# **11** QUANTITIES AND REPORTS

# **O**BJECTIVE

In this chapter the CADD Quantity Workflow will be covered. Topics include:

- Generate Quantities and Export to Quantity Manager
- Quantity Manager Overview
- Create Tabulation of Quantities Sheet using Linked Data Manager (LDM)

## INTRODUCTION

This chapter covers applications used to generate and document quantities in the plans. This workflow includes calculating the quantities using the D&C Manager, exporting the quantities to Quantity Manager, and using Linked Data Manager (LDM) to create the Tabulation of Quantities sheet using the Quantity Manager database.

The workflow to export quantities from Quantity Manager to Designer Interface for AASHTOWare Project Preconstruction and create the Summary of Pay Items sheet is documented in the FDOT Automated Quantities training manual.

## **GENERATE QUANTITIES**

Quantities can be generated from the elements drawn in MicroStation using D&C Manager or tagged with the GEOPAK attribute. The GEOPAK Draw Cell by Feature tools and the Open Roads Civil Tools use the D&C Manager database in the background to set and tag the elements being drawn. Quantities may also be generated manually or using other software.

Traffic Plans components use **Tabulation of Quantities** sheets to document quantities. **D&C Manager** has the ability to generate individual sheet quantities using the clip borders created using the Plan/Profile Sheet Composition tool.

*Note* In order to use this method, the clip borders must be in the active file. It is recommended to calculate the quantities in the CLIPXX file with the DSGNXX file referenced.

## **D&C MANAGER COMPUTE MODE**

The Compute mode tabulates quantities of items placed as Pay Items by the D&C Manager. When the *Compute* option is selected, **D&C Manager** expands to add a list box at the bottom of the dialog. This is the *Collection* bin. Using this bin is optional. Quantities may also be calculated with a single item or category selected. To load items into the collection bin double click on the item or right click and select *Add to Collection*. Categories can be added by right clicking and selecting *Add to Collection*. To clear the collection bin, right click in the collection bin area and select *Clear Collection*. Once all of the items are added to the collection bin, the list can be saved for

future use. To save a collection right click in the collection bin area and select Save Collection. Save the file to the project discipline directory.

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Thermoplastic	<u>C</u> ollapse All			
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## **COMPUTING QUANTITIES**

Plan Quantity Computation opens when the Compute is selected.

Flan Quantity Computation —		×
Job: Q Extents: Active Design File 🔻	Inside	• 🕸
Baseline Reference		
Chain 🔻 <none> 💌 🛵 🗹 Begin Station:</none>		+ <del>0</del> +
Range: 100.00 End Station:		++++
Hilight During Computation: Comp	oute Quari	tities

- Job
- COGO database for the project used for chain information (GEOPAK gpk file)
- Extents

List of options for limiting the area and elements included in the quantity calculations.

Plan Quantity Computation	_		
Job: Q Extents: >> Baseline Reference Chain  Range: 100.00	Active Design File View Fence Boundary Element Station Range	ide ▼ ↓\$	
Hilight During Computation:	Sheet Range Selection Set Boundary Selection Set	Quantities	

- Active Design File All elements in the Active Design File are candidates for computation. 0
- View Only the selected items that are displayed in MicroStation view one are computed. 0

- *Fence* A MicroStation fence must be placed, and all specified graphical features, which satisfy both the fence and the Range, will be tabulated.
- Boundary Element A previously drawn closed shape is used to determine quantities. When selected, you are prompted to select the closed shape. This mode is sensitive to the MicroStation Inside, Overlap and Clip modes.
- Station Range A Baseline Reference (chain or dgn) must be defined for this option. The range fields default to the extent of the chain. Key-in a station or by clicking Begin or End Station icons, graphically define the station range. Perpendicular projections to the station(s) define the extent of the computations. This option is not ideal for sheet quantities.
- *Sheet Range* Sheets (clip borders) placed with the Plan/Profile Sheet Composition tool are used to define the area of computation.
- Selection Set A MicroStation selection set is defined to set the elements to be computed.
- **Boundary Selection Set** A MicroStation selection set of the Boundary (not the actual candidate compute elements) must be created prior to computing.
- **Baseline Reference** allows the designer to define a *Chain* or *DGN Element* for offsets and station values for reports. In addition the *Range*, if set, is measured from the selected *Chain* or *DGN Element* to search for candidate items. Setting the *Baseline Reference* to **None** limits the type of output that can be generated as no station / offset values can be computed.
- **Highlight During Computation**, when selected, all MicroStation elements computed are highlighted in the selected highlight color.
- Compute Quantities starts the computation process and when completed opens the Computation Results dialog.

