State of Florida Department of Transportation



# **FDOT Civil 3D Quantities**

## **User Training Guide**

April 7<sup>st</sup>, 2021

PRODUCTION SUPPORT CADD OFFICE TALLAHASSEE, FLORIDA Randy Roberts

http://www.fdot.gov/cadd

Copyright © 2018 by Florida Department of Transportation All rights reserved For information about this and other CADD training courses, publications, videos, and Frequently Asked Questions, visit the Production Support CADD Office of the Florida Department of Transportation on the world-wide web at <u>http://www.fdot.gov/cadd</u>.

## FDOT C3D Quantities

#### **Description**

This workshop teaches students fundamental use of the FDOT Civil 3D State Kit, and the Florida Department of Transportation (FDOT) Computer Aided Drafting and Design (CADD) standard resources and applications to generate Quantity reports.

This workshop includes but is not limited to:

- General topics on Civil 3D
- Exploring the FDOT20xxC3D Desktop Folder
- Setting up Data Shortcuts Working Folder and Creating Data References
- Create File Application for Creating Project Base Files
- FDOT Entity Manager (EMX)
- Using Model and Paper Space
- Using FDOT Takeoff Manager (FTM) to generate different reports
- Editing Reports in Excel.
- Linking Created Reports into the design file
- Creating a Summary of Pay Items

#### <u>Prerequisites</u>

- Some Cad drafting or related AutoCAD Civil 3D experience
- Experience with working with Entities that contain Pay Items

#### Duration: 16 Hours

#### **Objectives**

After this course, the student will use the FDOT Civil 3D State Kit and the FDOT CADD standard resources and applications to generate Quantity reports, which will then be linked to the design files necessary to complete a typical FDOT project.

#### <u>Audience</u>

Students involved in preparation of FDOT Quantity reports for all disciplines of a typical FDOT project at the Beginner, Intermediate and Advanced Levels.

#### <u>Prerequisites</u>

- Some manual drafting or related CADD product experience
- AutoCAD Essentials (R Guides)

#### Duration: 12 Hours

#### Professional Credit Hours: 12 PDHs

*Note* PDH Credit will only be available with Instructor lead or Computer Based Training (CBT) thru Learning Curve.

Copyright © 2018 by Florida Department of Transportation All rights reserved For information about this and other CADD training courses, publications, videos, and Frequently Asked Questions, visit the Production Support CADD Office of the Florida Department of Transportation on the world-wide web at <u>http://www.fdot.gov/cadd</u>.

## TABLE OF CONTENTS

1	INTRODUCTION		1-1
	Objective		
	General Information		
	Exploring the EDOT20xx(	`3D Deskton Folder	1-1
	Exercise 1.1 S	etting Data Shortcut Working Folder	
	Data Shortcuts	-	1-3
	XRef vs. data reference		1-4
	FDOT Standards		
	FDOT Standard Files		1-5
	Setting Up the OTDSR	) file	1_5
	Creating the Project B:		1-5 1_5
	Evercise 1.2 C	ireate the Base Files for a Droject	1-5
	Exercise 1.2 C	reate Additional Files	1-0 1 7
	Exercise 1.5 C	reate Additional Files	1-7
	Attributes, Text and Mod	els	1-7
	Layers		1-7
	Rules & Filters		1-8
	Exercise 1.4 L	ayers and Filters	1-9
	Text Styles		1-11
	Text Styles Dialog		1-11
	True Type Fonts		1-11
	Style Organization		1-12
	Model & Paper Space		1-12
	Annotation Scale		1-13
	Exercise 1.5 A	nnotation Scale and Text Styles	1-14
2	DESIGN TOOLS		2-1
	Objective		2-1
	FDOT Tools used to draw	or place Pay Item Data	
	Entity Manager (EMX).		2-1
	Entity Manager Mer	าน Buttons	2-2
	Design Settings		2-3
	Design Mode		2-3
	Adhoc Attributes		
	Defining Adhocs for	Quantities	2-5
	FDOT Signs		2-5
	Assembly Creation		2-6
	Assembly Creation -	Panel	
	Assembly Creation -	Post	
	Assembly Creation -	- Placement	
	Labels		
	Labels – General Set	ttings	
		-	

	Labels – Panel		2-10
	Labels - Post		2-11
	FDOT Multi-Line		2-11
	Pavement Markings	5	2-12
	Place Block Group		2-14
	Block Group Tab.		2-14
	Location Tab		2-15
	FDOT Traffic Palette	2	2-15
	FDOT Civil Blocks		2-16
3	WORKING WITH SH	IAPES	3-1
	Objective		
	Introduction		
	Exercise 3.1	Setting up the design file	3-1
	Exercise 3.2	Create a Project Specific database	3-2
	Exercise 3.3	Creating Pavement Shapes and Sheet Layouts as Models	3-3
	Autodesk A360 D	rive	3-7
	Exercise 3.4	Creating Sidewalk Shape	3-9
	Exercise 3.5	Creating Sod/Turf Shapes	3-10
	Exercise 3.6	Working with Shapes in EMX	3-13
4	WORKING WITH LI	NEAR ENTITIES	4-1
	Objective		
	Introduction		
	Exercise 4.1	Drawing New Guardrail and Appending to Existing Guardrail	4-1
	Exercise 4.2	Drawing and Appending Xdata to Traffic Separators	4-3
	Exercise 4.3	Appending Xdata to Curb and Gutter	4-4
	Exercise 4.4	Associating an Alignment to Entities	4-5
	Exercise 4.5	Using EMX Offset command	4-6
	Exercise 4.6	Using EMX Match Properties command	4-8
5	DRAINAGE NETWO	RKS	5-1
	Objective		5-1
	Introduction		
	Drainage Componer	nts	5-2
	How the Parts Catal	og Works	5-2
	Drainage Part List Ir	Iformation	5-2
	Information Tab:		5-2
	Pipes Tab:		5-3
	Structures Tab:		5-4
	Summary Tab:		5-5
	Exercise 5.1	Appending additional Pay Item Information to Drainage Parts	5-6
6	FDOT TAKEOFF MA	NAGER	6-1

	Objective		6-1
	Introduction		6-1
	Takeoff Manager		
	Quantity Reports ta	b	6-2
	Pay Item Filters		6-3
	Compute Takeoff		6-3
	Summary Tables Ta	b	6-4
	Report Viewer		6-4
7	QUANTITIES BY SHE	ET	7-1
	Objective		7-1
	Introduction		
	Exercise 7.1	Running a Report using Quantities by Sheet and Linking to file	
8	QUANTITY REPORT	S	8-1
	Objectives		8-1
	Introduction		8-1
	Exercise 8.1	Run a Linear Report	
	Report Viewer		
	Exercise 8.2	Running a Formatted Linear Report	8-3
	Exercise 8.3	Running a Guardrail Report	8-5
	Exercise 8.4	Running a Linear report with Modified Station Values and Offsets	8-5
	Exercise 8.5	Running Shape Reports	8-6
	Exercise 8.6	Running Multiple Reports at Once	
	Exercise 8.7	Running reports using the Pay Item Filters	8-8
	Exercise 8.8	Running a Report with a Xref and Drainage Networks	8-9
9		/ REPORTS	9-1
	Objectives		
	Introduction		
	Table Command		
	FDOT Summary Box	File Location	
	Exercise 9.1	Accessing the location of the Summary Boxes and Reports	
	Exercise 9.2	Linking Summary of Sidewalk & Detectable Warnings report	
	Exercise 9.3	Linking the Summary of Guardrail report	9-5
	Exercise 9.4	Running a Summary of Pay Items Report	

# **1** INTRODUCTION

## **O**BJECTIVE

This chapter divides into two sections:

- Computer Aided Drafting and Design (CADD) Standards & File Creation:
  - FDOT20xxC3D Desktop Folder
  - File Creation
  - Base Project File Setup
- AutoCAD Features/Concepts:
  - o Layers
  - o Feature Lines
  - o Text Styles
  - o Annotation Scale
  - o Model & Paper Space

## **GENERAL INFORMATION**

This chapter reviews the FDOT20xxC3D working environment including how to create design files properly that meet Florida Department of Transportation (FDOT) CADD standards and introduces concepts and tools used to make producing plans more efficient. This manual refers to xx as being the latest version of the State Kit.

Abbreviations used in this manual;

- EMX Entity Manager
- FTM FDOT Takeoff Manager
- BOE Basis of Estimates
- DLM Data Link Manager
- Xdata Pay Item Data
- Xref External Reference Drawings
- Dref Data Reference of Civil 3D objects

## EXPLORING THE FDOT20XXC3D DESKTOP FOLDER

The FDOT CADD software installer installs a folder named FDOT20xxC3D on the desktop. This folder contains shortcuts to applications used when working on the FDOT projects.

Chapter 1



The figure below shows the contents of the FDOT20xxC3D folder.

Using these shortcuts to start the applications will provide the designer with the environment properly set with the FDOT CADD standards. The installer will place a shortcut on the desktop to start the State Kit. The shortcut icon is shown in the image above located on the top left.

# *Note* When systems have AutoCAD, Civil 3D installed along with The FDOT Civil 3D State Kit Suite installed, it is recommended the user start the State Kit with the desktop icon.

Double Clicking on the C3D20xx desktop shortcut starts Civil 3D in the FDOT environment. Selecting the FDOT Ribbon shows all the applications and commands available to the designer. As shown below.



#### **Exercise 1.1** Setting Data Shortcut Working Folder

If this is the first time you have opened the FDOT Civil 3D State Kit you will need to set the data shortcut working folder to point to your project folder location.

1. Hover your mouse over the word **Data Shortcuts** located in the tool space and **Right Click** to bring up the following options.



- 2. Select **Working Folder** to browse to the Root folder location of your project, be careful not to select the actual folder of your project.
- 3. Repeating the previous step, right click on the *Data Shortcuts* path again and select **Set Data Shortcuts Project Folder**. A list of projects will appear, select the following.

	Name	Description	
0	22049555201		
olde	er Name:		
220	049555201		

4. Select **OK** to Close the dialog.

## **DATA SHORTCUTS**

A data shortcut is a link between drawings that allows specific types of Civil 3D data to be shared. The shortcut itself does not contain data, but it is a pointer, directing Civil 3D to read information from a common pool of data. A data shortcut is created in the source drawing, and a data reference is the manifestation of the data in a recipient drawing. There are many situations in which you need data or information to link between drawings. Connections between drawings can be in the form of external references (Xref's), data references, or a combination of the two. These two options are similar but not the same. The following table compares them.

## **XREF VS. DATA REFERENCE**

EXTERNAL REFERENCE (XRef)	DATA REFERENCE
For most objects, an Xref is a graphic-only representation of objects created in another drawing	A data reference is an information/graphic-only link to Civil 3D data created in another DWG file.
Any objects (base AutoCAD or Civil 3D) can be displayed in XRefs	Only specific types of Civil 3D data can be used as data references
Visibility of objects is controlled by original drawing styles and layers	Visibility of data is controlled by host drawing styles and layers
With the exception of Catchment and Intersection objects, you can use the Civil 3D Add Labels commands on items in an Xref. All other objects (e.g., Surfaces, Alignments, Pipes, Profile Views, etc.) can be labeled through an XRef	To use Civil 3D object data in design (i.e., using a surface to create and existing ground profile or using an alignment as a corridor baseline), the object must be data referenced

Civil 3D objects that can be Data Referenced;

- Corridor
- Alignments
- Surfaces
- Profiles
- Pipe Networks
- Pressure Networks
- View Frame Groups

## **FDOT STANDARDS**

FDOT provides several resources to instruct and aid designers in computing pay item quantities. The Estimates Office publishes the *Basis of Estimates Manual*, the governing document that specifies how to compute each pay item. The Estimates Office also provides a *Master Pay Item* list containing every pay item available for use in Florida. The FDOT Civil 3D State Kit provides tools to simplify the process of generating quantities. The Entity Manager Application uses a database (PayItemdb.xml) and several Report styles are delivered with the FDOT State Kit. The EMX database is pre-set to comply with both drafting standards specified by the *CADD Manual* and the Pay Item Computation Methods supplied by the *Basis of Estimates Manual*.

FDOT recommends the use of Civil 3D Feature Lines for linear features, since they can easily be extracted from the corridor model. FDOT also recommends the use of EMX for all quantity shape hatching. The *AECmerge.xml* database that is supplied by FDOT includes nearly all items that will be used on a FDOT project.

## **FDOT STANDARD FILES**

FDOT has two standard File Names, that are to be in the discipline directory, for storing quantities:

- o DSGN\*\* for Linear/Each Features (where \*\* indicates the 2-letter characters for the discipline)
- QTDSRD for Area/Tonnage/Cubic Yard Features

## SETTING UP THE QTDSRD FILE

The QTDSRD is the file used to create the shapes required to calculate the area quantities. FDOT recommends the use of sheet layouts within this file instead of creating a separate DWG file for each pay item and its shapes. Each sheet layout uses the same references. The shapes are then controlled by manipulating the layers on each sheet layout.

## **CREATING THE PROJECT BASE FILES**

The FDOT workflow uses the Create File application to create AutoCAD design files and other files in accordance with the FDOT standard file naming conventions. Create File uses a database file. that is included when the State Kit is installed, this file is maintained by the CADD office and isused in the FDOT ORD State Kit. The file contains all design file naming conventions along with the appropriate symbology (Layers, Colors, Line Types, etc.). The application can only be launched from inside Civil 3D. It is located on the Top Left of the FDOT Ribbon.



*Note* When the Create/Open File button is selected the file is created and opened. The user can make as many files as needed in one session of the application. When all files are created select Close to exit the dialog.

You will need to save the open files if you want to keep them, otherwise if you don't they won't be saved at all.

