



**Production Support Office | CADD**

# **FDOT Automated Quantities (Part 1)**

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# Objective

Explore the workflow for developing and recording/managing quantities for FDOT projects using tools and resources in the FDOTSS4 workspace for MicroStation/GEOPAK or PowerGEOPAK.

- FDOT Standards/Resources
- Overview Automated Quantities Workflow
- Calculate Quantities with D&C Manager
- Export to Quantity Manager Database
- Label Areas
- Add Quantities in Quantity Manager

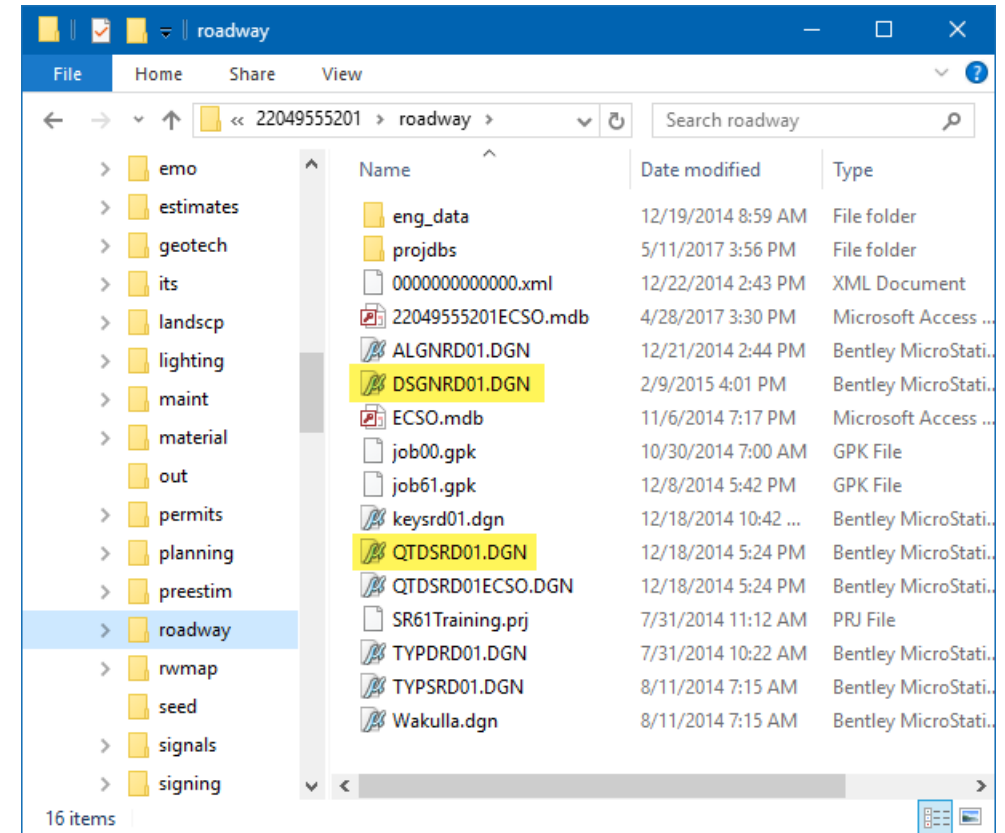
# FDOT Standards

- Specifications
- Design Standards
- Basis of Estimates Manual
  - Master Pay Item List
  - Pay Item Computation Methods
  - Chapter 8, Plan Summary Boxes
- Plans Preparation Manual
- CADD Manual