ltem	Description	Quantity	Unit	Export	1
0711 15101	Thermo., Std Open Grade, White, Sol	1.3506	GM	2	
0710 11101	Paint, Std., White, Solid, 6"	1.3506	GM	<ul><li>✓</li></ul>	
0711 15102	Thermo., Std Open Grade, White, Sol	0.1779	GM		
0710 11102	Paint, Std., White, Solid, 8"	0.1779	GM		
0711 11125	Thermo., Std., White, Solid, Stop Line, 24'	211.8000	LF		
0710 11125	Paint, White, Solid, Sto / Crosswalk, 24"	211.8000	LF		
0711 15201	Thermo., Std Open Grade, Yellow, Sol	0.6274	GM		
0710 11201	Paint, Std., Yellow, Solid, 6"	0.6274	GM		
0711 11141	Thermo., Std., White, Guide Line, 6" (2/4)	0.0225	GM		
0710 11141	Paint, Std., White, Guide Line, 6" (2/4)	0.0225	GM		
0711 11124	Thermo., Std., White, Sol/Chevrons, 18'	158.0000	LF		
1710 11124	Daint Ctd Mibita Calid /Chauron 10"	150 0000	10	89	



- *Export Format* sets the type of output the designer wants to generate from the reported quantities. There are several formats:
  - <u>Comp Book</u> A more detailed report that lists not only quantity summaries, but also geometric
    properties such as plan view coordinates and station/offsets for located elements. File is in
    ASCII format.
  - <u>Item Report</u> Quantities Summary listing pay items, descriptions, units and total quantities for located elements. File is in ASCII format.

- <u>Item Table Contains the same information as the Item Report, but formatted in tabular form.</u>
- <u>DBMS</u> Very detailed information including calculated and rounded quantities, geometric properties, pay item numbers, descriptions, station / offset values, etc. The format is the selected database (i.e., Microsoft Access, Oracle, SQL Server) defined in the Compute Settings. This option is required when taking the quantities into Quantity Manager.
- <u>CSV By Item</u>–Summary listing pay items, descriptions, units and total quantities for located elements. Format is CSV (coma separated values).
- <u>CSV By Element</u> A more detailed report that lists not only quantity summaries, but also geometric properties such as plan view coordinates and station/offsets for located elements. Format is CSV (coma separated values).
- <u>Table</u> User defined table column properties. A column for designating the appropriate symbol is also included, as well as Adhoc attribute data. This option is used to generate legends such as for landscape plans.
- *File Name* field next to the Export Format is the output file. Using the hourglass allows the designer to browse to a specific folder.
- *Create or Append* are the two export options for the quantities. This will place the quantities into a new file or append them to a previously created file.
- o Run and Groupings are only used for the DBMS export format to Quantity Manager.
  - <u>Run</u> is a user key-in and any logical description, like Pavement Marking or Preliminary, can be used. This description will be passed to Quantity Manager.
  - <u>Groupings</u> Value to define the TRNSPORT Grouping in Quantity Manager.
- *Export* commences the output file process and creates the quantity file. In this training, you will be exporting to DBMS, which will create an MDB file that can then be opened with Quantity Manager.

### **Exercise 11.1** Generate Quantities and Export to Quantity Manager

#### > Create a Collection (Part 1)

In this part of the exercise the student will create a collection of items used to generate.

- 1. If closed, open *CLIPSP01.dgn* in the *Signing* folder.
- 2. Open D&C Manager and click the Compute icon. (This is the Calculator icon).

- 3. Next, select the *Thermoplastic category*, right click and select Add to Collection.
- 4. Double click on the item Pavement Markings > Paint, Standard > Island Nose > 0710 11290 Paint, Std., Yellow, Island Nose to add the item to the collection.
- 5. Double click on the item Pavement Markings > Pavement Markers > 0706 3 Retro-Reflective Pavement Marker to add the item to the collection.



- > Use the Display Tool to Review the Quantity Items (Part 2)
  - 1. Click the **Display** tool on **D&C Manager**.



- 2. On the *Display* tool, click the **Highlight** icon. (This will highlight all of the items in the collection.)
- 3. Take a moment to review the design file.

*Hint* It may be helpful to turn off all of the reference files except for the DSGNSP01.dgn in order to more clearly identify any elements not being highlighted.

- 4. Set the *Display Option* to **Normal**.
- 5. Close the **Display** tool.

*Note* If there are items in the collection bin of D&C Manager, right click in the collection area and select Clear Collection.

#### > Compute quantities (Part 3)

1. On D&C Manager dialog, click the Compute icon. (This opens Plan Quantity Computation.)

Flan Quantity Computation —	
Job: 61 Q Extents: Active Design File 🔻	Inside 🔻 🕼
Baseline Reference	
Chain 🔻 CLCON 💌 🎎 🗌 Begin Station:	700+00.00 ++++
Range: 200.00 End Station:	700+00.00 ++++++++++++++++++++++++++++++
Hilight During Computation: Comp	oute Quantities

- 2. The *Job* number is **61**.
- 3. Set the *Extents* to **Sheet Range**.
- 4. Set to *Method* to Clip.
- 5. Toggle **On** Highlight During Computation.
- 6. Click Identify a Plan Sheet Clip Boundary button next to the *Extents* drop down menu.