#### **Exercise 1.2** Create the Base Files for a Project

> In this exercise, you will create The QTDSRDxx.dwg for shapes and areas.

*Note* This process is the same for any discipline.



- 1. Double click on the **FDOT20xxC3D** Icon on the desktop. At the time of this manual the 2020 version is the most current. Your version may vary, but the process is the same.
- 2. When Civil 3D is loaded click on the FDOT Ribbon.



3. Click on the **Create File** icon <sup>Create File</sup> to launch the application.

A Create Fi	le (v 2.0)			×	
	010 100 0		10555004	Colored Devices	
Project: C:\Civil 3E		019 Projects\Dataset - Start\220	49555201 ~	Select Project	
Discipline:	ROADWAY		~		
1.1					
File Group:	Roadway File	15	~		
File Type:	- Dimension	Deservation		<b>^</b>	
Dd		Description		^^	
INT	PRD	Intersection Interchance Profile			
N OT	nsen	Quantity Computation Shapes	Calculations		
QU	ANRD	Quantity Computation Details	Carcalatoria		
BD	KSRD	Border Sheet Reference File for	or Cross Section Sheet		
RD	XSRD	Roadway Cross Sections, Patt	Roadway Cross Sections, Pattern Line and Shapes		
RW	DTRD	Right of Way Details for Roady	way		
GK	LNRD	Geopak Lines for Existing Feat	ures		
TCDSRD		Traffic Control Design			
TCI	OTRD	Traffic Control Detail Sheet			
TC	PLRD	Traffic Control Plan Sheets		~	
Output File					
			File		
	Base Filenan	ne: Modifier (Optional)	Sequence #:	Extension:	
	QTDSRD		02	.dwg	
Output File	C:\Civil 3D 20	019 Projects\Dataset - Start\220	49555201\roadway\Q1	DSRD02.dwg	
Output Fol	der: roadway			Browse	
Template	fdotmast	er.dwt		Browse	
County	Wakulla	Coordinate Syst	FL83-NF V		
county.					
			Create - Open File	Close	

- 4. With the *Data Shortcut Folder* already set in Civil 3D it is automatically filled in on the Project portion of the Create File application. If not, you can either Exit and set it <OR> you can select the Select **Project** button to navigate to it.
- 5. The Coordinate system is already set to FL North, this is because you set your data shortcut folder before creating your files.

*Hint* If you change the County, notice how the coordinate system updates. This is due to the relationship Create File has with the Database.

- 6. Select the *Discipline* pull down and select **ROADWAY**. This sets the discipline to work in. Quantity files are part of the Roadway Discipline. It is important to know how to do this in case it is required to use a different option in the future or if the standards ever change.
- 7. In the File Group category, use the drop-down arrow to select Roadway Files.
- 8. In the *File Type* category select the file **Quantity Computation Shapes-Calculations.** (This selection populates the *Output File and Template File* with the correct information.)

- *Note* Create File/Project allows the designer to browse to a different **Output Folder** if needed.
- 9. Click the **Create/Open File** button at the bottom of the dialog to start the file creation process; you can click Close to exit the dialog, but leave the application open as you will create additional files.
- *Note* Notice below the Create and Open File buttons that the file name is shown. If the file QTDSRD01 already exists in the project, the application will increment the file name to QTDSRD02 and will not overwrite the existing file.

#### **Exercise 1.3** Create Additional Files

Use the same File Group to create additional design files.

- 1. Using the Create File application select the Summary of Quantities Sheets (SUMQRD) file.
- 2. Click the Create/Open File button.
- 3. Click **Close** to exit the application.
- 4. Save the file and Close Civil 3D.

## **ATTRIBUTES, TEXT AND MODELS**

## LAYERS

FDOT has created six Standard Layer libraries: Common, Survey, Right of Way, Roadway, Photogrammetry and Structures. There are approximately 1500 Layers. The appropriate Layers and Layer Filters load upon the creation or opening of a FDOT Design file using the Create File application. The Layer name is a maximum of 18 characters and has three components: Layer Name, State and View with the format: *object\_sv* 

Where: (object = Layer) (s = State) (v = View)

(S)tate Designations	(V)iew Designations
<b>p</b> (proposed)	<b>p</b> (plan)
<b>d</b> (drafting entity)	<b>r</b> (profile)
e (existing)	<b>x</b> (cross section)
	<b>m</b> (model)

An example of a Existing Plan view Layer is: **PavtMessage\_ep**, where: Layer = PavtMessage, State = e and View = p

*Note* Some Layers do not show a State or View in their name. These Layers are by default set to be a proposed plan view entity. An example is the Layer (RPM1), created for proposed RPM's in the plan view.

The Layers symbology (color, weight and Line Type) are set to *ByLayer*, which means each Layer has a color, weight and style associated to it and controls all objects placed on that particular layer. It is recommended that Designers not create additional Layers since they will not QC.

#### **RULES & FILTERS**

FDOT has also created a set of Layer Filters that group the Standard Layers together for Quality Control (QC) checking of the FDOT Standard design files ensuring compliance with the FDOT CADD Standards. FDOT delivers Layer Filters to reflect each of these Standard Rules to assist in users searching through the Layer menu. Discussion on these filters continues later in this section. The Standard Layer Filters do not turn Layers on or off, but they reduce the number of Layers visible in the layer properties dialog box.

To switch a Standard Layer Filter, open the Layer Properties Manager dialog on the Home Ribbon.



There is an expandable Standards drop-down menu as seen in the figure below to load Layer filters, click on the desired filter, notice how the number of displayed layers updates for each filter.

*Note* FDOT presets Standard Layer Filters to each Standard File Name. The filters automatically set by default to those specific file names upon opening of the design file.

Filters	« S. Name	▲ 0. F., L.,	P. Color
E All	BaselineSurvey	V ÷× ₫	white
- 🖾 All Used Layers	BikeLaneColorPavt	Œ.	Green
- Trafting Elements	CLConst_dp	A the second sec	e white
- Misc and Scratch	Cloud_dp	A the second sec	😔 📘 cyan
E Standards		Υ·	e red
algnrd	ConduitAG	¥ ÷÷ ⊞	🗢 📘 yellow
autosp	ConduitBM	Œ.	😅 🗖 magenta
i cliprd	ConduitDB	A .ö. 🔤 .	😔 🗖 green
drdtrd	Conduit/B	Ă Ĉ Ș	🗢 📕 red
drxsrd	Conduit01	V ÷S ⊡.	🗢 🗖 blue
🛅 dsgnld	ConstArea_dp	Ă S 🖬	white
dsgnlt	ConstLimits	V ÷ dĩ	🕀 📕 red
- 🗇 dsgnrd	ConstLines	V ÷S ⊞.	🐨 📘 blue
🗇 dsgnsg	ConstLines_pm	8 <del>- </del> - 6	🗟 🗌 yellow
- 🤍 dsgnsp	CrossWalk1	8 <del>×</del> ¶	🗢 📕 white
🗇 dtmrd	Z CrossWalk2	8 <del>- ×</del> - <del>1</del>	🖯 🔤 white
- 🗇 gdtmrd	Z CurveData_dp	8 <del>- ×</del> - <del>C</del>	🖨 🗌 yellow
🗇 geotech	CurveDataLabel_dp	8 ÷ 🖷	🖨 🔳 white
i gswksp	Z Delineator	8- <u>ö</u> -d°	🕀 📃 yellow
irrgld	DimLines_dp	8 ÷ 🗗	🕀 🔳 white
itssp	DirArrowsPavt	8 ÷ 🛱	🕀 🔳 white
i keysht	Z EaseLicLine	§-☆-6°	🕀 🔳 white
msarsp	∠ GridMaj_dp	8 🔅 🗗	🕀 📕 red
pdxsrd	GridMin_dp	8 🔅 🗗	🕀 🔳 white
- planrd	GridMinSub_dp	8 🌣 🗗	🖨 🔲 225,225,
plprrd	GSBWFill	S 🔅 🖳	🕀 🔳 white
atdsrd	GSColorFill	S 🔅 🖫	🕀 📃 green
rdxsrd	GSDims	8 ÷ 🛱	🕀 🔳 white
rdxssp	GSOutline GSOutline	S 🔅 🖫	🕀 🔳 white
- rwdtrd	GSSign	S 🔅 🖳	🖨 📘 cyan
rweng10	ImageAttachment_dp	8 ÷ 🛱	🕀 🔳 white
survrd	🖉 InRoadLight	S 🔅 🖫	🕀 🔳 white
tcdsrd	Z LaneDirArrow	S 🔅 🖳	🕀 🔳 white
tvpdrd	Z LeaderLine_dp	γ÷	🕀 🔳 white
utadrd	Z Logo_dp	8 ÷	🕀 🔳 white
utprrd	MatchLines_dp	8 ÷ 🖨	🕀 📘 blue
Text	MetalButtons	ያ 🗴 🔐	🕀 🔳 white
XReferences	Miscellaneous0	9 × 🖷	🕀 🗖 blue
Andreferences	Miscellaneous1	n x n	🕀 🗖 blue
D Invest filter	Aliccollonoous?	ő.X.e	A Blue

#### **Exercise 1.4** Layers and Filters

This exercise will cover investigating Layers and Layer Filters delivered by FDOT. The entities placed in this exercise are not part of the final design; they are for experimenting and practicing only.

1. Open the fdotmaster.dwt as shown below.

A Select File				×
Look in:	Templates	~	🔶 🖳 🔇 🗙 🖳	<u>V</u> iews <b>v</b> Tools <b>v</b>
History Dataset - Start	Name Non-Civil Discipline Sheets TXT XLSX CombinedLayers digitalsignature fidotdefault fidotmaster	^	Preview	
Favorites	<ul> <li>keysht</li> <li>planrd</li> <li>rwdtrd</li> <li>spst10</li> <li>StructuresTemplateDetail</li> <li>StructuresTemplatePlan</li> <li>survey</li> </ul>	>	Initial View	
	File name: [fdotmaster			✓ Open ▼
	Files of type: Drawing Template (*.d	wt)		✓ Cancel

2. From the *Home Ribbon* select Layer Properties to open the Layer Properties Manager dialog.

*Note* As a refresher, a Layer filter isolates the Layers seen in the Layer dialog so it is easier to navigate. FDOT groups the Layer filters by discipline and sets them by the filename.

3. Expand the *Standards* folder in the *Filters* section of the dialog.

×						
Ê.	Current layer: SignSupport : Ground Mounted Sign Support Symbol (All Types)					
×	• ● → ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●					
	Filters «	S Name		0. F., L	P.	Color
	⊢- € All	Z SignCantilever		8 🔆 🖞	۹ م	white
	All Used Lavers	SignCantilever_ep		🖓 🖄 🚮	۹ (	white
	Drafting Elements	🖉 SignDetail		8 🔅 🖁	۹ (	white
	Misc and Scratch	∠ SignLettersAZ		8 🔅 🖁	۹ (	white
	Standards	Z SignMisc		8 🖄 🖁	۹ (	red
	algnrd	Z SignMisc_ep		8 🔅 🖁	۹ (	blue
	autosp	Z SignPanel		8 🖄 🖁	۹	white
	- 🗇 cliprd	Z SignPanel_ep		8 🔆 🖪	°⊖	white
	- 🗇 drdtrd	Z SignPanelBorder		8 🔆 🖁	°⊖	white
	- 🗇 drxsrd	Z SignPanelC		8 🔆 🖞	°₽	blue
	🔚 dsgnld	Z SignPanelDetRed		8 🔆 🖞	۹ (	red
	- 🗇 dsgnlt	Z SignPanelG		8 🔆 🖞	°⊖	green
	- 👘 dsgnrd	Z SignPanell		8 🔅 🖪	•⊖	140,88
	🛅 dsgnsg	Z SignPanelT		8 🔆 🖪	° 🕀	255,16
	🔍 dsgnsp	Z SignPanelW		8 🔅 🖁	°⊖	yellow
	🛅 dtmrd	Z SignSingle_ep		8 🔆 🖪	۰Ð	red
	🧊 gdtmrd	🥏 SignSpanwire		8 🔅 🖷	° 🖨	green
	🗇 geotech	🥏 SignSpanwire_ep		8 🗙 🖁	° 🖨	green
	🗇 gswksp	Z SignSpecial		8 🗙 🖷	•⊖	green
	irrgld	SignSupport		8 🗙 🖁	° 🕀	blue 📃
	🛅 itssp	Z SignSymbol_px		8 🗙 🖷	۰e	yellow
	keysht	Z SignTruss		8 🗙 🖁	° 🖨	red
	💼 msarsp	Z SignTruss_ep		8 🖸 🗗	•	red
	pdxsrd	SignTrussOH_ep		8 × 4	•	white
		- 6 1 10 1 1		$\cap \times \circ$	N	- DEC 10

- 4. Scroll down and double click the *Layer* **SignSupport.** That sets the active Layer and sets the *Color*, *Weight* and *Style* to **ByLayer** which means all entities drawn or placed will be under the influence of the layers properties. Note the Green checkmark next to the layer name which denoted the current Layer.
- 5. Collapse the *Standards* folder and click on the **Text** filter. Note all the Layers that contain text are now visible.
- 6. Click on the other filters to get familiar with what they offer.



*Note* You can also type in LAYERP on the command line to open the Layer Properties Manager.

7. Hover & right click on the *Title Bar* and examine the options to control the behavior of the dialog, you can dock it on either side of your screen or move it to another monitor. Refer to Civil 3D help for further information regarding the Layer Properties Manager.

3	Move
	Size
	Close
~	Allow Docking
	Anchor Left <
	Anchor Right >
6	Auto-hide
	Transparency
AVER PROPERTIES M	Invert filter
_ Х	References: 5 layers displayed

8. Click on the **X** located in the top left corner to close the dialog. Layer filters can save time when going from Line work to Text and so on.