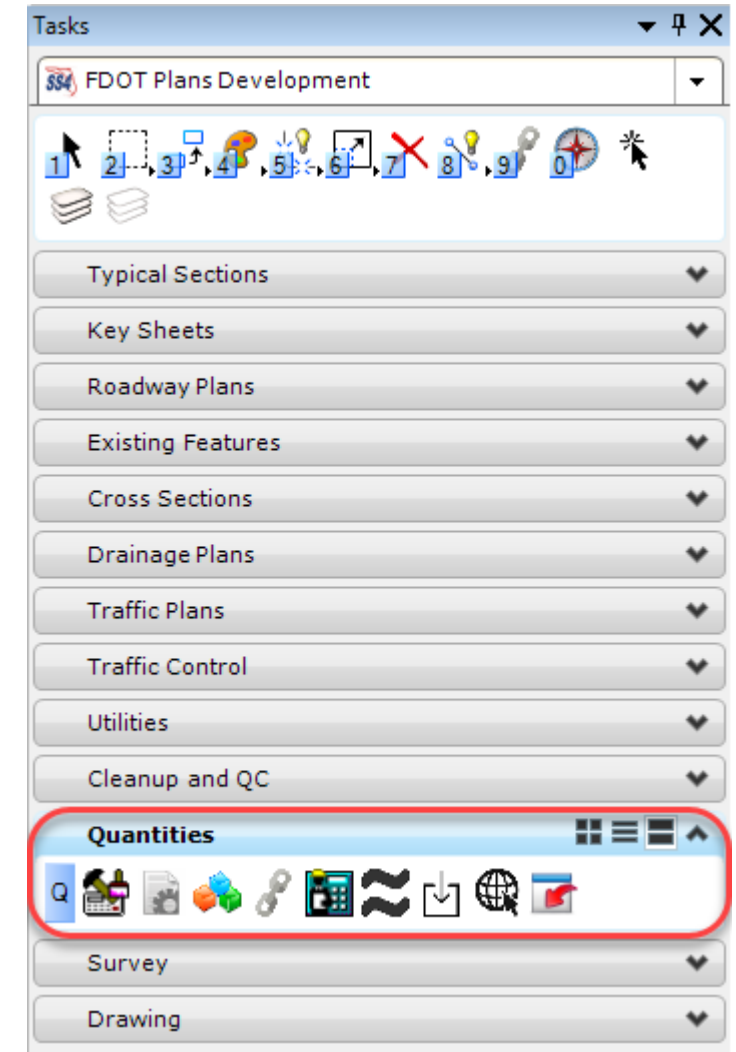
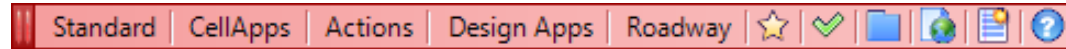
# CADD Standards

- Files
  - DSGN\*\*
    - Linear and Each items
  - QTDSRD\*\*
    - Area/Tonnage/Cubic Yard items
- Quantity Design Files are to be located in the appropriate Discipline directory of the project. This also applies to the Quantity Manager \*.mdb file.
- Create with the Create File/Project tool to insure correct locations and seed files.



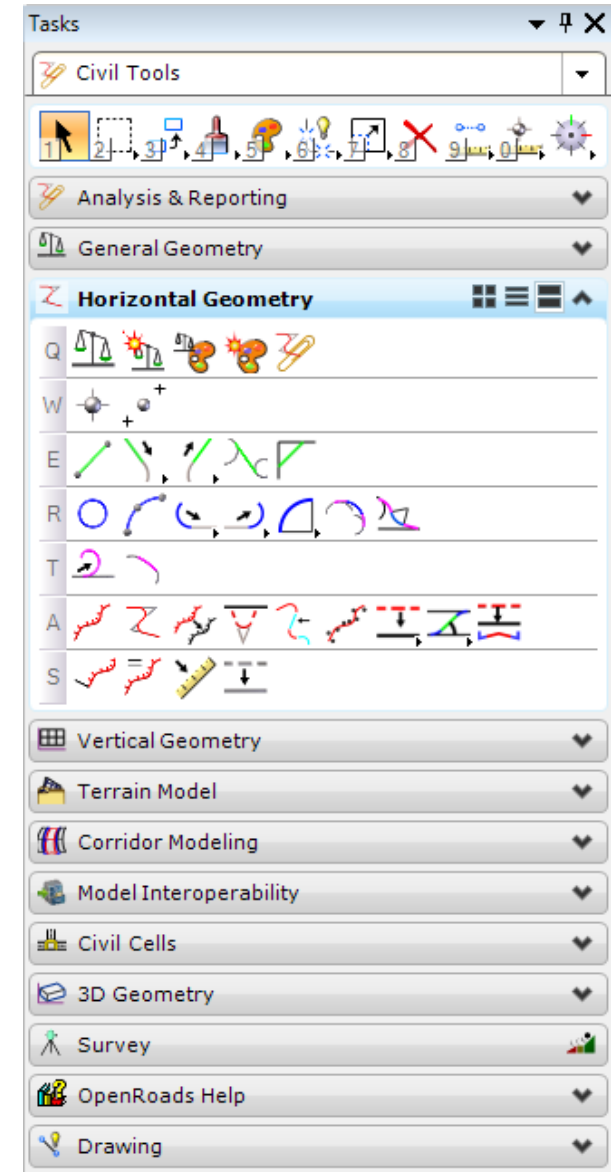
# FDOT Workspace

- FDOT Menu
  - Standard
    - Links to Documentation for Standards
  - Actions
    - Label Shapes with ID
    - LDM
    - AASHTOWare Project Preconstruction links
- Quantities Task Menu
  - Located under FDOT Plans Development
  - Collection of Quantity related tools all in one place