	🚔 Plan Quantity Computation — 🗆 🔀
	Job: 61 🔍 Extents: Sheet Range 🔻 Clip 📢
1	Sheet Reference
	Chain  CLCON  Begin Sheet: 01  Identify a Plan Sheet Clip Boundary
	Scale: 50.00 End Sheet: 04
	Hilight During Computation: Compute Quantities

- 7. Select the first sheet **Clip Border** on the *SR61 alignment*.
- 8. For the *End Sheet*, select Sheet 04/Sequence 4 from the drop down list.
- 9. Click Compute Quantities. This opens Computation Results dialog.

em	Description	Quantity	Unit	Export
711 14125	Thermo, Preformed, White, Solid, 24"	239.6000	LF	
706 3	Retro-Reflective Pavement Marker	390.0000	EA	~
711 15101	Thermo., Std Open Grade, White, Sol	1.2484	GM	~
710 11101	Paint, Std., White, Solid, 6"	1.2484	GM	~
711 15102	Thermo., Std Open Grade, White, Sol	0.1778	GM	~
710 11102	Paint, Std., White, Solid, 8"	0.1778	GM	~
711 11125	Thermo., Std., White, Solid, Stop Line, 24'	134.6000	LF	~
710 11125	Paint, White, Solid, Sto/Crosswalk, 24"	134.6000	LF	~
711 15201	Thermo., Std Open Grade, Yellow, Sol	1.0578	GM	~
710 11201	Paint, Std., Yellow, Solid, 6"	1.0578	GM	~
711 11141	Thermo., Std., White, Guide Line, 6" (2/4)	0.0940	GM	~
710 11141	Paint, Std., White, Guide Line, 6" (2/4)	0.0940	GM	~
711 11124	Thermo., Std., White, Sol/Chevrons, 18'	339.0000	LF	~
710 11124	Paint, Std., White, Solid,/Chevron, 18"	339.0000	LF	~
711 11123	Thermo., Std., White, Solid, C/RA, 12"	294.1000	LF	~
710 11123	Paint, Std., White, Solid, Cross/RA, 12"	294.1000	LF	<b>v</b>
711 11224	Thermo., Std., Yellow, So/Chevrons, 18	321.9000	LF	<b>V</b>
710 11224	Paint, Std., Yellow, Soli.,./Chevrons, 18"	321,9000	LF	~
711 15131	Thermo., Std OG, White, Skip, 6"/30)	0.5016	GM	~
710 11131	Paint, Std., White, Skip, 6" (10/30)	0.5016	GM	<b>V</b>
711 11170	Thermo., Std., Arrows (Left)	4.0000	EA	2
710 11170	Paint, Std., Arrows (Left)	4.0000	EA	<b>V</b>
711 11170	Thermo., Std., Arrows (Right)	6.0000	EA	V
710 11170	Paint, Std., Arrows (Right)	6.0000	EA	V
711 11160	Thermo., Std., Message or Symbol (ONLY)	4.0000	EA	V
710 11160	Paint, Std., Message or Symbol (ONLY)	4.0000	EA	V
711 11160	Thermo., Std., Message or Symbol (ME	2.0000	EA	V
710 11160	Paint, Std., Message or Symbol (MERGE)	2.0000	EA	V
711 11170	Thermo., Std., Arrows (Merge)	2.0000	EA	~
710 11170	Paint, Std., Arrows (Merge)	2.0000	EA	<b>V</b>
711 11141	Thermo., Std., White, Dotted Ext., 6/10)	0.0525	GM	<b>V</b>
710 11141	Paint, Std., White, Dotted Ext., 6" (6/10)	0.0525	GM	<b>V</b>
711 14170	Thermo., Preformed, Arrows (Bike Thru)	10.0000	EA	<b>V</b>
711 14160	Thermo., Preformed, Message or Symbo	10.0000	EA	<b>V</b>
710 11290	Paint, Std., Yellow, Island Nose	113.8000	SF	<b>V</b>
711 11170	Thermoplastic, Arrows	8.0000	EA	<b>V</b>
711 11241	Thermo., Std., Yellow, Dotted Ext.,/10)	0.0966	GM	<b>V</b>
710 11241	Paint, Std., Yellow, Dotted Ext., 6" (6/10)	0.0966	GM	<b>V</b>
port Format: [	DBMS  22049555201.mdb	Q. Create	•	Export 🔲 🗐

#### > Export Quantities to DBMS for Quantity Manager (Part 4)

- 10. Set the Export Format to DBMS. (This is the required format for Quantity Manager.)
- 11. Enter the file name **22049555201** (It's recommend to use the fin number. The MDB file extension will be added automatically.)
- 12. Set to Create. (The options are *Create* or *Append*.)
- 13. For Run, enter Signing and Pavement Markings. (Optional)
- 14. For Groupings, type in 0300.
- 15. Click Export. (This creates the MDB file.)
- 16. Close Computation Results dialog.

#### > Add Signing Quantities to Quantity Manager (Part 5)

17. On the D&C Manager dialog, right click inside the Collection bin and select Clear Collection.

0706 3 Retro-Reflective Pavi 0710 11290 Paint, Std., Yellor Thermoplastic	<u>Q</u> pen a Collection Save Collection As

- 18. Select the Signing category.
- 19. On the Plan Quantity Computation dialog click Compute Quantities.
- 20. On the Computation Results dialog, change the Create option to Append.
- 21. Click Export.