## TEXT STYLES

A text style is comprised of a group of text attributes, such as font, width, height, spacing and so on. Text styles take away the burden of having to set all the individual text parameters. FDOT delivers predefined text styles for use whenever possible. The text styles delivered by FDOT are at a scale of 1 to 1. This is important to remember placing text using Annotation Scale. A more detailed discussion of Annotation Scale comes later in this section.

#### TEXT STYLES DIALOG

Note	The Text Styles dialog can be accessed by typing ST on the command line.
11000	The reaction and great we debeed by typing or on the command more

olyles.		Font		
Annotative	^	Font Name:	Font Style:	Set Curre
		Τ <mark>Έ</mark> FDOT ~	Regular $\sim$	New
FDOT-NonAnnotative		Use Big Font		
FDOT Table Data		C		Delete
FDOT Table Header		Size Annotative	Paper Text Height	
FDOTHeavy		Match text orientation	0.0700	
<	>	to layout		
All styles	~	Effects		
ni styles	-	Upside down	Width Factor:	
			1.0000	
A > Rh1	22	Backwards	Oblique Angle:	
Аарии			obliquo / rigio.	

The Text Styles dialog shows all the text styles that exist in the design file, and all the parameter settings for each style. When a new file is created and opened using the Create File Application it reads the Fdotmaster template file which will load all the appropriate text styles. FDOT expects no changes made to the delivered text styles.

#### TRUE TYPE FONTS

FDOT has integrated the use of True Type Fonts and restructured the Text Styles. The following implements the True Type Fonts:

- Block Libraries
- o Entity Manager
- Civil 3D Label Styles
- Civil 3D Note Styles
- Spreadsheets

True Type Fonts will ignore AutoCAD weights. The best method to show thicker text is to use the Bold font. The FDOT CADD Software delivers and installs the True Type Fonts in the FDOT20xx.C3D\Support\Font folder on the server and in the Windows\Fonts folder on the client computer.

*Note* If you uninstall older State Kits you may run into an issue where the new State kit can't find the correct FDOT fonts and will substitute. If this happens browse to the font folder in the install location and select all of the TTF Fonts > Right Click and select Install.

#### STYLE ORGANIZATION

Fonts at Common Sizes	40 Scale	50 Scale
Large = .15 x Scale	5.0	6.25
Medium = .1 x Scale	4	5
Small = .07 x Scale	2.8	3.5

## MODEL & PAPER SPACE



The Model tab located on the bottom left corner allows the user to view the overall project as it resides in real time coordinates. The Layout tabs represent an individual sheet as it will be printed. The sheet border with all applicable fields will be added via the Plan Production workflows.



A sheet, when present, has two additional buttons called Model & Paper. The default, when created, is called Paper, which represents Paper Space. Paper Space is a visual representation of how a sheet will print and any text or line work drawn in Paper space is equivalent to drawing on a sheet of paper. It is recommended that details and notes that are not part of a dynamic design or tied to any coordinate zone be placed in Paper space.

If you click on the word Paper or double click within the View Frame itself the Model becomes active and the word paper is replaced by the word model. An active viewport is denoted by a thick red border around the view frame as shown above. A view frame is created for looking at a portion of the drawing model at an exact scale that will be printed as a sheet, think of it as a window through your sheet border at an exact scale with the correct coordinates. View Frame rotation angles can be manipulated without rotating your project by using the 2 Point Twist command on the FDOT Ribbon, which makes labeling and the layout look perpendicular to your border.

*Note* If you use 2 Point Twist make sure to untwist view when labeling is complete. You can un twist a view even if you open a previously saved file that is twisted.

## ANNOTATION SCALE

Annotation Scale associates text and Linestyles placed in the model to a specific scale so if the drawing scale changes in that model the text and Linestyles dynamically change with it. The Annotation Scales are preset within the State Kit. The image below shows the available scales. The default scale is  $1^{\circ} = 40^{\circ}$ 

```
1:1
   1" = 1'
   1" = 2'
   1" = 10'
   1" = 20'
   1' = 30'
  1" = 40'
   1" = 50'
   1" = 80'
  1" = 100'
   1" = 200'
   1" = 500'
  1" = 1000'
  1" = 2000'
  1" = 2 miles
   1" = 4 miles
   1' = 8 miles
  2:1
  4:1
  8:1
   100:1
  1" = 1" (Structure Full Scale)
  1'-0" = 1'-0"
  Custom...
  Xref scales
🙏 1" = 40' 🥆 🌣 🔹 🕂 🖙
```

Using Annotation Scale removes the burden of calculating text height used at specific scales when placing text.

The annotation scale options can be found along the bottom of your screen. See image below. A tooltip is available to describe each button, just hover over with your mouse.



Important items to remember regarding Annotation Scale:

- o Layout Specific
- Annotation Lock must be toggled on for Sheet Layouts
- Can be set in the Model properties
- Can be changed using the Drawing Scale
- o Do Not switch Annotation Scale ON and OFF

#### **Exercise 1.5** Annotation Scale and Text Styles

This is a brief introduction to placing text using FDOT delivered Text Styles.

1. Continue working in the *FDOTMASTER.dwt* set the *active Layer* to **TextLabel.** to set a layer current you can use the *Layer* pulldown on the *Home* tab to change the layer, type in *Textlabel* on the command line, or Double Click on the layer in Layer Properties dialog box.



2. On the *Command Line* type in **Mtext**. The command line asks you to draw a text box from top left to bottom right.



- *Note* Remember with Annotation Scale set there is no need to calculate what text height and width to use; this feature automates the calculation.
- 3. After drawing an area box for the text, the *Text Editor contextual ribbon* appears along the top. Notice the preset font and annotative height (0.07). Get familiar with the capabilities of the robust text editor.

AaBb123 AaBb123	W     B     I     A     ™     Th     FDOT     ▼       U     O     br     ByLayer     ▼	Bullets and Numbering *	M @ 🗎	ABC C	ABC	More •	$\mathbb{X}$
A FDOT FDOT Tab	Match X <sup>2</sup> X, Aa • 🐺 Clear •	Justification	Columns Symbol Field	Spell Edit Check Dictionaries	Find & Replace	60	Close Text Editor
Style	Formatting 👻	Paragraph 🔫 🔰	Insert	Spell Check 🛛 🛛	Tools 🔻	Options	Close

4. In the MText Text dialog, enter a sample text string and place it in the design file.

L.	1	T	Т	Ι	I.	Т	Ţ	Ι	T	Т	Ţ	Ι
	Th	is	5	is	5	a		Te	99	st		

- 5. After entering the text, left click your mouse outside the text box to exit the *mtext* command.
- 6. Change the Annotation Scale from 1:40 to 1:50. Note the change in size of the previously placed text.
- 7. Take time to familiarize yourself with the Mtext dialog and other delivered *Text Styles*.
- 8. Delete the test text and Close and do not save the *fdotmaster.dwt* file. Exit Civil 3D.

For more information on Text and Text Styles see the Autodesk online Help for additional information.

# 2 DESIGN TOOLS

## **O**BJECTIVE

The objective of this chapter is to introduce the designer to all of the design tools used to create FDOT plans that can be quantified and reported accurately. The tools covered are;

- EMX
- FDOT Signs
- FDOT Multiline
- Pavement Markings
- Place Block Group

## FDOT TOOLS USED TO DRAW OR PLACE PAY ITEM DATA

Let's take a tour and examine the tools that are available in the FDOT Civil 3D state kit that can be used to draw, place, edit Pay Item Data on AutoCAD Entities.

## ENTITY MANAGER (EMX)



The Entity Manager application is located on the FDOT Ribbon on the Pay Item Tools panel. Entity Manager uses a proprietary database based on Basis of Estimates (BOE) provided by FDOT. The installation of the FDOT Civil 3D State Kit software places the latest Entity Manager database on the local hard drive in the install folder. For new projects, FDOT recommends starting the EMX application and let it build a new Payitemdb.xml file and save it the project SYMB folder and rename it to the eleven-digit Financial Identification Number (FIN) number. For the 22049555201-project used as the example in this manual, the Payitemdb.xml file is renamed to 22049555201.xml. This allows the designer to modify the file for specific parameters, and protects it from any future maintenance updates

overwriting the file. The latest FDOT Database file is found in the \FDOT20xxC3D\apps\entitymanager\EntityManagerPayitemDatabase.txt.

It is highly recommended that every user that works on projects becomes very familiar with Entity Manager, which sets symbology and automates quantity calculations for linear, each, volume, and area quantities.

FDOT specifically set the database to create entities with the correct Layer symbology according to the FDOT CADD Standards. The database file is set up with discipline folders called categories. Inside of each category are items.

- **Pay Item Categories** The basic component of the hierarchical tree is the Category, represented by a tab. The categories are divided by discipline. The figure above shows the Categories with an expandable + symbol.
- **Items** The other database component is the item. An item could be a drafting item, a compute item or a default item. *Items* contain specific functions related to defined entity symbology or quantity calculations. *Items* are represented by one of three icons:
  - Default Icon This icon means items contain formulas and adhoc data used to set drafting standards that can be drawn in the file using the EMX drawing tools.
  - Drafting Standards Icon This icon means a formula is not assigned, but can still be drawn with the correct symbology.
  - Calculator Icon This icon means items have symbology attached and a formula or compute method. The item has no adhoc data.

ENTITY MANAGER MENU BUTTONS

Entity Manager has a toolbar for easy access of different functions. Summarized below are the functions of each button. A later section in this chapter covers in more detail the tools used to create Pavement Marking plans.



**id** - **Identify** Allows user to select an object in your file to read all the Xdata attached. You can also click in the link to get the adhoc data for editing.

- **Append** The append button allows user to select an item from the categories and append the pay item data to an object in the drawing.

- **Replace** The Replace button allows the user to make a selection from the categories and when the object is selected in the file the existing pay item data on an object will be removed and the new selection be added.

- Hatch. The hatch button is used to hatch shapes for area computations. An area id label is also placed when using this command.

\* - **Remove** The Remove button allows the user to remove all Pay item data from an object in the drawing file.

• Edit. The Edit button allows the user to select an object to edit pay item data such as adhoc information or add notes.

- **Match Properties** The Match properties button behaves like the AutoCAD version with the added benefit of matching pay item data and symbology from a source object to a target object.

**Label Properties** The Label properties button controls the shape label options such as font, size, rotation, suffix, prefix, & layers.

**Highlight Options** The highlight options button control how objects are highlighted so viewing objects with or without pay item data is easier.

#### **DESIGN SETTINGS**

Settings used while using EMX are based on how your Civil 3D environment is set up. The department has set the State Kit up to be a Bylayer standard, meaning that all Colors, Linetypes, and Line weight are controlled by the Layer Property. All symbology is set by the Master Standard spreadsheet that resides in the state kit install folder.

#### DESIGN MODE

Design Mode is the default mode when the EMX is opened. Design Mode is used for the following functions:

- Sets Symbology Standards by use of the **Drawing Tools** on EMX for the placement of AutoCAD entities.
- Place Adhoc Attributes on an entity.

Items are placed in the file by generic AutoCAD commands using the EMX Drawing tools, the items can be placed as pay items for future tabulation.

The Drawing tools as shown below are used to **Place Entities with Influence**, which is another way of saying it attaches the Xdata used to extract quantity reports.

When a command is started using the drawing tools the FDOT Civil 3D Layer symbology is set.

*Note* It cannot be stressed enough how important it is to NOT use regular AutoCAD commands to draw or place Entities, they will **NOT** have the required Xdata attached and you will have to append appropriate Xdata to them.



**EMX Drawing Tools** These tools provide the user ability to use AutoCAD drawing commands to draw entities while having the selected pay item data attached while also using the correct symbology. The drawing Tools from Left to Right.

- Line
- Polyline
- Polygon
- Rectangle
- Arc
- Circle
- Ellipse
- Ellipse Arc
- Insert Block
- Offset
- Multi Lines

#### ADHOC ATTRIBUTES

An Adhoc Attribute is additional information about an entity. Look at it as another property for the AutoCAD entity, i.e. *Layer, Color, Weight*, and *Style*.

By placing an Adhoc on the line, the designer is giving that line additional information. That information could be a chain name, cross slope, profile name, thickness, etc. It is almost limitless as to what can be associated to an entity with Adhocs. Other down-stream applications use these Adhocs.

Some Adhocs are placed in the background and the designer does not interact with them.

The figure below shows the Adhocs that are associated with an item from Entity Manager. These Adhocs are part of the item and are set by default. To open the adhoc editor, select a pay item in the category list and Right Click and select Edit Pay Item Data. Another way to get to the editor is to use the ID button on EMX and select an already placed object, a blue link will appear in the EMX interface you can click to open the editor.

Grade	Pavement	Markings ( Inermoplastic ( Standard ( Solid	A Edi	t Pav Item Attr	ibutes/Adh	ocs - 071	1 15101		×
0711 15101 0711 15102	Therr	Place Polyline with XData	Attribute	es Adhocs					
0711 15201	Therr	Place Pavement Marking		Name	Туре		Locked	Value	
0711 15202	Therr 🞒	Set Layer Only		0711 15101	Unit	~		GM2	
Other Surfac	Paver 🚌	Assign Pay Item		0710 11101	String	~		Paint, Std., White, Solid, 6	
0711 16101	Therr 5	Remove Pay Item		0710 11101	L Lan			CND	
0711 16102	Therr **	Remover by Rem		0/10 11101	Unit	~	$\sim$	GMZ	
0711 16201	Therr	Add To Favorites	*			$\sim$			
8 0711 16202	Therr	Add To Selected							
₽ <b>∂</b> LF	Paver								
0711 11123	Therr 00	Alternate Category							
0711 11124	Therr	Insert Pay Item Data							
0711 11125	Therr 5	Edit Pay Item Data							
0711 11224	Therr	Real Provide P							Cancel
8 0711 11421	Thorn X	Delete						DR UK	Cancer

Other Adhocs are interactive meaning the designer must fill in the parameters. An example is placing guardrails. There are adhocs added to the line that must be defined by the designer.