# Linear/Each Features

- Most linear and each quantity features are included in the plan view and therefore drawn in the DSGN\*\* file.
- These elements can be drawn using:
  - D&C Manager in the Design mode
  - Using Civil Features
    - Many of the FDOT Features are set up to use “Native Style”. This means that in the background it is using the D&C settings to define the element. With most of the Civil Tools, this will include the adhoc attributes.
    - CHECK the adhocs set on the elements.
      - No ability to modify the default values when placing with Civil Tools. Do they need to be modified?
        - Use the 3pc AdHoc Attribute tool to make changes.

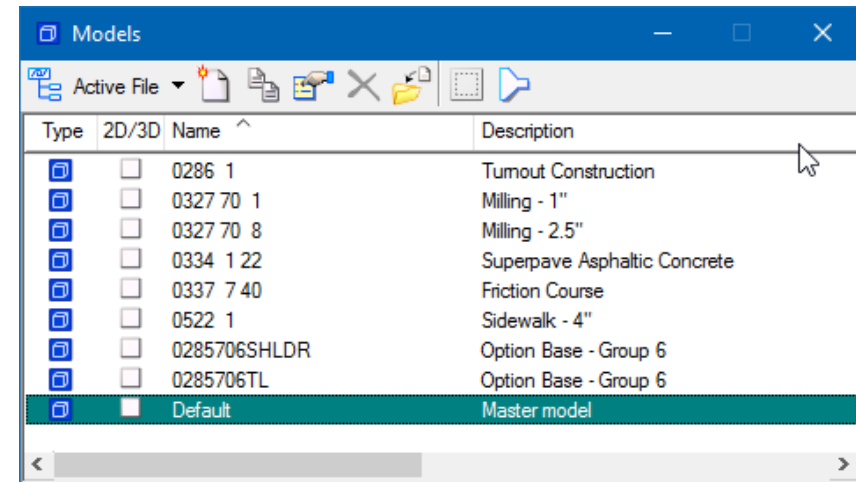
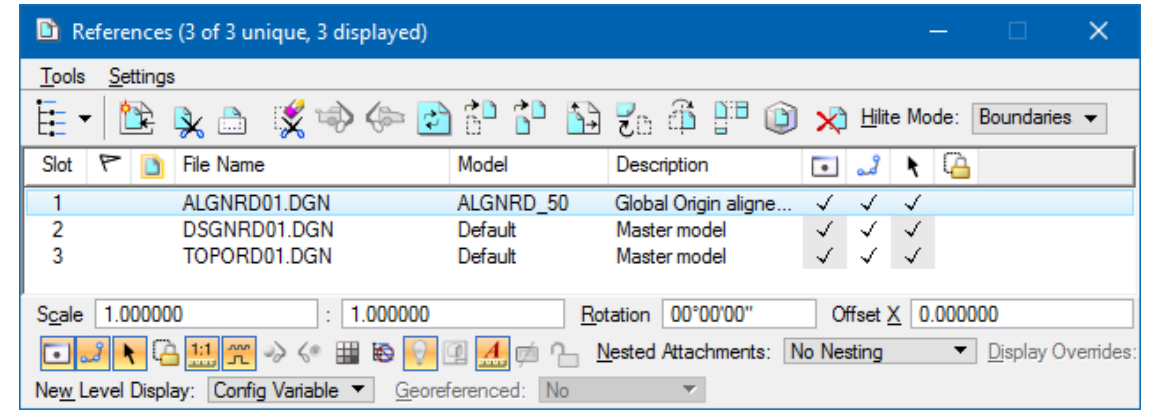