## **QUANTITY MANAGER**

Quantity Manager is the GEOPAK tool used to store, organize, and manipulate quantities generated by the D&C Manager. Pay items and quantities can also be stored in the database manually. Once the information is loaded into Quantity Manager, the designer can then export the data from Quantity Manager in a format that can be imported into Designer Interface. Linked Data Manager uses the Quantity Manager database to automate the creation of the Tabulation of Quantities Sheets. It is not the intent of this chapter is to provide full training on all of the functions within Quantity Manager. For more in depth information, see the Bentley Help files.

Quantity Manager can be loaded from the Road toolbox, from the MicroStation menu, select **GEOPAK > ROAD** > **Quantity Manager**, or from the *FDOT Plans Development > Quantities* Task menu, select the **Quantity Manager** icon.

## **QUANTITY MANAGER DIALOG**

Quantity Manager has three parts, as shown in the following figure: *Menu bar, Tool Bar* and *Window Area*. The Window area has three panes: *Pay Item, Quantity,* and *Element*.

Quantity Manager - C:\e\projects\22049555201\sig	ning\22049555	201.mdb					_		×
					TO				
	Trns*port	Groupings : 7	ALL TRNS*PC	RT GR 🗸		UL BAR	C		
Payitem Tree Payitem Table	Category	Payitem	Trns*port	Chain	Net Value	Remarks	Description	Extende	d
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Pavement Markings	root\Paveme	. 0711 15101	0300	CLCON	0.025	i			
	root\Paveme	. 0711 15101	0300	CLCON	0.025	i			
	root\Paveme	0711 15101	0300	CLCON	0.029	1			
	root\Paveme	. 0711 15101	0300	CLCON	0.004				
0711 14125 Thermo Prefor	root\Paveme	. 0711 15101	0300	CLCON	0.057	•			
	root\Paveme	0711 15101	0300	CLCON	0.054				
0711 14170 Thermo Prefor	root\Paveme	0711 15101	0300	CLCON	0.049		QUANTITY		
Service and Symbols	root\Paveme	. 0711 15101	0300	CLCON	0.072	:	PANE		
0711 14160 Thermo Prefor	root\Paveme	. 0711 15101	0300	CLCON	0.019	1	1744		
Standard	root\Paveme	. 0711 15101	0300	CLCON	0.007			_	
	root\Paveme	. 0711 15101	0300	CLCON	0.115	i			
i 🔤 Sond	root\Paveme	. 0711 15101	0300	CLCON	0.008	:			
Onen Graded Asnhalt	root\Paveme	0711 15101	0300	CLCON	0.031				
	root\Paveme	0711 15101	0300	CLCON	0.008	:			_
PAYILEM 0710 11101 Point St	root\Paveme	0711 15101	0300	CLCON	0.017	•			_
PANE 0711 15102 Thorma	root\Paveme	. 0711 15101	0300	CLCON	0.104				_
	root\Paveme	0711 15101	0300	CLCON	0.138	•			
0711 15201 Thormo	root\Paveme	0711 15101	0300	CLCON	0.072	:			~
071113201 Menho.	<			i	1	1	i		>
		-							
🔤 0711 11125 Thermo., Sti	📘 💆 Elemei	nts 🔇 Adho	c Attributes	🦆 Payer Parti	cipation 🏾 🍤 F	Funding Pa	articipation 🛛 🤀 A	unding R	ules
🔤 0710 11125 Paint, White	Name	Type	Radius	Delta	Lenath	Direction	Native Id	Docume	ent
🔤 0711 11124 Thermo., Sti		1.916.5	1	1	13	1	1		
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## PAY ITEM PANE

- <u>Payitem Tree</u> This tab displays the contents in a hierarchical structure easily navigated in the same manner as D&C Manager.
- <u>Payitem Table</u> This tab displays the database Pay Items in a table format that contains additional information about Pay Items and is useful for selecting multiple items.

<sup>&</sup>lt;u>The Pay Item Pane is located on the left side of Quantity Manager in Normal View and is the top pane when</u> <u>tiled horizontally. Two tabs control the display type for the Pay Item pane:</u>

## QUANTITY PANE

The Quantity Pane displays only quantity information under the current Phase selected on the tool bar about the specifically selected Pay Item or Category. The information is customizable by selecting which columns to display and sorts by clicking on any of the column headers.

## ELEMENT PANE

The Element Pane displays information specific to the selected Quantity. Each tab displays different attributes. The Elements tab shows all the elements that make up that Quantity. Adhoc Attributes tab displays any Adhoc related to the Quantity. Funding Participation, Funding Rules, and Payer Participation tab displays information related to funding sources.

#### **Exercise 11.2** Navigating Quantity Manager

In this exercise, Quantity Manager will be opened using the previously created database to review the items.

#### > Opening a Project

- 1. From the MicroStation Menu, select Applications > GEOPAK Road > Quantity Manager.
- 2. From the Quantity Manager Menu, select Project > Open. Connect to Database dialog displays.

Connect To Database						
File:	ning\22049555201.mdb	۹				
User Name:						
Password:						
	Connect					

3. In the *File* box, enter the path to the database, 22049555201.mdb

<OR> click the Select Database Filename icon and navigate to the file.