Note Adhocs with values displayed in red are locked from modification.

Adhoc Attributes are comprised of three types of information that must be defined:

- **Name** The *Name* is an identifying term such as the pay item number used that will be picked up by the takeoff manager.
- **Type** The *Type* identifies the nature of the information, and has various options: Numeric, String, Unit, Quantity, and Remarks.
- Value The *Value* is the actual information used by EMX and takeoff manager picks up, and is determined by the Type. For example, if the Type setting is Numeric then the Value must be a number and will use it as a number.

#### **DEFINING ADHOCS FOR QUANTITIES**

FDOT has set up Adhoc Attributes for many of the Items in the Entity Manager. The functionality of these Adhocs range from setting variables used in the calculation of quantities to adding notes for later retrieval. It is important to note that in many cases specific projects may require modifying these Adhoc values. The creation process of design entities using EMX will assign the default. FDOT recommends the review of these entities to ensure the correct values are set.

To calculate a quantity using adhocs, the Compute Parameters must be set to Adhoc Attributes and adhocs must consist of 1 to 3 set on an entity. As a minimum, an adhoc using the pay item as the name, type set to Unit, and the value set to either the Standard Unit or an equation. If this is the only adhoc set, then takeoff manager will use the item description. If this should be different, a second string adhoc, using the same name as the unit adhoc, can be set with the desired description. A third adhoc type, Quantity, may be used to override the calculated quantity from the design file.

*Note* Place these adhocs on the entities BEFORE running takeoff manager.

For more detailed information please reference the user guide located in the Entity Manager folder or view the quick clip video.

## FDOT SIGNS

Accessible from the FDOT Ribbon on the Pay Item Tools panel, the FDOT Signs Application is designed to assist in the placement of standard sign panels and posts in the signing and marking plans. This tool uses a separate xml file that contains all pay item data required to quantify correctly, it does not use the Entity Manager database. All the signs that are in the *Standard Highway Sign Book* and the *Florida Roadway and Traffic Design Standards* have been included. The application is a palette based program that behaves like other Civil 3D palettes.



The FDOT Signs App has four tabs: Assembly Creation, Labels, Tools & Settings, & User Settings

#### ASSEMBLY CREATION



Starting the process of Creating an Assembly begins when the start assembly button is selected. The image above right opens.

- **Cancels Assembly Creation:** When selected it cancels the assembly creation process and returns to the default dialog as shown above left.
- **Name:** User can assign a name or an automatic default name will be used. A 3-digit counter is added at the end, this allows same named assemblies to exist in the design file without being over written.
- Justify: Allows the panel(s) to be set either Left, Center, or Right in the assembly.
- Structure: The user can designate the assembly structure as Panel and Post, Post Only, or Panel Only.
- **Confirm Assembly Settings:** This is selected when the assembly parameters are set and the designer is ready to move on to the next step.

#### ASSEMBLY CREATION - PANEL

The panel assembly portion of the process is where you pick the panel(s) to add to the assembly and preview your work before moving on to the next step.

- Location When selected a grid box opens showing where the panels are in relation to each other in the assembly. The user can also change locations from here by right clicking on the populated grid box for options. The grid box also contains the back side of the assembly if it is a double-sided assembly.
- Panel Search Allows the user to search for a panel by name and bypasses the navigation to the desired panel.
- Application This gives the designer the ability to select from the list of options including; Conventional, Expressway, Freeway, Minimum, or Oversized. The selections made upstream effect what's available downstream in the selection process of other options.
- **Panel Class** Panel Class is another way to shrink down the panels to choose from, it contains a big list of classes; Regulatory (R), Route Markers (M) and more, the letters in parenthesis designate the panel name. Example being Route Markers (M) = M1-7 panel name.
- × Add first panel Assembly Creation je, × × Assembly Panel Location: G F(0,0) Panel Search: 🔍 Application: Conventional Panel Class: Regulatory(R) Panel Name: Size: Q, State: All Panel Area: 0.00 ft <sup>2</sup> Add First Panel Tools & Total Area: 0.00 ft <sup>2</sup> Confirm Assembly Post User Settings FDOT.SIGNS A
- **Panel Name** With the previous selections made the list is culled down to the available panels and will populate with the panel name.
- Size The user can select the Search icon to select the available sizes that go with the panel selected, if a size is not preset you can enter in a custom size. An example entry being 24x36 which will equal 6 S.F. It is the designer's responsibility to know what size sign to use, do not assume this tool has the intelligence built in to determine the correct size to set for the sign panels of the project.
- State The user has 4 states to choose from; Proposed, Existing to Remain, Remove, and Relocate. The All button will force the state chosen to all panels in the assembly.
- **Panel Preview** When a panel is selected it displays a preview of how the panel(s) will look before placement.
- Add First Panel The user must select this button to add it to the assembly, if another panel needs to be added the user will repeat the previous steps to add it.
- **Confirm Assembly** When all panels have been added to the assembly and the user is ready to move on to the post options click on Confirm Assembly.

ASSEMBLY CREATION - POST

× × ×	Set post opti X	ons.	oly Cre
	Assembly	/	emt
	Panel		¥
	▼ Post		
	Post Search:	۹,	bels
	Installation:	Ground Mount 🔻	La
	Mounting:	Single or Multi-Post 🔹	
	State:	-	Ë
	Sign Type:	-	Setti
	Options:	-	s
	Pay Item:		100
SNS			ttings
T.SI(		Confirm post	r Set
FD0			Use
Ą			ŗ

- **Post Search** Allows user to search for a specific post which will avoid the pulldown navigation to choose the post.
- **Installation** The user selects which installation method to use. The following are available; Ground Mount, Panel Only, and Overhead.
- Mounting This allows the user to select the type of sign mounting, options being; Single or Multi-Post, Sign Beacon, Delineator, Highlighted Sign, Object Marker, Internally Illuminated Sign, Dynamic Message Sign Support Structure, or Electronic Display Sign.
- State There are several states available; Proposed, Existing to Remain, Relocate, Remove, and Proposed/Remove.
- Sign Type The options displayed to choose from is dependent on the type of State selected.
- Options This pull down gives the user ability to pick whether the sign is one sided, two sided, or single post or multiple posts. The options available are based on the previous selections made.
- Panel Custom Label Fields This is where to fill in any open fields on a sign panel. Example, the Speed Limit sign has one field that needs to be filled in. When the Speed Limit sign is selected Field 1 becomes active to enter the speed. This will change the preview display to show the new speed. If a sign is selected with more than one field in it the FDOT Signs tool will recognize this and the appropriate number of fields will become active.
- Pay Item This will show a preview of the post block used and the Pay Item information assigned.
- **Confirm Post** When selected the assembly is ready for placement and the tool moves to the placement process.

#### ASSEMBLY CREATION - PLACEMENT

X H X	Place panel(s) and po	ist.	ly Cre
~~~	Assembly		emp
	▶ Panel		Ass
	▶ Post		
	<ul> <li>Placement</li> </ul>		els
	Rotation Type:	Relative 🔻	Lab
	Rotation Angle:	0	
	Place on Alignment:		2
		Place Panel	Setti
		Place Post	ŝ
		Finish Assembly	100
FDOT.SIGNS			User Settings
A			

- **Rotation Type and Angle** There are two options for Rotation, Relative and Absolute, Relative allows the assembly to be rotated parallel to the roadway alignment and the flow of traffic, for this reason it is the default. Absolute allows the user to enter in a fixed rotation angle.
- **Place on Alignment** This toggle when on will place the assembly along an alignment with a Station, if toggled off it will be placed freely with no association to the alignment.
- Place Panel Starts the process of placing the assembly starting with the panel first.
- Place Post Starts the process of placing the post to go with the previously placed panel.
- **Finish Assembly** Once the assembly is placed this should be selected before moving on to the Label options.

<u>LABELS</u>

		_
×	▼ General Settings	reation
~	Add Shapes: 🖌 Group Labels:	embly C
	Arrow Direction: Left	Asse
	Text Style: FDOT	
	▼ Panel	
	Display Name: ☑ Display Size: ☑ Display State: □	Labels
	Layer: TextLabel 🔻	
	Spacing: 0.1	
	🕞 Place Panel Label	gs
	▼ Post	Settin
	Display Pay Item: 🗹 Display Station: 🗹 Display State: 🗌	Tools & S
	Layer: Payltem dp 🗸	
	Spacing: 0.1	
	🔞 Place Post Label	ttings
	<ul> <li>Save/Recall Label Settings</li> </ul>	er Se
		_ S
NS I	▼ 2	
NS.		
10		
Ξ		
A		

#### LABELS - GENERAL SETTINGS

- Add Shapes When toggled on, the Pay Item Number Label has a Rectangle shape and the Sign panel name has an Oval shape.
- Group Labels When toggled on, all labels are set as a group along with the panel.
- Arrow Direction The designer has an option to which way the label can be dragged off the object. Left means the arrow will remain pointing to the left and the label will move to the right. Right means the arrow will point to the right while the label will move left.
- Text Style Controls which font is used for the labels, default is set to FDOT.

#### LABELS - PANEL

- o Display Name Controls if the Panel name is part of the label or not.
- Display Size Controls if the Size of the panel is part of the label or not.
- **Display State** Controls if the state is labeled, default is proposed. If toggled on the "Existing to Remain" or "To Be Relocated" state will be part of the label.
- Layer Provides a layer override if needed, the default is TextLabel for Panel labels.
- **Spacing** Controls the vertical spacing between lines of text for the label, the default should be .10.
- Place Panel Label Executes the place panel label command, user picks the panel to label and then the location of the label.

#### LABELS - POST

- **Display Pay Item** Controls if the Post label contains the Pay Item Number.
- **Display Station** Controls if the Station location is part of the label or not.
- **Display State -** Controls if the state is labeled, default is proposed. If toggled on the "Existing to Remain" or "To Be Relocated" state will be part of the label.
- Layer Provides a layer override if needed, the default is PayItem\_dp for Panel labels.
- **Spacing -** Controls the vertical spacing between lines of text for the label, the default should be .10.
- **Place Post Label** Executes the place post label command, user picks the post to label and then the location of the label.

## FDOT MULTI-LINE

#### FDOT Multi-Line

FDOT Multi-Line Tool is located on the FDOT Ribbon in the Pay Item Tools Panel. This application aids the designer in drawing 2D Line work such as complete roadways including Curb and Gutter, Sidewalks, and striping for Signing & Pavement Marking plans if desired. The Application uses the Entity Manager database which will allow the user not only to select the correct pattern, but also have the correct pay item data attached. A brief overview of the application is below.





*Note* For more information on the FDOT Multi Line tool please reference the quick clip video accessible from hovering over the tool and pressing F1.

## **PAVEMENT MARKINGS**

💾 Pavement Markings

Pavement Marking Tool is located on the FDOT Ribbon in the Pay Item Tools Panel. This application aids the designer in drawing striping for Signing & Pavement Marking plans. The Application uses the Entity Manager database which will allow the user not only to select the correct pattern, but also have the correct pay item data attached. A brief overview of the three modes of the application is below. This tool can also be loaded from the **Command Line** by typing **pavmrktool.** 

## *Note* You have an option to select the pattern in EMX > Right Click > Select Place Pavement Marking. The pattern will load and is ready to place with the PM tool.

Striping Mode Select to browse through striping database	Justification - Center, Left, Right	
Additional pattern when selected	Pattern Inside  Enable Outsi / Distance Between 0.00	
Entity can be either Alignment or AutoCAD Entity	Outside Justification Center Reference Entity	Buffer Distance is measured
Begin or End	Draw Pattern Perpendicular to Entity Begin Point End Point End Point End Buffer	from the begin point to the first or last block
Station can be either selected in the Drawing or Stations typed in	Offset 0.00 Associate All nment (for Quantity Ta ff) Draw Stripes	
	Offset from Alignment or AutoCAD Entity	



*Note* For more information on the Pavement Markings tool please reference the quick clip video accessible from hovering over the tool and pressing F1.

## PLACE BLOCK GROUP

## Place Block Group

Place Block group is located on the FDOT Ribbon in the Pay Item Tools Panel, this application is used to place single or multiple blocks at once. An example being Reflective pavement markers or a multi part pavement message such as Right Turn Only. The pavement messages complete with Payitem data can be saved as an xml file for future use to save time in constructing them. The application accesses the same database as Entity Manager which means the blocks used are under influence of the payitem data. The Place Block Group tool can be loaded from the FDOT Civil 3D Ribbon on the **Pay Item Tools** panel. This tool can also be loaded from the **Command Line** by typing **blckgrp.** 

*Note* You have an option to select the pattern in EMX > Right Click > Select Place Block. The pattern will load and is ready to place with the PBG tool.

#### BLOCK GROUP TAB


#### LOCATION TAB



*Note* For detailed information please reference the quick clip video accessible from hovering over the tool and pressing F1.

# FDOT TRAFFIC PALETTE

The FDOT Ribbon loads when Civil 3D is loaded through the FDOT delivered icon. The FDOT State Kit, by default, opens in the Civil 3D workspace. The default visible Palette is the FDOT Subassemblies, to change the visible palette hover your mouse over the word TOOL PALETTES – FDOT SUBASSEMBLIES and Right Click. Select FDOT Traffic. Doing FDOT Traffic plan designs will utilize parts of this palette. A brief description of the tabs is shown below.



The figure below shows the FDOT Palette groups available. Once the user saves and exits Civil 3D the last visible palette used will display as the default.



The FDOT Traffic palette allows the designer to place blocks that already have Pay Item data attached, such as the mast arm assemblies, which are dynamic blocks meaning they have multiple blocks and pay item data depending on the assembly configuration. Using EMX alone for the mast arm placement would not give you the same result as the powerful dynamic blocks on the traffic palette.