# Area Quantities

## QTDSRD\*\* Set Up

### Recommended workflow:

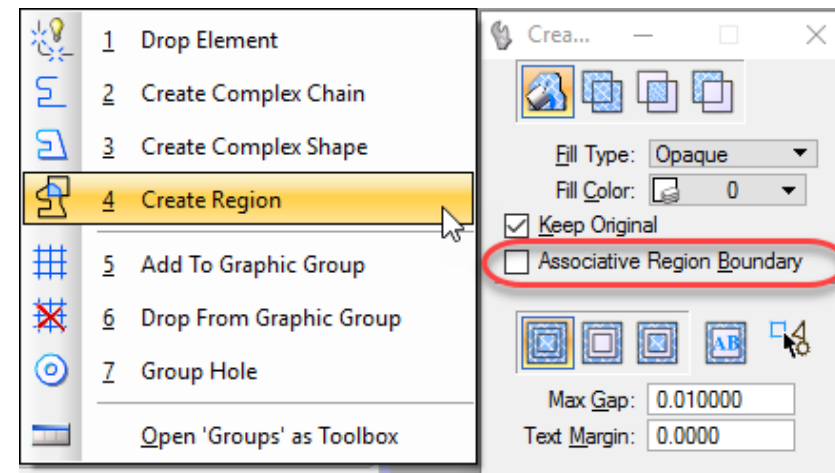
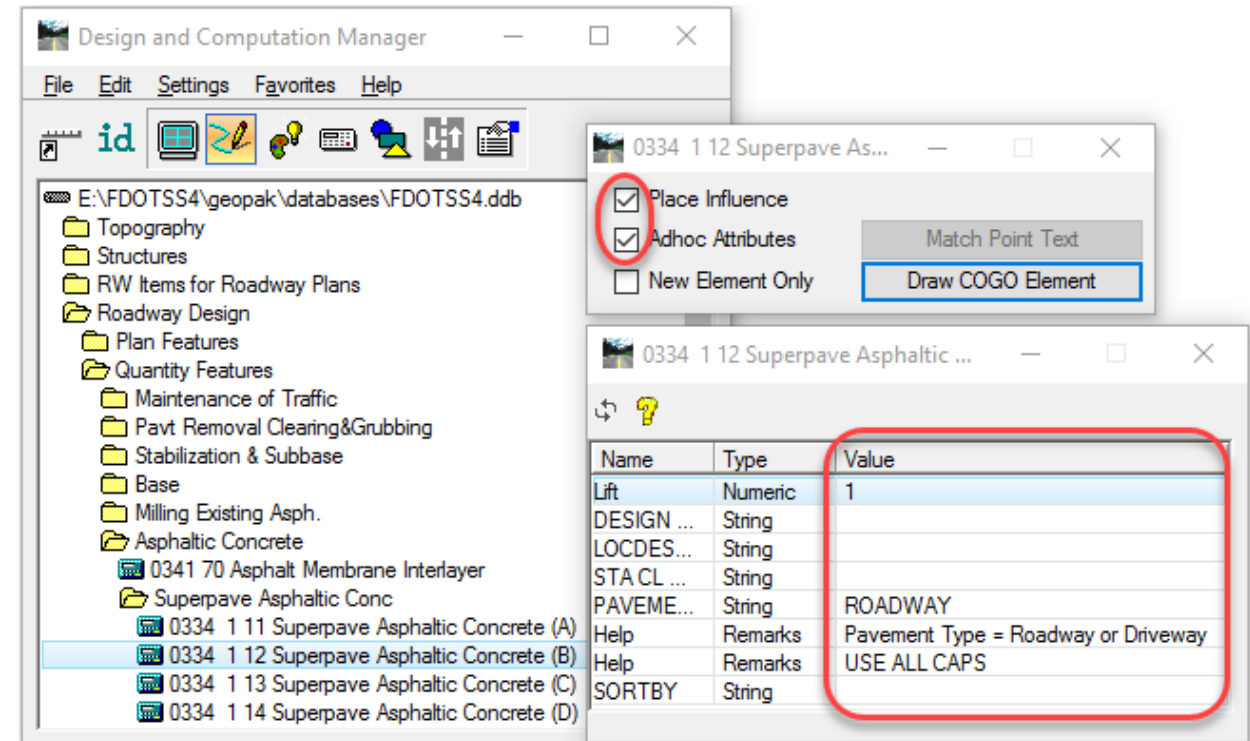
1. In the Default model, attach all the reference files that may be needed for calculations.
2. Copy the pre-referenced Default model to create new models for each individual quantity/pay item.



# Area Quantities

Use the Create Region tool (recommended) to create area shapes with Place Influence from the D&C Manager

- D&C Manager Shape tool does NOT “play well” with Civil Elements.
- Make sure the setting for Associative Region Boundary is NOT checked.
- Adjust the Adhoc Values before creating the shapes.

