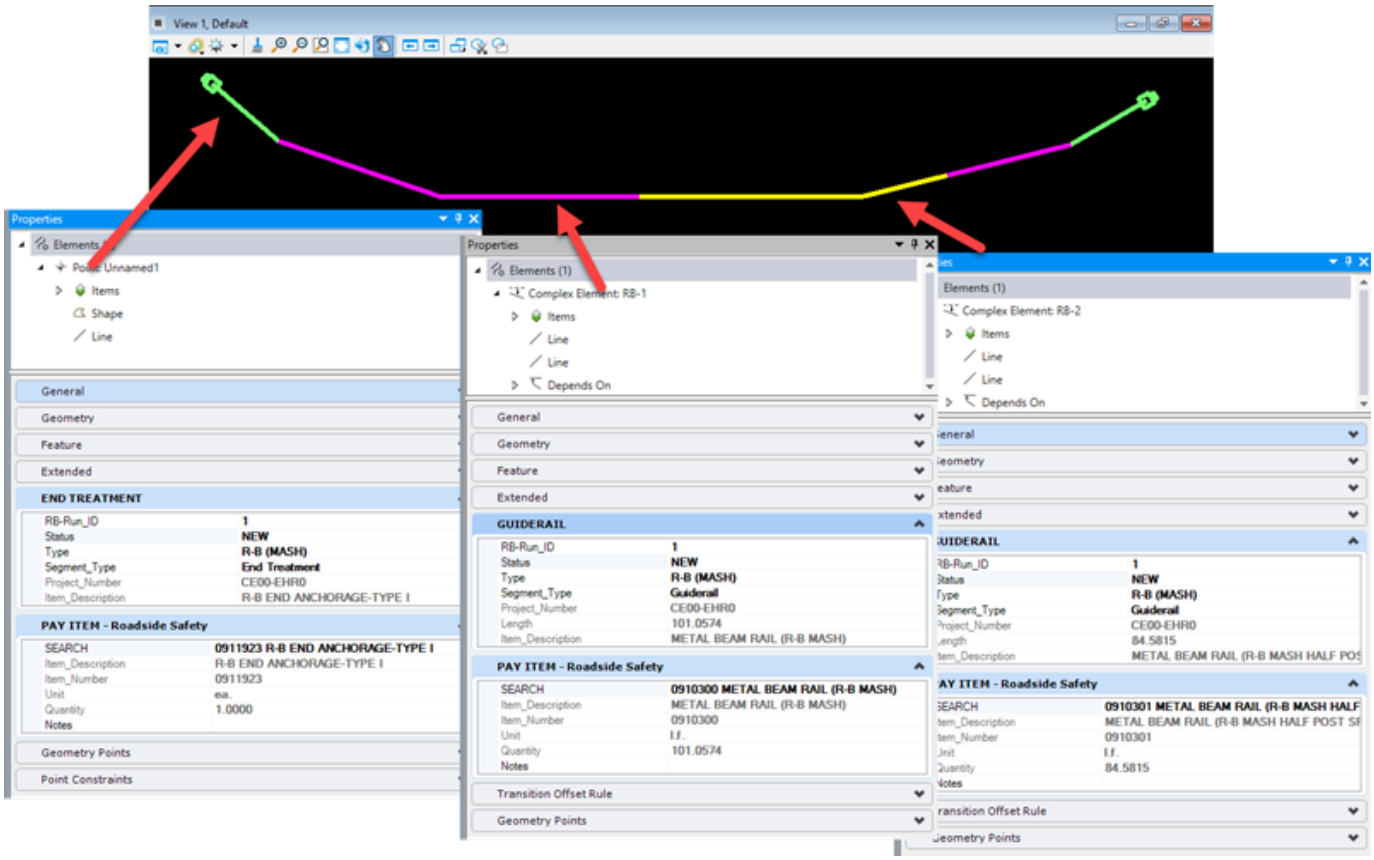

Figure 11 Add Run ID's

16. To view a report of the placed Items, select the **Analyze** tab and select the **Reports** icon.
17. On the Reports dialog select ***Roadway / Roadway Safety Pay Items*** and click in the **Preview Results** icon. A list of all the graphical elements using the PAY ITEMS Item Types will appear.

18. If you would like to report on graphical elements that are in a referenced file, right click on the ***Pay Items*** Report Definition and click **Save to active file**. In the properties section select ***Yes*** to **Include Reference Attachment**.
19. To export the report to Excel click on the **Export results** icon and browse to save the report.

Exercise 2 - Drainage

Coming Soon

Exercise 3 - Volumes

Coming Soon

Revisions