```
Note For additional information on the use of any tool located on the FDOT Ribbon, hover your mouse over the designated tool and press F1. A help document will load and provide a brief description of the tool and a link directing the user to a quick clip video that will show a demonstration on how to use the tool.
```

# FDOT CIVIL BLOCKS

The FDOT Palette groups also contain a palette named FDOT Civil Blocks. These blocks when placed allow the designer to modify parameters such as curb types and dimensions that are controlled via constraints. The different curb options contain the pay item number pertaining to the selected curb type.



Once the user saves and exits Civil 3D the last visible palette used will display as the default the next time Civil 3D is launched.

- *Note* For additional information on the use of any tool located on the FDOT Ribbon, hover your mouse over the designated tool and press F1. A help document will load and provide a brief description of the tool and a link directing the user to a quick clip video that will show a demonstration on how to use the tool.
- *Note* Keep in mind when you close Civil 3D the program remembers the last palette group that was open, so you may need to change it back if needed.

# **3** WORKING WITH SHAPES

# **O**BJECTIVE

The objective of this chapter is to teach the student how to set up the design file that will contain shapes, such as sod and asphalt. The designer will use EMX for placement and label placement, along with adhoc additions. The designer will be exposed to the use of Sheet Layouts to mimic the use of different models in Microstation.

# INTRODUCTION

Creating and labeling shapes is a key component of being able to generate accurate quantities. The FDOT Civil 3D state kit is delivered with the latest Pay Item information based on the Basis of Estimates list of items. EMX reads the database list which allows the designer to place items with the correct symbology.

#### **Exercise 3.1** Setting up the design file

In this exercise you will data reference in one Alignment and Xref in one design file.

- 1. Open the *QTDSRD01.dwg* design file that was created in an earlier exercise.
- 2. Expand the Alignments folder in the Data Shortcut section, right click on SR61 and select Create Reference.

Data Shor	rtcuts [C:\e\projects' :es ments	\FDOT C3D Quantities\
	enterline Alignment	A Create Alignment Reference X
ot ete	BL98 SR61 Ifset Alignments	Source alignment: SR61
Cu	urb Return Alignme	Site:
Ra	il Alignments	Kone> V 🗂 🗸
< M	iscellaneous Alignr	Name:
Name	Source File Name	Description:
-b]SR61	јоb00	
		Alignment style: → FDOT Proposed ✓ 💽 ▼ 💽
		Alignment layer:
		CLConst_dp
		Alignment label set:
		OK Cancel Help

- 3. The Create Alignment Reference dialog opens, accept the default settings and select OK.
- 4. Type in Xref to open the Xref manager, Select the attach Dwg button on the upper left corner of the dialog.
- 5. Browse to the roadway folder and select the *DSGNRD01.dwg*.

ame: DSGNRD01	∼ Brow	se
Preview	Scale Specify On-screen X: 1.00	Path type Relative path
	Y: 1.00 Z: 1.00 Uniform Scale	Rotation Specify On-screen Angle: 0
Reference Type ) Attachment	Specify On-screen           X:         0.00           Y:         0.00           Z:         0.00	Block Unit Unit: Unitless Factor: 1
Locate using Geographic Data	0.00	

- 6. Make sure you set reference type to Overlay. Untoggle all other boxes as shown above.
- 7. Select OK.
- 8. Type **ZE** for Zoom Extents, or double click your mouse wheel to see the references.
- 9. Save your drawing and leave open to continue for the next exercise.



#### **Exercise 3.2** Create a Project Specific database

In this exercise, Entity Manager will be used to create a project specific database. A project specific database gives the designer the capability to modify database items for their specific project, if necessary, providing flexibility and

advantages in production, multi-designer/discipline usage and project to project portability for common District/job related items.

- 1. Continue using the QTDSRD01.dwg for this exercise.
- 2. Open the file *C:\e\projects\22049555201\roadway\***Qtdsrd01.dwg.** (This is the main design file for all Shapes and area calculations.)
- 3. From the *FDOT Ribbon*, select the **Entity Manager** icon. If this your first time launching EMX it will ask if you want to see the details as it builds a project specific file, click **No** to save time.



When the file is ready a Save As dialog box opens. Browse to the *Symb* folder in your project, rename the file as **22049555201.xml** and click **OK**.

*Note* You can also click in the Database location bar on the top of EMX to browse to another project location or to open this payitem file.

#### **Exercise 3.3** Creating Pavement Shapes and Sheet Layouts as Models

In this exercise, the designer will insert a block representing the pavement shapes and hatch them with the appropriate pavement type, then the layouts will be renamed and copied so as the desired pavement type is visible only. The block also contains a sidewalk shape. You will also be introduced to using Layout Tabs as models.

#### Inserting Pavement Shape Block (Part 1)

1. Open or continue in the *QTDSRD01.dwg* file.



- 2. Type I for insert, or you can click on the Insert button on the Insert Ribbon
- 3. Browse to the Roadway folder of your project and select the *Shape Boundaries* drawing.
- 4. In the insert dialog toggle on **Explode**, and match diagram below.

A Inse	ert			×							
Name:	Shape Boundaries V Browse										
Path:	Path: C:\e\projects\FDOT C3D Quantities\FDOT C3D Quantities Complete\22049555201\roadway\Shape Boundaries.dwg										
Loc	ate using Geographic Da	ata									
Insertio	on point ecify On-screen	Scale	Rotation Specify On-screen								
<b>X</b> :	0	X: 1	Angle: 0								
<b>Y</b> :	0	Y: 1	Block Unit								
Z:	0	Z: 1	Unit: Unitless	$)/\sim$							
		✓ Uniform Scale	Factor: 1	4							
Explo	ode		ОК	Cancel Help							

- 5. Select OK
- 6. Your drawing should look like image below.



#### Hatching Pavement Shapes (Part 2)

- 1. Open EMX if not already open, make sure the database location is correct. It should reside in your Calculations folder within your project.
- 2. Click on the default Layout1 tab on the bottom of the screen next to model.
- 3. Type in **Viewport** on the command line then press enter to make it the current layer.
- 4. On the Layout Tools Ribbon, select the **Rectangle** view port option.
- 5. Select the viewport and pick the Triangle grip, select the **1"=40**' scale.
- 6. Double click in the viewport to make it active, type **RE** to regenerate the screen to make the text look correct (this is the annotative text adjusting to the scale).
  - Selected viewports are not locked

You can always grip

8. Turn on Selection Cycling if not already on.

7. Select the lock icon, which will lock the view port in place,

edit the viewport itself to make it bigger or smaller.

- 9. Right Click on isolate objects and select Isolate Objects along the bottom of your screen.
- 10. Select the boundary representing the pavement and pick the **Red Polyline** in the Selection dialog.



- 11. Press **Enter.** Notice the only objects visible is the Red Pavement boundary representing the pavement Base.
- 12. On EMX in the Pay Item Search box, type in 0285706.

Payltem	Description	Layer
Optional Base	Roadway Design\Quantity Features\Base\Optional	
0285701	Optional Base, Base Group 01	PavtBase
🗑 0285702	Optional Base, Base Group 02	PavtBase
0285703	Optional Base, Base Group 03	PavtBase
0285704	Optional Base, Base Group 04	PavtBase
0285705	Optional Base, Base Group 05	PavtBase
0285706	Optional Base, Base Group 06	PavtBase
m		

Since this is the only Alignment we have referenced in, EMX will by default associate all entities to the **SR61** Alignment. If there were multiple alignments you would have to set the desired alignment current in EMX before placing Pay Item Entities.

- 13. Select the Label Tag Button. Non EMX.
- 14. Toggle on the **Auto-Layer** option, this will place the labels on the same layer as the hatch. You will see the advantage of this later in this section. Select **Exit** to close the Hatch Area Labels dialog.
- 15. Select the fill region with hatch button. 4, with the pick inside boundary option active, left click inside the boundary.
- 16. The boundary is flooded with red, press enter to see the label. Place the label off to the right as shown below.



17. Right Click on Isolate Objects and select End Object Isolation



- 18. If you hover over the newly placed hatching it shows the following.
  - Pay Item Optional Base, Base Group 06 (0285706) Category Optional Base Align SR61 Layer PaxtBase Handle 4049928 Area 14227 SY
- 19. Right Click on the Layout1 layout and rename it to Pavement Base
- 20. Right Click on the newly renamed Pavement Base Layout and select Move or Copy.

Move or Copy...

- 21. Toggle on Create a copy and double click (move to end).
- 22. Right Click the copied layout and rename it *Super Pave*. Double click in the view port to make it active. Make sure the viewport is locked (Lock icon is Blue)



- 23. Select the freeze button Freeze and select the red pavement base hatch you just placed.
- 24. Select the Isolate Objects button and select the white polyline, which represents the Super pave asphalt layer.
- 25. In EMX search, type in pay item number 0334 1 52.

0334 1 52 Superpave Asphaltic Concrete, Traffic B, PG 76-22 PavtAsphalt

- 26. Select the Fill region with hatch button, a adhoc dialog opens, change the thickness to **1.5** representing 1.5" thickness of pavement. Select Ok to continue.
- 27. Pick the inside of the Pavement Boundary, press enter to place the label. Place the label to the right as before.
- 28. Unisolate Objects to turn all layers back on.
- 29. Repeating the same process as above copy the layout and rename it **Friction Course** the polyline color is yellow; the pay item number is **0337 7 25**.
- 30. When complete switch back to the model tab and grip edit the location of the labels as shown below.



31. Click on the **Pavement Base** tab, you will need to freeze the Friction Course and Super Pave layer. Click on the **freeze** icon and select the Yellow and White label, this will turn off the label along with the associated hatch. This is why the auto layer option in the label dialog is important.



- 32. Switch to the **Super Pave** tab and **freeze** the yellow (Friction Course Label). The Friction course tab should already be set with the other 2 pavement layers turned off.
- 33. Switch between the Tabs now, notice how only the desired pavement layers are displayed in the model.
- 34. Save your file before continuing.

#### AUTODESK A360 DRIVE

You can upload this file to your built in A360 account so contractors or construction can view the model without having to have Civil 3D installed. A360 is a cloud based storage, which means the drawing file can be accessed from any location using a browser. The drawing can be viewed, shared or downloaded.

A360 DRIVE •		c	٤.	e 🚇
FILES RECENT ACTIVITY TRASH			Upload	New Folder
Show: All files 🗸				98.3 MB of 25.0 GB used
Name 🔺	Owner	Туре	Size	Last updated
CTDSRD01.dwg	Randy Roberts	dwg	3.7 MB	Just recently
Automatic Copy	Randy Roberts	Folder		Dec 11, 2014
ALGNRD01.dwg	Randy Roberts	dwg	3.5 MB	Aug 21, 2017
DSGNRD01_Backup.dwg	Randy Roberts	dwg	3.7 MB	Aug 21, 2017
MODLRD01_Proposed_Backup.dwg	Randy Roberts	dwg	12.8 MB	Apr 26, 2017
MODLRD01_Proposed_Backup_Promote.dwg	Randy Roberts	dwg	14.3 MB	Aug 21, 2017

The same sheet layout tabs are available and behave like they do in the drawing file you just created.



#### **Exercise 3.4** Creating Sidewalk Shape

In this exercise, the designer will apply a hatch with Pay Item data to the sidewalk shape and create a separate layout for easy visibility.

- 1. Continuing in the *QTDSRD01.dwg* file. Right Click on the Friction Course layout and create a copy moving it to the end. Refer to the previous exercise for help on this step if needed.
- 2. Right Click on the new copy and **rename** it *Sidewalk*.
- 3. Double Click inside view port to make it active.
- 4. Freeze the Friction Course Layer by clicking on the yellow label.
- 5. Select the **Isolate Objects** command to show only the Sidewalk shapes.
- 6. In EMX type in the pay item search box **0522 1** for a 4" thick sidewalk.
- 7. Make sure the Auto Label option is selected in the label style first and then Select the Fill Region with hatch icon.
- 8. The command line has options for selection type, type **S** for select object, this is because the boundary is too small to pick the inside of the object.
- 9. Select the sidewalk on one side only first and press enter, place the label to the outside of the sidewalk.
- 10. Select the other sidewalk boundary and place the label on the outside of the sidewalk.
- *Note* It is important to only select or pick one closed boundary at a time to hatch and label. Even though you have the capability to hatch more than one boundary at a time there will only be one label placed for all of them, which means only one area id that will show up in the report. The rule of thumb is one area id for one hatched boundary.
- 11. Select Unisolate Objects to turn other layers back on. Your drawing should look like image below.
- 12. Save your file.



## Exercise 3.5 Creating Sod/Turf Shapes

#### > Hatching an Internal Island (Part 1)

In this exercise, the designer will place shapes for sod in the design file, along with labels. Different techniques will be used for this exercise.