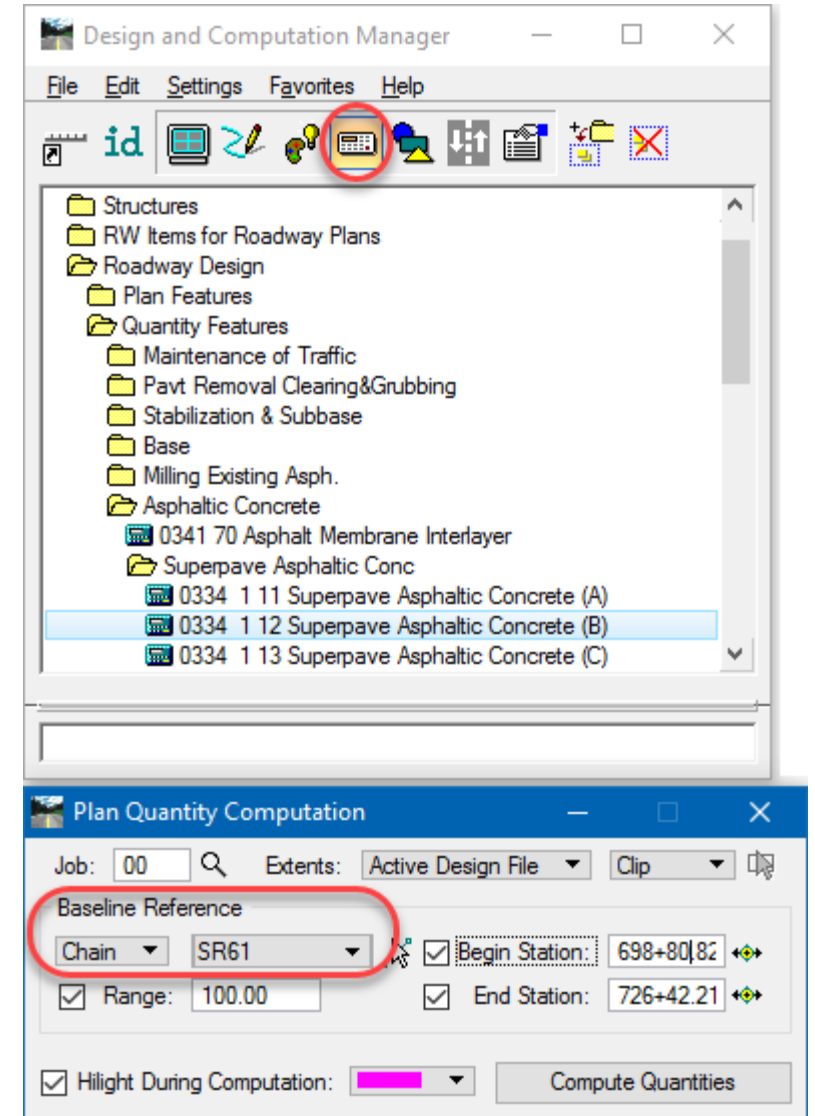




# Calculate Quantities

## Use the D&C Manager – Compute Mode

- Calculate by single item, Category, or Collection Set
- Make sure to use the option for Chain
  - Automated quantities must have a station associated with the quantity for LDM to include in the summary box.



# Export Quantities

To export to Quantity Manager the Export Format needs to be set to DBMS

- Computation Results dialog allows the option to Export the quantities in multiple formats.

Make sure to modify the Groupings to the correct AASHTOWare Project Preconstruction category. (See BOE Chapter 9)

Computation Results

| Item      | Description                      | Quantity  | Unit | Export                              |
|-----------|----------------------------------|-----------|------|-------------------------------------|
| 0334 1 12 | Superpave Asphaltic Concrete (B) | 1012.6500 | TN   | <input checked="" type="checkbox"/> |

Export Format: **DBMS** ay\22049555201.mdb Create Export ☐

Run: Groupings **0200** Display

Items are categorized by pay item range:

| Item Numbers (Specification Sections) | SUBJECT/GROUP                                     | Category Design Group/ Plans     |
|---------------------------------------|---|----------------------------------|
| 100-102                               | MOT   | 0200 Roadway                     |
| 103                                   | Temporary Structures                              |                                  |
| 104                                   | Erosion Control Drainage Environmental            |                                  |
| 106-108                               | Environmental                                     |                                  |
|                                       | Coordinator                                       |                                  |
|                                       | Water/Erosion Control                             |                                  |
|                                       | Air Quality                                       |                                  |
| 109                                   | Field Office                                      | 0100 Structures or 0200 Roadway  |
|                                       | "Dirt" Earthwork                                  |                                  |
|                                       | Roadway   |                                  |
|                                       | Erosion Control                                   |                                  |
| 200-299                               | Base Courses                                      | 0100 Structures                  |
| 300-399                               | Surface Courses, Concrete Pavement                |                                  |
| except 346-347                        | Concrete  | 0200 Roadway                     |
| 400-499                               | Structures  | 0100 Structures                  |
| except 425-449                        | Drainage Structures                               | 0200 Roadway                     |
| 500-515                               | Incidental Construction- Structures               | 0100 Structures                  |
| 516-559                               | Incidental Construction- Roadway Items            | 0200 Roadway                     |
| 560-569                               | Incidental Construction- Structural Paint         | 0100 Structures                  |
| 570-599                               | Incidental Construction- Turf & Landscaping       | 0200 Roadway or 0600 Landscaping |
| 600-699                               | Traffic Control Devices (Signals & ITS)           | 0500 Signals                     |
|                                       | Conduit and other "common use" items              | Other categories, as needed      |
| 700-714                               | Traffic Control                                   | 0300 Signing                     |
| 715                                   | Traffic Control- Lighting                         | 0400 Lighting                    |
| 720-740                               | Incidental Construction- Other                    | 0200 Roadway                     |
| 741-749                               | Incidental Construction- Traffic Monitoring (TMS) |                                  |
| 750-770                               | Incidental Construction- Other                    |                                  |
| 780-789                               | Intelligent Transportation Systems (ITS)          | 0550 ITS                         |
| 800-899                               | Mass Transit (Railroad)                           | 0900 Mass Transit                |
| 1000-1999                             | Utilities   | 0100 Structures                  |

NOTE: While pay item ranges are generally grouped by category, some items may be used in multiple categories. Refer to the specific items for details.

**Category 550 ITS:** This category may be used through June 2018 lettings. All projects with ITS components let July 2017 or later should include the ITS work in the signalization plans. Additional information will be posted in the 2018 Design Manual (PPM replacement) in November 2017.

# Label Area IDs

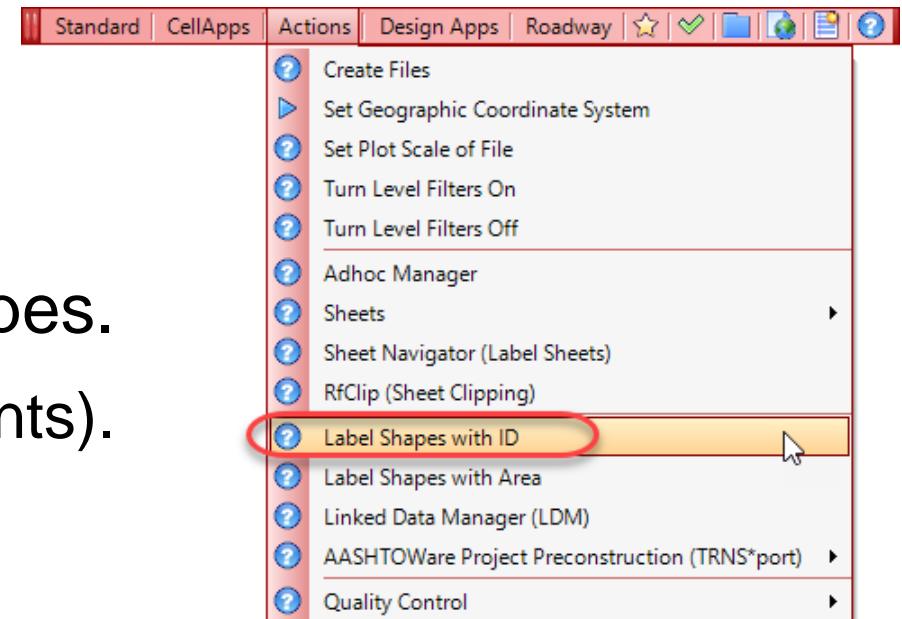
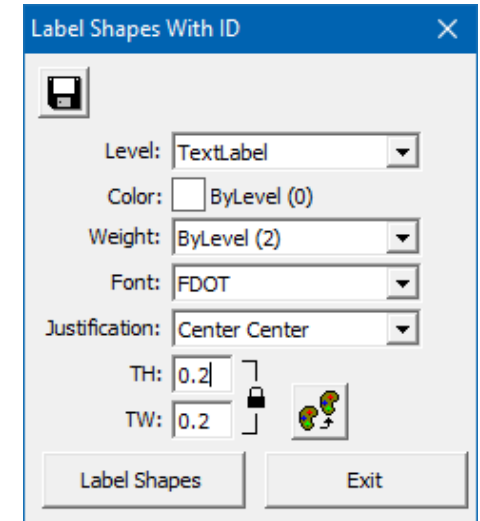
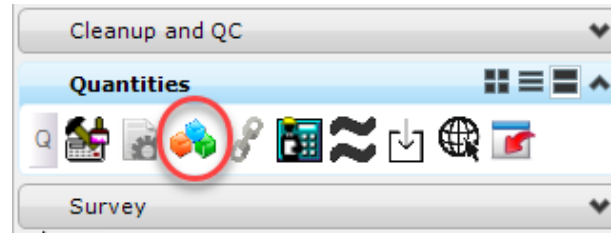
Labeling Area IDs is REQUIRED.