- 4. Leave the User Name and Password boxes blank.
- 5. Click the **Connect** button. The database displays.
- 6. From Quantity Manager, select the Pay Item Tree tab.
- 7. Navigate through the database and select *Pay Item* 0711 15101.



- 8. In the *Quantity Pane*, select one of the quantity rows.
- 9. In the *Elements Pane*, select the **Elements** tab and review the components of the selected quantity.



10. In the *Element Pane*, select the Adhoc Attributes tab. The Adhoc tags display for this element.



11. Close Quantity Manager.

## LINKED DATA MANAGER BASICS

Access LDM through the FDOT Menu to create a link between Excel spreadsheet files and the MicroStation design (DGN) file for easy placement and updating of Summary Boxes. The LDM link provides easy access to the Excel spreadsheet for modification and update with a simple right-click on the link.

Access LDM from the FDOT Menu by selecting Actions > Linked Data Manager.

<OR>

From the *FDOT Plans Development* > *Quantities* Tasks menu, select the **Linked Data Manager** icon.

<OR>

Select Linked Data Manager from the Right Click Context Menu. (if available)

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				Set	Set Geographic Coordinate System				
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			0	She	et Navigator (La	bel Sheets)			
			0	RfC	lip (Sheet Clippir	ng)			
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			0	Linked Data Manager (LDM)					
			0	AAS	HTOWare Proje	ct Preconstruct	ion (TRNS*port)	•	
			0	Qua	lity Control			•	

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ID	Source Path	Description	Туре	Update	Locked
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*Note* For more in-depth information on the features of this tool, refer to the LDM Help file or Posted Webinars.

LDM provides an automated option (*Create New from Quantities*) to create FDOT Summary Boxes and Tabulation of Quantities sheets that only need to be run once to generate an Excel template file from Quantity Manager with all worksheets created and contained in a single file.

	Link Informati	on
Source File Source Path Description	Create New from Template Create New	w from Quantities
	Quantity Mana	ger Summary Reports
- F	Quantity Manager Database:	
	Porce all text Imp	File Name
Graphics :	Summary of Barrier Walls	Summary_of_Barrier_Walls
FDOT	Summary of Ditch Pavement Summary of Ditch Pavement	Summary_of_Ditch_Pavem Summary_of_Ditch_Pavem
<ul> <li>Site</li> <li>Project</li> </ul>	Summary of Edgedrain Summary of Erosion Control	Summary_of_Edgedrain Summary_of_Erosion_Control
	Summary of Fencing Summary of French Drain	Summary_of_Fencing Summary_of_French_Drain
	Summary of Guardrail Summary of Mailboxes	Summary_of_Guardrail_Ex Summary_of_Mailboxes
	Summary of Miscellaneous Asphalt Summary of Pavement	Summary_of_Misc_Asphalt Summary_of_Pavement
	Summary of Permanent Crash Cushions Summary of Railing	Summary_of_Permanent_C Summary_of_Railing_Expa
	Summary of Sidewalk	Summary of Sidewalk
	ОК	Cancel

#### **Exercise 11.3** Create Tabulation of Quantities Sheet from Quantities

- 1. Continuing in the MicroStation file *CLIPSP01.dgn*, on the FDOT Menu, select Actions > Create File/Project.
- 2. Set the *File Group* to Signing & Pavement Marking Files (DGN), on the *File Type* list, select Tabulation of Quantities Sheets and click Create.

🔰 Create File/								
	Project	-		$\times$				
Project:	C:\e\projects\22049555201	~	Project Sett	ings				
Workspace:	FD0TSS4	~						
Control File:	ROADWAY.CTL	~	<b>A</b> 14					
File Group:	Signing & Pavement Marking Files (DGN)	~	<b>80</b>					
File Tupe:	ile Tune:							
BORDER FOR BORDER FOR CLIP BORDEF DIGITAL SIGN GENERAL NO GUIDE SIGN V KEY SHEET LAYOUT AS A MAST ARM DI MOTIF FILE FI MOTIF FILE FI PLAN SHEET PROPOSED D ROADWAY CF SPECIAL DET. SPECIAL SIGN SUMMARY OF TABULATION TFXT LABELS	ERENC	ED	~					
Output File:	TABQSP01							
Output File: Output Folder:	TABQSP01 Signing\		Browse					
Output File: Output Folder: Seed File:	TABQSP01 Signing\ fdotseed2d.dgn		Browse					
Output File: Output Folder: Seed File: Seed Path:	TABQSP01 Signing\ fdotseed2d.dgn resources/seed/		Browse Browse					
Output File: Output Folder: Seed File: Seed Path: Action:	TABQSP01 Signing\ fdotseed2d.dgn resources/seed/ mdllplotscale.plotscale.set		Browse Browse Apply Acti	on				

- 3. Click **OK** confirming that the file successfully created.
- 4. Select **Open File** to open the new file.
- 5. Upon opening, click **OK** on the **Set Plot Scale** dialog, and then **OK** on the **Create File/Project** dialog to close it.