- 1. Continue working in the *QTDSRD01.dwg*.
- 2. Using previous steps in this chapter, copy and rename the Sidewalk layout to Sod.
- 3. Make sure the Viewport scale is still at **1"=40**' and is locked.
- 4. Freeze the Alignment Layer, don't worry about the Tick marks and the station values.
- 5. Freeze the Sidewalk Layer.
- 6. Open EMX if not already open and type in the Pay item search box 0570 1 1 for Performance Turf.
- 7. Click the Fill Region Icon on EMX 👪
- 8. Make sure pick internal point is noted on the command line and select inside the grassed median of the roadway. Press enter to move and place the label to the side. Your drawing should look like below.



9. Hovering over the hatch reveals Pay Item x data. If you don't see the truck symbol, then there is no Pay Item data attached.



#### > Creating and Hatching a Boundary (Part 2)

- 1. Select the Offset Command on the Home Ribbon  $\stackrel{@}{=}$  .
- 2. For offset distance enter **8**.
- 3. For object select the back of sidewalk on both sides of the road.



4. Near the intersection draw a line from the endpoint of the offset line to the back of sidewalk end points as shown on both sides of the road.



5. Do the same step at the other end, near station 714+20.



6. With a boundary created, select the fill region icon and select the southern sod boundary along the road, press enter and place the label to the southern side.

*Note* You will have to zoom out until you see the entire boundary before it will hatch if you are using the pick internal point option.

7. The Arrow head is automatically placed in the centroid of the shape, select it and move it by its grip to the shape so it makes more sense. Keep in mind that the leader line will interact with any new hatching, so try to keep it from crossing a shape.



8. Select the *Performance Turf, Sod* Pay Item **0570 1 2** and select the northern side of the road.

You should now have 3 areas hatched with Sod.



- 9. Save the file.
- 10. Using what you have learned earlier, go through the named layouts and freeze shapes that do not pertain to the layout title. Since you have the Auto Layer option turned on for labeling, just select the label to freeze both the hatch and label.
- 11. Save the QTDSRD01.dwg file before continuing.

Keep in mind anything crossing a boundary you want to hatch will interact with it and cause you to have multiple regions instead of one, such as a label leader line or other line work. It is a good practice to examine the area to hatch before starting the process, so you can move leaders or freeze unnecessary layers. Once the hatch is placed and labeled no new or existing linework will interact with the region

### **Exercise 3.6** Working with Shapes in EMX

In this exercise, the designer will learn how to utilize the tools available in EMX to locate and zoom to shapes based on their area id. The Area id is a unique value that AutoCAD assigns to every object drawn or placed in a drawing file to AutoCAD it is called a handle, it is how AutoCAD keeps track of every object that is in the drawing. If an object is deleted and redrawn it is assigned a new handle from the program. EMX picks up that handle and uses it to identify the shape hatch as an area id. And makes it a part of the shape label.

- 1. Continue working in the *qtdsrd01.dwg*.
- 2. Open EMX if not already open.
- 3. In EMX switch to the Alignments tab.

4. Expand the Alignment **SR61** folder, each alignment that resides in any drawing file will be listed here. If a new alignment is either created or referenced in you can click on the update button to refresh the list.

y ltem Categ	ories	Entity XData	Selected	Alignments	
lect an align: ritten to XDa	iment ta on e	name to asso each Placemer	ciate with t nt or Entity	he pay item d Edit action.	ata attached to each entity. The alignment name will be
lignment	SR61			~	2
⊡ C:\e\p	roject	s\FDOT C3D C	Quantities\F	DOT C3D Qua	ntities Complete\22049555201\roadway\QTDSRD01.dwg
ia · "⊒> SR	51				
🖳	ID 404	4BFC3 ( 1135 S	SY)		
🙀	ID 404	4B292 ( 1186 S	Y)		
🗛	ID 404	4A61F ( 1408 S	Y)		
🔤	ID 404	49AD9 ( 622 S\	0		
🔤	ID 404	49AD1 ( 591 S)	0		
🔯	ID 404	499D0 ( 14161	SY)		
🔤	ID 404	49984 ( 14161 :	SY)		
	ID 404	49928 ( 14227 )	SY)		

- 5. Move EMX so you can see the drawing area, left click on different area id's, notice how the drawing zooms to the selected id, this is useful with many small shapes that are hard to find in the drawing screen.
- 6. Save and Close the *qtdsrd01.dwg* file.

You will see later when we run shape reports, such as sod that the area id in the report can then be identified here in EMX and can be zoomed to by just a click.

# **4** WORKING WITH LINEAR ENTITIES

# **O**BJECTIVE

The objective of this chapter is to teach the student how to set up the design file that will contain linear entities, such as curb, guard rail, traffic separators, etc. The designer will use EMX for placement and to append data to already placed linework, along with adhoc additions.

## INTRODUCTION

This chapter covers Linear entities that are either already placed or need to be placed in the design drawing file. The entities that are already placed will either have the pay item data (Xdata) attached or will need the Xdata to be attached using EMX. Using the EMX drawing tools the designer can draw linework with the xdata attached and have confidence it is on the correct layer and using the correct linetype, using the append function in EMX will force the target linetype to take on all of the settings of the selection you make in EMX, in other words it will change a linetype, layer, color (Symbology) to the FDOT standard along with the appropriate Xdata that will then QC and also Quantify in reports. For detailed information on EMX refer to Chapter 2.

The advantage of Civil 3D is some of the Linework will come from the Corridor Model in the form of Feature Lines, which are either 3D or 2D. The roadway designer should keep this in mind when the model is complete, that the linework should be Extracted for use with quantities.

#### **Exercise 4.1** Drawing New Guardrail and Appending to Existing Guardrail

#### > Drawing New Guardrail (Part 1)

In this exercise, the designer will draw new Guardrail linework using the EMX drawing tools utilizing different techniques.

- 1. Open the FDOT Civil 3D State Kit or continue if already open.
- 2. Open the dsgnrd01.dwg located in the Roadway folder of your project.
- 3. Next you will insert a block that contains already drawn Linear entities, Type I for insert and browse to the file named *Linear Entities.dwg* located in the Roadway folder.
- 4. Make sure Explode is toggled on, match dialog box below and press OK.

A Insert		×
Name: Linear Entities		✓ <u>B</u> rowse
Path: C:\e\projects\FDOT C	3D Quantities\FDOT C3D Quanti	ties Complete\22049555201\roadway\Linear Entities.dwg
Locate using <u>G</u> eographic E	Data	
Insertion point	Scale Sp <u>e</u> cify On-screen	Rotation Spe <u>c</u> ify On-screen
<u>X</u> : 0	<u>X</u> : 1	Angle: 0
<u>Υ</u> : 0	<u> </u> 上 1	Block Unit
<u>Z</u> : 0	⊒: 1	Unit: Unitless
	<u> U</u> niform Scale	Factor: 1
✓ Explode		OK Cancel <u>H</u> elp

- 5. Open EMX and make sure the project database is set to your *Symb* folder in your project.
- 6. On EMX left click in the Pay Item to find search box and type in Pay Item number **0536 1 0** which is Guardrail, Roadway TL-2.
- 7. Select the Guardrail, Roadway TL-2 (Left).
- 8. Zoom into Station 706+00, you will be adding Guardrail behind the sidewalk along the curve.
- 9. With the selection still highlighted in EMX, select the **Offset** command from the EMX drawing tools.
- 10. For distance type in 1, Select the Back of sidewalk (Green Line) along the curve, for side select behind the sidewalk. Your drawing should look like below.



11. Save the drawing before continuing.

#### > Appending Xdata to already placed Guardrail (Part 2)

- 1. Continue working in the *dsgnrd01.dwg*.
- 2. Zoom to near the intersection, you will append Xdata to the guardrail that starts at station 701+00 and wraps around the curb return on the North side of the roadway.
- 3. Before you append the Xdata to it, hover over the guardrail and notice its attributes.



4. Make sure the 0536 1 0 Guardrail, Roadway TL-2 (Left) is still selected in EMX

- 5. Select the **Append** button em on EMX.
- 6. Select the Guardrail and press enter.
- 7. Now hover over the Guardrail and look at the new attributes attached including the Pay Item data.



- 8. Continue appending the same Xdata to the next segment of Guardrail.
- 9. Save the drawing.
- 10. In EMX change the selection to the (Right) guardrail.

🗑 0536 1 0 Guardrail, Roadway TL-2 (Right)

- 11. Using the previous steps append the Xdata to the remaining Guardrail on the South side of the roadway.
- 12. Save the drawing before continuing.

#### **Exercise 4.2** Drawing and Appending Xdata to Traffic Separators

#### > Drawing Traffic Separator with Xdata (Part 1)

In this exercise, the designer will draw linework representing a traffic separator in the first part and then append xdata to an already placed segment.

- 1. Continue working in the *dsgnrd01.dwg* file.
- 2. In EMX type in Pay Item number 0520 5 11 representing

0520 5 11 Traffic Separator, Concrete, Type I, 4' wide

3. Using the EMX drawing tools, select the polyline command.



4. Using the image below as a guide draw the line.



- Chapter 4
  - 5. With your CENter osnap active pick the center of circle 1 and draw a line to the center of circle 2, then to circle 3 and 4. Do not close the polyline from circle 4 to 1.
  - 6. Zoom into the nose of the separator and select the line you drew, hover over the middle grip and select **Convert to Arc.**



- 7. Using the NEArest osnap snap anywhere along the arc.
- 8. Erase the 4 temporary circles.
- 9. Save the drawing before continuing.

#### > Appending Xdata to Traffic Separator (Part 2)

In this part of the exercise the designer will append the appropriate Xdata to an already placed traffic separator linework.

- 1. Continuing in the *dsgnrd01.dwg* file, zoom to the other side of the median to the other traffic separator location.
- 2. In EMX with the 0520 5 11 pay item selected, select the Append button
- 3. Select all three segments and press enter.
- 4. Hover over the newly appended linework to see if the Xdata attributes are present.



*Hint* You can always tell if an entity has Xdata attached by the truck symbol that is present when hovering over an object.

5. Save your file.

#### **Exercise 4.3** Appending Xdata to Curb and Gutter

In this exercise, the designer will append xdata to the curb face all at once, using EMX.

- 1. Continue working in the *dsgnrd01.dwg* file.
- 2. Open EMX if not already open.

- 3. In the Pay Item Number search box type in **0520 1 7** for Type E Curb & Gutter.
- 4. Select the Isolate button  $\stackrel{\boxtimes}{\longrightarrow}$  located on the Layers panel.
- 5. Select a Face of Curb line and press enter.
- 6. Notice the only layer that is visible is the Face of Curb.
- 7. On EMX click on the Append button 🚟.
- 8. Up to this point you have appended xdata to one object at a time, now left click your mouse and window the entire selection of visible curb and press enter.
- 9. Hover over the curb face and check its attributes.

	ş	8	
	3	Pay Item	Concrete Curb & Gutter. Type E (0520 1 7)
$\setminus$		Category	Curb & Gutter, Curb, Gutter
		Align	SR61
		Layer	CurbFace
		Handle	2042385
	$\mathbf{N}$	Area	14969 SY
		Length	1286 FT

- 10. Press the Un isolate button  $\stackrel{\text{$\swarrow$}}{\Longrightarrow}$  to return to the previous layers visible.
- 11. Save the file before continuing.

#### **Exercise 4.4** Associating an Alignment to Entities

In this exercise, the designer will associate the correct alignment that EMX uses before appending Xdata to a Guardrail, although there is only one default alignment in this file the steps are the same and the designer will need to be aware of this scenario.

- 1. Continuing in the *dsgnrd01.dwg* file.
- 2. In EMX switch to the Alignments tab.

	رد بې د.				Quantities complete (220 155520 1 (551110 (220 155520 1/m)))
Pay Item Cate	gories	Entity XData	Selected	Alignments	i la
Select an alig written to XD	inment ata on i	name to assoc each Placemen	iate with t t or Entity	he pay item d Edit action.	data attached to each entity. The alignment name will be
Alignment	SR61			~	
⊡∰ C:\e\ '∰ SI	project R61	s\FDOT C3D Q	uantities\F	DOT C3D Qua	antities Complete\22049555201\roadway\DSGNRD01.dwg

Currently the Alignment that is listed is correct, since it is the only one in the file. If there where multiple alignments in the design file they would be listed in alpha numeric order, meaning that you would have to set it. You can either use the pull down or the selection box to pick the alignments.

- 3. With the Alignment correct, switch back to the Pay Item Categories tab.
- 4. Click on the id button id along the top of EMX.

*Note* Utilizing tools such as Isolate and Un isolate can make selection processes a breeze. If not doing so already try to incorporate some of these tips into your everyday usage of Civil 3D.

5. Pick the Guardrail as shown below at the intersection and press enter.



6. The correct guardrail is now current, this is a shortcut to quickly get to the desired entity without searching or browsing to.

; Favorites •	ext fliter Y + Pay item to find 00			
Payltem	Description	Layer	Block	Compute
Guardrail	Roadway Design\Plan Features\Guardrail\Guardrail			
B 0536 1 0	Guardrail, Roadway, General/Low Speed TL-2	GuardrailLt		LF=IF(LF>