Use the VBA to label these areas.

- Found on the FDOT Plans Development > Quantities Task Menu
- **OR** on the FDOT Menu under Actions > Label Shapes with ID

Create a selection set & then click Label Shapes.

- Only labels shapes (you can select ALL elements).

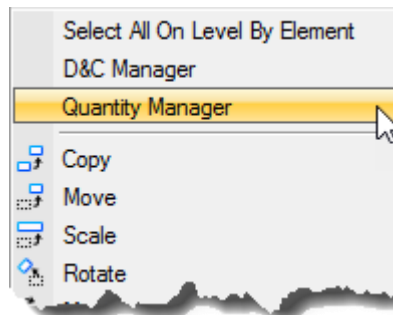


# Quantity Manager

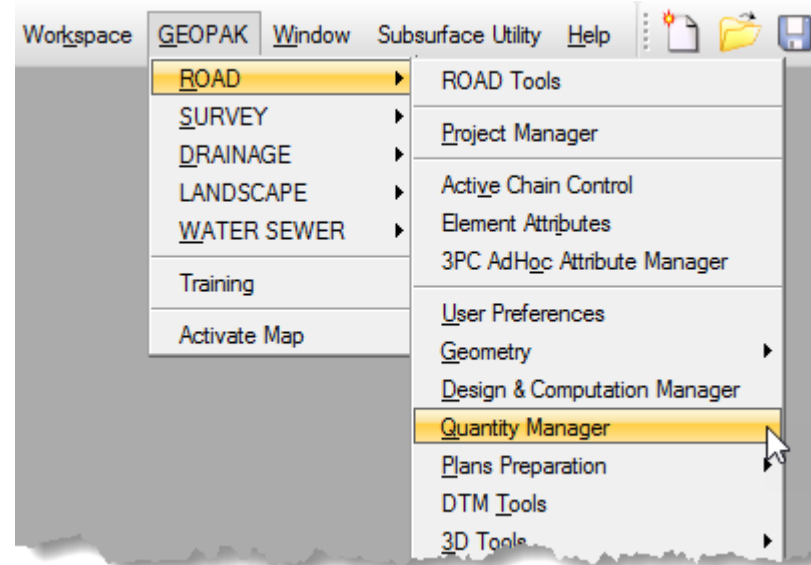
Quantity Manager is a GEOPAK application used to manage quantities.

Access Options:

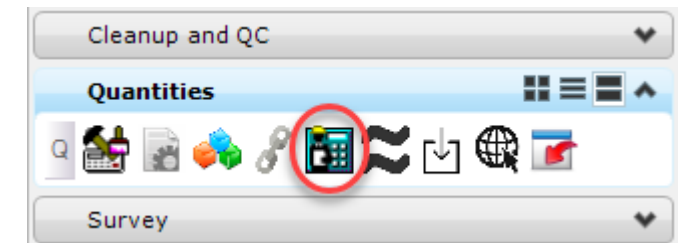
Right click in the MicroStation window and select Quantity Manager from the context pop up menu



Select GEOPAK > ROAD > Quantity Manager from the MicroStation menu



Select the Quantity Manager icon on the FDOT Plans Development > Quantities Task Menu



# Quantity Manager

The screenshot displays the Quantity Manager application window. The interface is divided into several panes:

- Pay Item Tree:** Located on the left, it shows a hierarchical tree structure of project items. The item "0334 1 12 Superpave Asphaltic Concrete" is selected and highlighted in blue.
- Pay Item Table:** Located in the center, it displays a table of project items. The table has columns: Category, Payitem, Trns\*port..., Chain, Net Value, Remarks, Description, and Ext. The row for "0334 1 12 Superpave Asphaltic Concrete" is highlighted in blue.
- Quantity Pane:** A red box highlights the "Quantity Pane" label, which is positioned over the "Pay Item Table".
- Element Pane:** A red box highlights the "Element Pane" label, which is positioned over the "Element Pane" section at the bottom of the window.
- Pay Item Pane:** A red box highlights the "Pay Item Pane" label, which is positioned over the "Pay Item Tree".