- Tasks • 4 X Tasks -🐼 FDOT Plans Development \$\$.\$\$.\$P.\X \$\.\$ Typical Sections Key Sheets Roadway Plans **Existing Features** \* Cross Sections \* **Drainage Plans** ~ Traffic Plans × Traffic Control ~ Utilities Cleanup and QC 태르 문 ^ Quantities Q 3 Open Link Data Manager
- 6. From the *FDOT Plans Development* > *Quantities* Tasks menu, select the **Linked Data Manager** icon to open LDM.

7. From LDM, select the Create Link button.

FDC	OT Linked Data Manager 1.01.10		_		$\times$
	🍋 🗶 🕕 🔁 🕹				
ID	Source Path	Description	Туре	Update	Locked
C:\e\pro	jects\22049555201				

8. On the Link Information dialog, select the Create New from Quantities button.

Link Information	
Source File	Create New from Template
Source Path	
Description	

- 9. From the Quantity Manager Summary Reports dialog, click the **Browse** button and select the database file *22049555201.mdb*.
- 10. Check **On** the option to *Force all text imported from database to be UPPER CASE*.
- 11. Select the Tabulation of Quantities report from the list and click OK.

Quantity Manager Database:	.\signing\22049555201.mdb ~										
	Manager Summary Reports Initiv Manager Database: .\signing\22049555201.mdb  Force all text imported from data Description any of Mailboxes any of Mailboxes any of Miscellaneous Asphalt any of Pavement any of Permanent Crash Cushions any of Realing any of Sidewalk any of Temporary Crash Cushions any of Temporary Driveways any of Trench Drain any of Turf and Prepared Soil Layer any of Underdrain any of Utility Adjustments tition of Quantities	atabase to be UPPER CASE									
Report Description		File Name									
Summary of Mailboxes		Summary_of_Mailboxes									
Summary of Miscellaneous Aspha	lt	Summary_of_Misc_Asphalt									
Summary of Pavement		Summary_of_Pavement									
Summary of Permanent Crash Cus	shions	Summary_of_Permanent_C									
Summary of Railing		Summary_of_Railing_Expa									
Summary of Sidewalk		Summary_of_Sidewalk									
Summary of Temporary Crash Cus	hions	Summary_of_Temporary_C									
Summary of Temporary Driveways	3	Summary_of_Temporary_D									
Summary of Trench Drain		Summary_of_Trench_Drain									
Summary of Turf and Prepared So	il Layer	Summary_of_Turf_and_Pre									
Summary of Turnouts		Summary_of_Tumouts_Ex									
Summary of Underdrain		Summary_of_Underdrain_E									
Summary of Utility Adjustments		Summary_of_Utility_Adjust									
Tabulation of Quantities		Tabulation_of_QuantitiesS									

- 12. Save the Excel file to the project discipline sub-directory, Signing.
- 13. On the Link Information dialog, the *Source Path* populates. Complete the dialog as shown below and click **OK**.

Link Information	
Source File	Create New from Template Create New from Quantities
Source Path	.\signing\Tabulation_of_QuantitiesSPM.xlsx 🗸 🔯 🗈 🏢
Description	
Quantity Report	Header Rows 2 Cell Library roadway.cel Cell Offset X 0.0 Table Array X 18 Cell Name shplan Cell Offset Y 9.4
Graphics Se	Standard
O Project	
	Use Drawing Scale 🔽 Update Graphics on File Open 🗌 Lock Graphics 📄 Use Print Area
	OK Cancel

14. Data Point in the design file to place the sheet.

ΡΑΥ	
ITEM DESCR	IPTI
NO.	
0700 1 11 SINGLE POST SIGN FURNISH&INSTALL LESS THAN 12	
0700 1 12 SINGLE POST SIGN, FURNISH & INSTALL, 12-20	
0700 1 74 SINGLE POST SIGN, FURNISH & INSTALL, MORE THAN	
0700 212 MULTI-POST SIGN, FURNISH & INSTALL, 12	
0700 213 MULTI-POST SIGN, FURNISH & INSTALL, 21 TO 30	
0700 2 18 MULTI-POST SIGN, FURNISH & INSTALL, 12	
0706 3 RETRO-REFLECTIVE PAVEMENT MARKER	
0710 11101 PAINT, STD., WHITE, SOLID, 6"	
0710 11102 PAINT, STD., WHITE, SOLID, 8"	
0710 11123 PAINT, STD., WHITE, SOLID, CROSSWALK/RA, 12"	
0710 11124 PAINT, STD., WHITE, SOLID, DIAG./CHEVRON, 18"	
0710_11125_PAINT, WHITE, SOLID, STOP_LINES/CROSSWALK, 24"	
0710 11131 PAINT, STD., WHITE, SKIP, 6" (10/30)	
0710 11141 PAINT, STD., WHITE, DOTTED EXT., 6" (6/10)	
0710 11160 PAINT, STD., MESSAGE OR SYMBOL (MERGE)	
0710 11170 PAINT, STD., ARROWS (MERGE)	
0710 11201 PAINT, STD., YELLOW, SOLID, 6"	
0710 11224 PAINT, STD., YELLOW, SOLID, DIAG/CHEVRONS, 18"	
0710 11241 PAINT, STD., YELLOW, DOTTED EXT., 6" (6/10)	
0710 11290 PAINT, STD., YELLOW, ISLAND NOSE	
0711 11123 THERMO., STD., WHITE, SOLID, CROSSWALK/RA, 12"	
0711 11124 THERMO., STD., WHITE, SOLID, DIAG./CHEVRONS, 18"	
0711 11125 THERMO STD WHITE SOLLD STOP LINE 24"	
0711 11141 THERMO., STD., WHITE, DOTTED EXT., 6" (6/10)	
0711 11160 THERMO., STD., MESSAGE OR SYMBOL (MERGE)	
0711 11170 THERMOPLASTIC, ARROWS	
0711 11224 THERMO., STD., YELLOW, SOLID, DIAG./CHEVRONS, 18"	
0711 11241 THERMO., STD., YELLOW, DOTTED EXT., 6" (6/10)	
0711 14125 THERMO., PREFORMED, WHITE, SOLID, 24"	
0711 14160 THERMO., PREFORMED, MESSAGE OR SYMBOL (BIKE)	
0711 14170 THERMO., PREFORMED, ARROWS (BIKE THRU)	
0711 15101 THERMO., STD OPEN GRADE, WHITE, SOLID, 6"	
0711 15102 THERMO., STD OPEN GRADE, WHITE, SOLID, 8"	
0711 15131 THERMO., STD OG, WHITE, SKIP, 6" (10/30)	
0711 15201 THERMO., STD OPEN GRADE, YELLOW, SOLID, 6"	