🗑 0536 1 0	Guardrail, Roadway TL-2 (Left)	GuardrailLt		LF=IF(LF>
🗑 0536 1 0	Guardrail, Roadway TL-2 (Right)	GuardrailRt		LF=IF(LF>
8 0536 1 1	Guardrail, Roadway, General TL-3	GuardrailLt		LF=IF(LF>

- 7. Select the Append button and select the Guardrail behind the sidewalk on the Curb Return.
- 8. Hover over the Guardrail to make sure it has the correct Xdata and Alignment listed.



9. Save file before continuing.

#### Exercise 4.5 Using EMX Offset command

In this exercise, the designer will use the offset feature in EMX to offset a front of sidewalk to create the back of sidewalk. The advantage of using the offset feature it automatically puts the offset linework on the correct layer with correct xdata, regardless of what the source lines symbology is.

- 1. Continuing in the *dsgnrd01.dwg* file.
- 2. Zoom to the highlighted area shown in the image below.



- 3. Open EMX if not open, in the text filter search box, type in sidewalk.
- 4. Left click in the 4" thick sidewalk, Pay item number 0522 1.

0522 1	Sidewalk Concrete, 4" Thick		SidewalkConc
• -			
		~	

- 5. Select the Offset command in the EMX drawing tools
- 6. Notice the command line is seeking input, it now behaves identically to the AutoCAD offset function.

   Image: OFFSET Specify offset distance or [Through Erase Layer] <Through>:
- 7. Enter in 5 to offset the first sidewalk line 5'.
- 8. Select the sidewalk line as shown and left click behind the line.



9. Let's compare the data on the two lines, notice they are on separate layers, this is because EMX assigns the correct symbology of the selection you made.



10. Save file before continuing.

#### **Exercise 4.6** Using EMX Match Properties command

In this exercise, the designer will use the Match Properties command in EMX to copy from a source line and assign selected symbology to a target line. The new linework will then assume the layer, line type, color, and Xdata of the source line work. There are two arcs offset 3 feet behind the sidewalk at the driveway entrance in the same area as the previous exercise that will need to be converted to guardrail.

- 1. Continuing in the *dsgnrd01.dwg* file.
- 2. Zoom to the highlighted area shown in the image below.



- 3. Open EMX if not already open.
- 4. Select the Match Properties icon along the top of the EMX dialog box  $\square$ .
- 5. Using the image below select the guardrail line where the 1 is located, this is your source line.



- 6. Following the image select your two arcs, then press enter.
- 7. Your drawing should look like image below.

Notice all the information that was added to the new guardrail. You can think of the match properties command as a copy and paste for cad entities.





8. Save and close file.

# **5** DRAINAGE NETWORKS

# **O**BJECTIVE

The objective of this chapter is to teach the designer additional steps that are required for certain drainage parts to quantify correctly. The designer will get a basic understanding on how drainage parts are set up in the FDOT Civil 3D State Kit with Pay Item Numbers already attached, which allows the designer to layout the drainage network and not have to worry about attaching Pay Item Information except for End Walls/Sections. The Pay Item information for all other pipes and structures are built into the FDOT Drainage parts list.

# INTRODUCTION

A brief overview of Drainage Parts and Networks is included in this chapter. The reason that EMX is needed to add additional Xdata is due to adhocs that a part of EMX. Using a Mitered End Section as an example, it not only contains the pay item number for the structure itself, it also contains a predetermined amount of sod based on the size of the structure. In EMX if you right click on the structure and select Edit Pay Item Data the *Edit Pay Item Attributes/Adhocs* dialog box opens.



The Attributes tab shows general information about the symbology of the structure. The Adhocs tab displays the additional Sod quantity that must be appended to the structure, so it can be quantified. The reason being that even though a drainage part can have multiple pay item numbers, it can only have one compute method or formula attached. In the case of the extra sod quantity which doesn't contain a formula, just a set Square Yardage amount

🔺 Edit Pay Item A	ttributes/Adhocs - 0430982125	Х 🛛 🖪 Е	dit Pay Item Attı	ributes/Adhocs -	0430982125	i	>
Attributes Adhocs		Attribu	ites Adhocs				
Pay Item ID	0430982125		Name	Туре	Locked	Value	
Description	MEC Onlined David 10" CD 1.4 1 Dav	•	0570 1 2	Unit	~ 🗹	SY	
Description	MES, Optional Round, 18 CD, 1.4, 1 Pipe		0570 1 2	Quantity	~ 🗹	25	
Compute Method	EA=IF(EA>0,EA*QF,(element_count)*QF)		0570 1 2	String	~ 🗹	Performance Turf, Sod	
Layer	MES		0430982125	Unit	~ 🗹	EA	
Block	MESC18RCP4S		DESIGN N	String	~ 🗆		
Block Scale	1.000000		SORTBY	String	~ 🗆		
Block Library	dplan.dwg	•			~		
Quantity Factor	1.00000         QF value in Adhocs takes precedence.						
	🛃 OK Cancel					🛃 ОК С	ancel

This issue is not limited to just Sod, some structures have Steel and Sod amounts as adhocs. It is good practice to keep this in mind when laying out a network to append the appropriate EMX part to the actual Civil 3D part, this in no way

effects the 3D drainage part or changes any drainage information that already exists. It simply adds additional attributes that can be read by Takeoff Manager. If you run a report and it shows 0 qty for sod that is an indicator that the adhoc data has not been applied.

### DRAINAGE COMPONENTS

Pipe Network catalogs (\*.*xml*) - The Pipe Network catalogs is utilized for numerous projects, as it contains the standards for an entire organization. The Department provides Pipe Network catalogs as part of the FDOT Civil 3D State Kit.

Civil 3D organizes the components of a drainage system according to their spatial characteristics. Spatial information is stored as *Structures, Pipes* and *Pipe Networks*.

- Structures: Structure (inlets, manholes, end sections, etc.)
- **Pipes:** Pipes represents a linear feature depicting a path connecting two structures, traversing upstream to downstream. The path may be straight line or curvilinear (along a graphic element).
- **Pipe Networks**: A network is a system of interconnected structures and pipes that form a system through which water can flow to a single outlet. A drainage project using civil 3d can accommodate any number of Pipe Networks.

## HOW THE PARTS CATALOG WORKS

When pipe networks are created or edited, Civil 3D references the parts catalog for information about each part (pipe or structure).

The FDOT Civil 3D State Kit installs the default pipe network parts catalog at:

C:\FDOT20xx.C3D\Data\Pipes Catalog.

### **DRAINAGE PART LIST INFORMATION**

The FDOT Drainage parts list resides in the fdotmaster.dwt template that is used every time a design file is created using the Create File application. The path to the parts list is already set when you open Civil 3d using the FDOT State Kit icon.

#### INFORMATION TAB:

Use this tab to view or change general information for the pipe network parts list. The Name specifies the name of the current parts list. The Description specifies the description for the current parts list.

Network Parts List - FDOT Drainage						
ormation Pipes Structures Summary						
lame:		Created by:	Da	te created:		
FDOT Drainage		RD964RR	3	/19/2015 10:20:	:44 AM	
Description:		Last modified by:	Da	te modified:		
Proposed Drainage Parts for FDOT Drainage Projects	$\sim$	ps972rr	2	/27/2017 5:11:4	16 PM	
	$\vee$					
		OK	Cancel	Apply	н	elp

#### PIPES TAB:

Inside the Parts list there are several styles that reside controlling the appearance of the parts to match FDOT standards. The image below shows what is contained within the Pipes tab of the parts list.

Network Parts List - FDOT Drainage					)
formation Pipes Structures Summary					
Name	Style	Rules	Render Mater	Pay Item	
FDOT Drainage					
😥 🗁 Box Culvert Concrete Pipe	Ę	Ę	Ę		â
🕀 🗁 Vertical Elliptical Concrete Pipe	Ę	Ę	Ę		5
🕀 🗁 Horizontal Elliptical Concrete Pipe	Ę	Ę	Ę		ą
🕀 🍺 Utility Duct	Ę	Ę	Ę		5
🕀 🗁 Pipe Culvert S/CD	ę	Ę	Ę		5
🕀 🗁 Pipe Culvert SD	Ę	Ę	Ę		5
🕀 🗁 Pipe Culvert Gutter Drain	Ę	Ę	Ę		Ð
<					
	OK	Cance	l Apply	He	elp

You can add new pipe sizes to the parts list or remove pipe sizes from the parts list. Each size selection matches a part size from an FDOT part family in the part catalog. Optional properties may also be set on the part size. The combined set of selected and optional properties is assigned to the pipe when it is inserted into the drawing.

- **Name:** This tree view displays the name of the FDOT parts list at the top level, and then the names of the FDOT part families included in the parts list, and then the names of the part sizes included in each part family. Note when a new size is added to the parts list, it is assigned a default unique name. The size name can be edited (renamed) to any unique name within the part family size list.
- **Style:** Specifies the default FDOT style assigned to the pipe when it is inserted into the drawing. Select an FDOT part family and click the Select All Edit icon to assign the selected FDOT style to all part sizes within that family.
- **Rules:** Specifies the default rules assigned to the pipe when it is inserted into the drawing. Select an FDOT part family and click the Select All Edit icon to assign the selected style to all part sizes within that family.

- **Render Material:** Specifies the default render material assigned to the pipe when it is inserted into the drawing. Select an FDOT part family and click the Select All Edit icon to assign the selected style to all part sizes within that family.
- **Pay Item:** Specifies the FDOT pay item ID assigned. Select a part family, or a part size within a FDOT part family, and then click to view the already assigned pay item to all part sizes within that family, or to an individual part size within that family.

Click on the + sign to the left of FDOT Drainage style to expand the list Pipe families.

normauori	Pipes	Structures	Summary										
Name					Style		Ru	les		Render	Mater	Pay Item	_
÷- 0	🛃 Pipe	Culvert S/C	D			l	2		Ę		ę		Ę
	5	12" S/CD PI	PE CULVERT,	OPT	FDOT D	Orai 🤉	🔏 FDC	OT Pipes	G	ByLayer	۲	0430175112	Ę
	···· 🜮	15'' S/CD PII	PE CULVERT,	OPT	FDOT D	Orai 0	🔓 FDC	OT Pipes	9	ByLayer	۲	0430175115	Ę
	0	18'' S/CD PI	PE CULVERT,	OPT	FDOT D	Orai (	🔏 FDC	OT Pipes	9	ByLayer	۲	0430175118	Ę
	6	24'' S/CD PI	PE CULVERT,	OPT	FDOT D	Orai @	🔏 FDC	OT Pipes	B	ByLayer	۲	0430175124	Ę
	··· 🜮	30'' S/CD PII	PE CULVERT,	OPT	FDOT D	Orai 0	🔓 FDC	OT Pipes	9	ByLayer	۲	0430175130	Ę
	0	36'' S/CD PI	PE CULVERT,	OPT	FDOT D	Orai (	🔏 FDC	OT Pipes	9	ByLayer	۲	0430175136	ł
	60	42'' S/CD PI	PE CULVERT,	OPT	FDOT D	Orai 🤉	🔏 FDC	OT Pipes	G	ByLayer	۲	0430175142	ł
	60	48'' S/CD PII	PE CULVERT,	OPT	FDOT D	Orai 0	🔓 FDC	OT Pipes	9	ByLayer	۲	0430175148	Ę
	6	54'' S/CD PI	PE CULVERT,	OPT	FDOT D	Drai 0	🔓 FDC	OT Pipes	9	ByLayer	۲	0430175154	5
	60	60'' S/CD PI	PE CULVERT,	OPT	FDOT D	Orai 🤉	🔏 FDC	OT Pipes	G	ByLayer	۲	0430175160	ł
	60	66'' S/CD PII	PE CULVERT,	OPT	FDOT D	Orai 0	🔓 FDC	OT Pipes	9	ByLayer	۲	0430175166	Ę
	0	72'' S/CD PI	PE CULVERT,	OPT	FDOT D	Orai (	🔏 FDC	OT Pipes	9	ByLayer	۲	0430175172	ł
		78'' S/CD PI	PE CULVERT,	OPT	FDOT D	Orai @	🔏 FDC	OT Pipes	B	ByLayer	۲	0430175178	ş
	Ø	84'' S/CD PII	PE CULVERT,	OPT	FDOT D	Orai 0	🔓 FDC	OT Pipes	9	ByLayer	۲	0430175184	Ę
	- n:	C 1 1 CD				6					1	1	ę

Click on the + sign to the left of Pipe Culvert S/CD family to expand the list and display Round Pipe sizes.

Network Parts List - PUOI Drainage		
ormation Pipes Structures Summary		
Name		_
⊞- 😭 🔽 FDOT Drainage		
		 _

#### STRUCTURES TAB:

The Structure tab contains all the Structure families added from the Structure catalog: FDOT Imperial Structure Catalog. Use this tab to view or change the FDOT structure sizes included in the parts list.

You can add new FDOT structure sizes to the parts list or remove structure sizes from the parts list. Each size selection matches a part size from a part family in the part catalog. Optional properties may also be set on the part size. The combined set of selected and optional properties is assigned to the structure when it is inserted into the drawing.

- **Name:** This tree view displays the name of the FDOT parts list at the top level, and then the names of the FDOT part families included in the parts list, and then the names of the part sizes included in each part family. Note when a new size is added to the parts list, it is assigned a default unique name. The size name can be edited (renamed) to any unique name within the part family size list.
- **Style:** Specifies the default FDOT style assigned to the structure when it is inserted into the drawing. Select an FDOT part family and click the Select All Edit icon to assign the selected style to all part sizes within that family.
- **Rules:** Specifies the default FDOT rules assigned to the structure when it is inserted into the drawing. Select an FDOT part family and click the Select All Edit icon to assign the selected style to all part sizes within that family.
- **Render Material:** Specifies the default render material assigned to the FDOT structure when it is inserted into the drawing.
- **Pay Item:** Specifies the FDOT pay item ID assigned. Select an FDOT part family, or a part size within an FDOT part family, and then click to view the already assigned pay item to all part sizes within that family, or to an individual part size within that family.

Vame	Style
🖶 📴 Index No. 425-020 (210) - Curb Inlet Type 3 (Left) with Round Bottom	