The "Pay Item Table" contains the following data:

| Category       | Payitem   | Trns*port... | Chain | Net Value | Remarks | Description | Ext |
|----------------|-----------|--------------|-------|-----------|---------|-------------|-----|
| root/Roadwa... | 0334 1 12 | 0200         | SR61  | 14.330    |         |             |     |
| root/Roadwa... | 0334 1 12 | 0200         | SR61  | 25.890    |         |             |     |
| root/Roadwa... | 0334 1 12 | 0200         | SR61  | 14.400    |         |             |     |
| root/Roadwa... | 0334 1 12 | 0200         | SR61  | 22.290    |         |             |     |
| root/Roadwa... | 0334 1 12 | 0200         | SR61  | 0.340     |         |             |     |
| root/Roadwa... | 0334 1 12 | 0200         | SR61  | 8.170     |         |             |     |
| root/Roadwa... | 0334 1 12 | 0200         | SR61  | 22.650    |         |             |     |
| root/Roadwa... | 0334 1 12 | 0200         | SR61  | 0.100     |         |             |     |
| root/Roadwa... | 0334 1 12 | 0200         | SR61  | 2.600     |         |             |     |
| root/Roadwa... | 0334 1 12 | 0200         | SR61  | 32.670    |         |             |     |

The "Element Pane" at the bottom displays the following data:

| Name          | Type        | Radius | Delta | Length  | Direction | Native Id | Docu    |
|---------------|-------------|--------|-------|---------|-----------|-----------|---------|
| 17156 (Com... | Line        |        |       | 100.000 | 239.991   | 17156     | C:\e\pr |
| 17156 (Com... | Line        |        |       | 68.436  | 329.991   | 17156     | C:\e\pr |
| 17156 (Com... | Line        |        |       | 20.290  | 59.973    | 17156     | C:\e\pr |
| 17156 (Com... | Line String |        |       | 52.545  |           | 17156     | C:\e\pr |
| 17156 (Com... | Line        |        |       | 5.857   | 80.127    | 17156     | C:\e\pr |
| 17156 (Com... | Line String |        |       |         |           | 17156     | C:\e\pr |
| 17156 (Com... | Line        |        |       |         | 8.991     | 17156     | C:\e\pr |

- Right click on the Quantity or Element Pane headers to change the column options.
- Right click in the Pay Item Pane for context sensitive menu options to add, edit and delete categories, items and quantities

# Quantity Manager

New Quantity Properties dialog boxes:

New Quantity Properties - For Payitem: 0334 1 52

General Location Adhoc Attributes

Measurement Basis: Each

Measurement Value: 0.000

Computed Quantity: 0.000

Rounded Quantity: 0.000

Deduction Quantity: 0.000

Net Quantity: 0.000

Boundary Type: None

Boundary Name: Boundary

Run Name:

Trns\*port Groupings: 0200

Date / Time: 2017-05-10 13:12:28

Remarks:

Description:

Extended Description:

Create Close

New Quantity Properties - For Payitem: 0334 1 52

General Location Adhoc Attributes

Baseline Chain:

Minimum Station

Station: Region:

Offset:

Maximum Station

Station: Region:

Offset:

Create Close

**VERY IMPORTANT!  
INCLUDE CHAIN AND  
STATION INFORMATION  
FOR AUTOMATION**

Edit Quantity Properties - Payitem: 0334 1 52- Computed Quantity: 0.0

General Location Adhoc Attributes

| Name  | Type   | Value | Source | Dirty                    |
|-------|--------|-------|--------|--------------------------|
| New 1 | String |       | Manual | <input type="checkbox"/> |

Update Close

# Questions?

Thank you for joining today's session!

Need HELP? Contact me...

(850) 414-4289

E-mail: [Kandi.Daffin@dot.state.fl.us](mailto:Kandi.Daffin@dot.state.fl.us)

OR: [CADD.Support@dot.state.fl.us](mailto:CADD.Support@dot.state.fl.us)

<http://www.fdot.gov/cadd/>

FDOT CADD Support Forum On-line

[https://communities.bentley.com/communities/user\\_communities/fdot\\_cadd\\_support/](https://communities.bentley.com/communities/user_communities/fdot_cadd_support/)