*Note* Notice that the items included with pay item 710-90 are shown with the pay item numbers. These should have an "\*" shown instead. Also note that some of the items like the arrows and messages are shown totaled together per pay item and not broken out by type of marking. Depending on the District, these items may need to be broken out by type in the sheet.

15. Right-click on the new link in the LDM dialog and select Open Source. Excel opens.

🕌 FDOT Linked Data Manager	1.01.10	_	. 🗆	×
ce   🍋 🗶   🚺 🎼	8			
ID Source Path	Description	Туре	Update	Locked
2802 \signing\Tabulation_of	Overet Open Source Update Now Fit Lock Data Delete Link Delete Link and Graphics Properties Add (Create Link)	XLS		
C:\e\projects\22049555201				.:

- 16. In Column A, select the pay item 0706 3 for the Retro-reflective Pavement Markers. Type in an asterisk (\*).
- 17. Using the cursor, select the green square at the bottom right corner of the cell and drag it down to copy the value to the paint items. (Do not include the pay item 0710 11290, Paint, Std. Yellow, Island Nose. This item is not included in the 710-90 pay item.)

ਜ਼ ਙਾ ∂ਾ	÷
File Home	Insert Page Layout Formulas Data Review View
Paste	FDOT Mono Bold $\cdot$ 7.5 $\cdot$ A $\cdot$ A $\cdot$ $\equiv$ $\equiv$ $\equiv$ $\gg$ $\cdot$ $\approx$ $\cdot$
Clipboard	Fail Font Fail Alignment
B26 *	THERMO., STD., WHITE, SOLID, CROSSWALK
A	
7 0700 112	SINGLE POST SIGN, FURNISH & INSTALL, 12-20
8 0700 174	SINGLE POST SIGN, FURNISH & INSTALL, MORE THAN
9 0700 2 12	MULTI-POST SIGN, FURNISH & INSTALL, 12
10 0700 2 13	MULTI-POST SIGN, FURNISH & INSTALL, 21 TO 30
11 0700 2 18	MULTI-POST SIGN, FURNISH & INSTALL, 12
12	RETRO-REFLECTIVE PAVEMENT MARKER
13 •	PAINT, STD., WHITE, SOLID, 6"
14 •	PAINT, STD., WHITE, SOLID, 8"
15 •	PAINT, STD., WHITE, SOLID, CROSSWALK/RA, 12"
16 •	PAINT, STD., WHITE, SOLID, DIAG./CHEVRON, 18"
17 •	PAINT, WHITE, SOLID, STOP LINES/CROSSWALK, 24"
18 -	PAINT, STD., \HITE, SKIP, 6" (10/30)
19 •	PAINT, STD., WHITE, DOTTED EXT., 6" (6/10)
20 •	PAINT, STD., MESSAGE OR SYMBOL (MERGE)
21 •	PAINT, STD., ARROWS (MERGE)
22 •	PAINT, STD., YELLOW, SOLID, 6"
23 •	PAINT, STD., YELLOW, SOLID, DIAG/CHEVRONS, 18"
24 -	PAINT, STD., YELLOW, DOTTED EXT., 6" (6/10)
25 0710 11290	PAINT, STD., YELLOW, ISLAND NOSE
26 0711 11123	THERMO., STD., WHITE, SOLID, CROSSWALK/RA, 12"
27 0711 11124	THERMO., STD., WHITE, SOLID, DIAG./CHEVRONS, 18"

- *Hint* Hold down the *shift* key in Excel to select multiple worksheets when the same change needs to made for multiple sheets. Don't forget to Un-Group the worksheets when finished before modifying individual cells or text.
- 18. Select **File > Save** to save the changes in the **Excel** file.

19. In MicroStation, right-click on the link in *LDM* and select Update Now.



	TABULATION OF QUANTITIES																			
PAY								SH	EET N	UMBER	15						TO TH	TAL	GR	AND
NO.	DESCRIPTION	UNIT	<b>S</b> -	01	S-02		S-03		5-04								SH	EET	10	AL
			PLAN	FINAL	PLAN	FINAL	PLAN F	E I NAL	PLAN	FINAL	PLAN	FINAL	PLAN	FINAL	PLAN	FINAL	PLAN	FINAL	PLAN	FINAL
0700 1 11	SINGLE POST SIGN FURNISH&INSTALL LESS THAN 12	AS	13		6		9		2								30		30	
0700 1 12	SINGLE POST SIGN, FURNISH & INSTALL, 12-20	AS	-4		- 2		-4		1								- 11		1	
0700 1 74	SINGLE POST SIGN, FURNISH & INSTALL, MORE THAN	AS							1											
0700 2 12	MULTI-POST STGN, FURNISH & INSTALL, 12	215																		<u>م م</u>
0700 2 13	MULTI-POST STOR, FURNISH & INSTALL, 21 TO 30	AS	1																	
0700 2 18	MULTI-POST SIGN, FURNISH & INSTALL, 12		1.0										_				1.0			
	ALTAU ALLELITE PARCHERT HARKEN	CA CH	128		0.000		240		0.000							ک	390		390	<u>ک م</u>
	AINT, SID., WHITE, SULID, B	0.0	0.344		0.33/		0.300		0.062								1.249		1.249	
	PAINT, STO., WHITE, SULD, 8	OR LC	0.032		0.023		0.099		0.024								0.178		0.178	
	PAINT, STD., WHITE, SULID, DAG (CUERDAN, 12	1.5	250 0		6.0		160 2		16.6	_			_				2294.0		220	
	Aller Butte Collo Statistic Statistics and	1.0	60.7		0.0		66.0		10.0	_		_	_				134.7		333	
-	ANNI, MATER, AULD, AND CHERALADAMAK, 24	GM	0 292		0 242		0.076						_				0.500		0 500	
	PAINT STOL WHITE DOTED FAT 5' (6/10)	GM	0 072		0 018		0.061						_				0.150		0.150	
	PAINT STO MESSAGE OB SYMBOL (MERGE)	64	5										_				6		6	
	AINT, STOL, RESPUE OF STRUCE (READ)	FA	11										_				12		12	
	PAINT STD YELLOW SOLLD 6"	GM	0 318		0 266		0 344		0 130				_				1 058		1.058	
	PAINT, STD., YELLON, SOLID, DIAG/CHEVRONS, 18*	1.5	47.2				252.1		22.6								322.0		122	
	PAINT, STD., YELLOW, DOTTED EXT., 5" (6/10)	GM					0.098										0.098		0.098	
0710 11290	PAINT, STD., YELLOW, ISLAND NOSE	SF	28.4				85.3										113.7		114	
0711 11123	THERMO, STD., WHITE, SOLID, CROSSWALK/RA, 12"	LF	294.1														294.1		294	
0711 11124	THERMO., STD., WHITE, SOLID, DIAG./CHEVRONS, 18"	LF	158.0		6.0		158.3		16.6								338.9		339	
0711 11125	THERMO., STD., WHITE, SOLID, STOP LINE, 24"	LF	69.7				65.0										134.7		135	
0711 11141	THERMO, STD., WHITE, DOTTED EXT., 6" (6/10)	GM	0.072		0.018		0.061										0.150		0.150	
0711 11160	THERMO., STD., MESSAGE OR SYNBOL (MERGE)	EA	5		1												6		6	
0711 11170	THERMOPLASTIC, ARROWS	EA			5		-4										20		20	
0711 11224	THERMO., STD., YELLOW. SOLID, DIAG./CHEVRONS, 18*	LF	47.2				252.1		22.6								322.0		322	
0711 11241	THERMO., STD., YELLOW, DOTTED EXT., 6" (6/10)	GM					0.098										0.098		0.095	
0711 14125	THERMO., PREFORMED, WHITE, SOLID, 24"	LF	239.6														239.6		240	
0711 14160	THERMO., PREFORMED, MESSAGE OR SYMBOL (BIKE)	EA	3		2		5										10		10	
0711 14170	THERMO, PREFORMED, ARROWS (BIKE THRU)	EA	3		2	-	S		<u>التحمد</u>								10		10	<u>المتحدم ا</u>
0711 15101	THERMO., STD. OPEN GRADE. WHITE, SOLID, 6"	GM	0.544		0.337		0.306		0.062								1.249		1.249	
0711 15102	THERMO., STD OPEN GRADE, WHITE, SOLID, 8"	GM	0.032		0.023		0.099		0.024								0.178		0.178	
0711 15131	THERMO., STD OG, WHITE, SKIP, 6' (10/30)	GM	0.182		0.242		0.076										0.500		0.500	
0711 15201	THERMO., STD OPEN GRADE, YELLOW, SOLID, 6"	GM	0.318		0.266		0.344		0.130								1.058		1.058	