🕞 Precast Curb Inlet - Type 3 ( Left ) ( Edge ) with 42 in. Dia. Riser and 42 in. Dia	a. P FDOT Drainag
🚽 🔐 Precast Curb Inlet - Type 3 ( Left ) ( Edge ) with 42 in. Dia. Riser and 48 in. Dia	a. P FDOT Drainag
🚽 🔐 Precast Curb Inlet - Type 3 ( Left ) ( Edge ) with 48 in. Dia. Riser and 48 in. Dia	a. P FDOT Drainag
🗝 🌍 Precast Curb Inlet - Type 3 ( Left ) ( Edge ) with 42 in. Dia. Riser and 42 in. Dia	a. P FDOT Drainag
🚽 🔐 Precast Curb Inlet - Type 3 ( Left ) ( Edge ) with 42 in. Dia. Riser and 48 in. Dia	a. P FDOT Drainag
🗝 🌍 Precast Curb Inlet - Type 3 ( Left ) ( Edge ) with 48 in. Dia. Riser and 48 in. Dia	a. P FDOT Drainag
🗝 🌍 Precast Curb Inlet - Type 3 ( Left ) ( Edge ) with 42 in. Dia. Riser and 60 in. Dia	a. J FDOT Drainag
🗝 🌍 Precast Curb Inlet - Type 3 ( Left ) ( Edge ) with 48 in. Dia. Riser and 60 in. Dia	a. J FDOT Drainag
Precast Curb Inlet - Type 3 ( Left ) ( Edge ) with 42 in. Dia. Riser and 72 in. Dia	a. J FDOT Drainag
Precast Curb Inlet - Type 3 ( Left ) ( Edge ) with 48 in. Dia. Riser and 72 in. Dia	a. J FDOT Drainag
Precast Curb Inlet - Type 3 ( Left ) ( Edge ) with 42 in. Dia. Riser and 84 in. Dia	a. J FDOT Drainag
Precast Curb Inlet - Type 3 ( Left ) ( Edge ) with 48 in. Dia. Riser and 84 in. Dia	a. J FDOT Drainag
🔓 Precast Curb Inlet - Type 3 ( Left ) ( Edge ) with 42 in. Dia. Riser and 96 in. Dia	a. J FDOT Drainag
🚽 🔐 Precast Curb Inlet - Type 3 ( Left ) ( Edge ) with 48 in. Dia. Riser and 96 in. Dia	a. J FDOT Drainag
	I FROTR I

Click on the + sign to the left of FDOT Drainage style to expand the list of Structure families

Using the vertical slider button on the right side of the dialog box, scroll down to the structure family: Index No. 425-020 (210) - Curb Inlet Type 3 (left) with Round Bottom.

Click on the + sign to the left of Index No. 425-020 - Curb Inlet Type 3 (left) with Round Bottom family to expand the list and display the part sizes within the part family.

#### SUMMARY TAB:

The Summary tab is used for information and statistics related to the part list, such as number of structures or pipes used.

Property	Va	alue	
Information			 
Statistics			

#### **Exercise 5.1** Appending additional Pay Item Information to Drainage Parts

In this exercise, the designer will append additional Pay Item information contained as an Adhoc to the parts that currently do not contain the required material that needs to be quantified. The designer will use EMX and will become familiar with the drainage parts that require this extra step. For this exercise, a Proposed Drainage file has been created with a Drainage network Data referenced in.

- 1. Open the FDOT Civil 3D State Kit if not already open.
- 2. Open the *drprrd01.dwg* located in the drainage folder.
- 3. Zoom to station 707+00, you will be working with Structure S-(20) a MES.
- 4. From the FDOT Ribbon click the Entity Manager button.
- 5. In the Pay Item search box, type in **0430982125** and press enter.
- 6. Click on the Append Button located along the top of EMX and then select Structure S-(20) and press enter. Below shows a before and after.





- 7. Let's append data to two more structure, Zoom to Station 712+00 where there are two Concrete Endwalls.
- 8. In the Pay Item search box type in **0400 2 2** and press enter.
- 9. Using the Append button select the Endwalls, you can append to multiple structures at one time, then press enter to complete the command. Below shows a before and after.



- 10. Save and Close file.
- *Note* You can add additional Pay Item numbers to parts, however you can only have one compute method or formula for quantifying per part.
# **6** FDOT TAKEOFF MANAGER

## **O**BJECTIVE

The objective of this chapter is to introduce you to the functions of the FDOT Takeoff Manager (FT located on the FDOT Ribbon. The designer will become familiar with the settings and the options with the report viewer, along with the location of the formatted spreadsheets that are delivered with the State Kit.

## INTRODUCTION

The Takeoff manager is used to generate quantity reports that can then be linked to the appropriate design file using Autodesk's Data Link Manager. The designer up to this point has used all the FDOT tools available to place, draw, edit entities with Pay Items. The following is an overview of the application

## TAKEOFF MANAGER

~?	∑ Line Calc							
Takeoff	🛅 TRNS*port Sheets							
Manager	Create Table							
Quantities 👻								

Located on the FDOT Ribbon in the Quantities panel is the Takeoff Manager icon. When selected the dialog box opens. As shown below.

File Report Extents Current Drawing			~		ntity Reports			
Extents Filtering Alignment <none></none>			~		ables Qua			
Start Station: End Station:	Station: 0+00.00'							
Left Offset Distan Right Offset Distan			Γ					
Output Options Include EntityM Include Non-Al Include Drainag Include Xref Fild Output Upper O	lanage lignme ge Item es Case	r Placed Items nt Associated Items Is						
	Pa Cor	y Item Filters npute Takeoff						
	File Report Extents Current Drawing Extents Filtering Alignment €None> Start Station: End Station: Left Offset Distan Right Offset Distan Output Options ♥ Include Entity/N ♥ Include Zref Fil ♥ Output Upper O	File Report Extents Current Drawing Extents Filtering Alignment €None> Start Station: 0+00. End Station: 09+93 Left Offset Distance: Right Offset Distance: Output Options ✓ Include EntityManage ✓ Include Drainage Item ☐ Include Vrief Files ✓ Output Upper Case Pations	File Report Extents Current Drawing Extents Filtering Alignment Extents Filtering Start Station: 0+00.00' End Station: 09+99.99' Left Offset Distance: 0999' Right Offset Distance: 0999' Output Options ○ Include EntityManager Placed Items ○ Include EntityManager Placed Items ○ Include Consinger Items ○ Include Viere Files ○ Output Upper Case Pay Item Filters Compute Takeoff	File Report Extents Current Drawing ✓ Extents Filtering Alignment (None) Start Station: 0+00.00' End Station: 0+00.00' End Station: 99+99.99' Left Offset Distance: 9999' Right Offset Distance: 9999' Output Options ✓ Include EntityManager Placed Items ✓ Include EntityManager Placed Items ✓ Include EntityManager Placed Items ✓ Include Zref Files ✓ Output Upper Case Pay Item Filters Pay Item Filters	File Repot Extents Current Drawing			

## QUANTITY REPORTS TAB

When opened this is the default tab, this tab will let you run generic reports for Area, Count, Linear, & Volume. Let's look at each option available on this tab.

• **Report Extents** – This pulldown has two options available. You can use the default *Current Drawing* which will generate a report in the current drawing. The second option is *Sheet Extents* which will open the Quantities by Sheet option that is used to generate Traffic Plan quantities which is covered in a later chapter. A image of the dialog is shown below.

🔛 Quantities By Sheet	_		×
ViewFrame Groups			
- \ f === [			
Viewrianes			
Output Options			
File Output Directory:			
Open Output File			
	Calculate	Clos	se
		_	//

- Extent Filtering This section allows you to select the Alignment used for the quantity takeoff. The Alignment is used to determine the station and offset side of the entity. You can either select from the pulldown or use the selection button to pick the alignment. The default is the total length of the alignment, but you can either type in a station range manually or use the pick button to select a starting point or ending point along the alignment. The offset distance options allow you to choose how far the search distance is that the application uses to find entities with pay item information. The default is 10,000' Left and Right.
- **Output Options** This section allows the designer to choose the options used to determine what is reported. By default, the *Include Entity Manager Placed Items & Include Non-Alignment Associated Items* are turned on. This will assure that any items placed by EMX and items that are not associated to an alignment will show in the report. You have an option to report Drainage Networks independently if desired or included in your report (as of this writing a Summary of Drainage Structures report process is being developed). You can also toggle on the *Include Xref Files* if you want to include the quantities that are on an xref file in the background of your source design file. The *Output Upper Case* is set by default since it is a FDOT Standard that the report text be in Upper Case.

# PAY ITEM FILTERS

Pay Item Id	Description	Unit Type	Compute Method
🕂 🗌 😽 101	Mobilization		
🕂 🔲 😽 102	Maintenance of Traffic		
🕂 🗔 😽 104	Erosion Control		
🕂 🗔 😽 110	Clearing and Grubbing		
0-120-175	Excavation, Embankment, and other Earthwork		
🕂 🗌 😽 200-299	Base Courses		
🕂 🗌 😽 300-341	Bituminous Mixtures, Milling, Superpave, Friction Course		
🕂 🔲 😽 346-347	Portland Cement Concrete		
🕂 🔲 😽 350-353	Concrete Pavement		
9 🖸 😽 370-370	Bridge Expansion Joints for Concrete		
🕂 🗔 😽 400	Concrete Structures		
🕂 🛄 😽 415	Reinforcing Steel		
425-439	Drainage: Inlets, Manholes, Junction Boxes, Trench Drain		
440-449	Drainage: Pipes, Underdrain, French Drain, Edgedrain		
450-453	Precast, Prestressed Concrete		
455	Structures Foundations: Piling, Drilled Shafts		
457	Integral Pile Jacket		
465	Movable Bridge		
470	Timber Structures		
08-510	Movable Bridges: Navigation Lights, Machinery		
520-522	Concrete Gutter, Curb, Barriers, Traffic Separator, Sidewalk		
523	Patterned/Textured Pavement		
- 🛛 😽 524-529	Concrete Gutter, Curb, Barriers, Traffic Separator, Sidewalk		
🕂 🔲 🐺 530	Riprap		
🕂 🗔 😽 534	Sound Barriers		
9 536-545	Guardrail, Attenuators, Visual Barriers		
- 🛛 🐺 546	Rumble Strips		
- 🛛 😽 548	Retaining Walls		
🕂 🔲 🐺 550	Fencing		
0 🕞 😽 555-557	Directional Bore, Vibratory Plowing, Jack and Bore		
570-580	Grassing, Seeding, Sodding, Landscaping, Trees, Plants		
600-699	Signalization: Conduit, Mast Arms, Detectors, Cabinets		
00-706	Signing, Delineators, RPM		
09-714	Pavement Markings: Paint, Thermo		
🕂 🗌 🧱 715	Lighting: Poles, Conduit		
750-751	Architectural Buildings		
- 🛛 😽 780-789	Intelligent Traffic Systems (ITS)		
800-899	Mass Transit		
🕂 🗔 😽 900-999	Special, Developmental, Trial Items		

Pay Item Filters are used to select a specific category that you want to run a report against. The dialog box is set up in tree mode that you can either select a whole category number or expand and select individual items, when complete with the report open the Filter dialog box and select **Clear Selection.** 

## COMPUTE TAKEOFF

Clicking this will execute the report generation process which looks like image below.

			л <del>т</del>		(C D )				
		1	Area la	ake	eoff Report				
y Item	Description	Object Name	Quantity	Unit	Baseline Alignment	Start Station	End Station	Min Offset	Max Offset
5706	OPTIONAL BASE, BASE GROUP 06	HATCH	12644.84	SY	CLSR7	526+91.24	551+99.85	6.70 RT	98.75 RT
		Quantity Total:	12644.84						
012	PERFORMANCE TURF, SOD	HATCH	39.64	SY	CLSR7	534+18.31	534+60.68	63.81 RT	73.02 RT
	PERFORMANCE TURF, SOD	HATCH	273.72	SY	CLSR7	534+22.13	535+97.31	2.32 RT	19.54 RT
	PERFORMANCE TURF, SOD	HATCH	61.74	SY	CLSR7	534+68.94	535+09.80	61.10 RT	75.51 RT
	PERFORMANCE TURF, SOD	HATCH	76.05	SY	CLSR7	535+29.12	535+65.65	65.01 RT	84.56 RT
	PERFORMANCE TURF, SOD	HATCH	57.08	SY	CLSR7	535+37.89	535+89.14	66.70 LT	77.68 LT
	PERFORMANCE TURF, SOD	HATCH	106.36	SY	CLSR7	536+14.82	536+97.07	4.18 RT	17.33 RT
		Quantity Total:	614.59						
									Page # 1
lect Report	t Type: Area Takeoff Report	R		Create	TRNS*PORT File				

## SUMMARY TABLES TAB

_			_
×	File	^	4
22	Alignment Options		epor
	Report station and offset relative to:		ity R
	<none> V</none>		Quant
	Summary Table Options		_
	Summary of Barrier Walls Summary of Curb and Traffic Separators Summary of Dirkh Pavement Summary of Dirkh Pavement Summary of Erosion Control Summary of French Drain Summary of French Drain Summary of Mailboxes Summary of Mailboxes Summary of Mailboxes Summary of Pavement Summary of Performance Turf Summary of Performance Turf		Summary Tables
	Summary of Railing Summary of Sidewalk		
GER	Output Options		
ANA	File Output Directory:		
PFF N			
AKEC	Include EntityManager Placed Items		
1 LO	Include Non-Alignment Associated Items		
E A	Include Drainage Items	¥	
_			

- Alignment Options The *Report station and offset relative to:* section allows you to select the Alignment used for the quantity takeoff. The Alignment is used to determine the station and offset side of the entity. You can either select from the pulldown or use the selection button to pick the alignment. The default is the total length of the alignment, but you can either type in a station range manually or use the pick button to select a starting point or ending point along the alignment.
- Summary Table Options This section contains the automated reports, meaning that when the report is run the data is automatically transferred to the spreadsheet and opened in excel for viewing and is ready to be linked to the drawing file. You can run multiple reports at one time or run them one at a time.
- **Output Options** This is where you can control where the reports are saved, typically they are located in the Calculations folder within your project. The other options here are like the output options on the *Quantity Reports* tab with the exceptions of *Create Corresponding CSV File(s)* which will create a separate CSV (Comma, Separated, Value file) along with the formatted spreadsheet report and the *Open Output File(s)* which will launch Excel and open the Automated report(s) when complete.
- Create Summary Tables Executes the command to generate the reports that were selected to run, when complete Excel will open and if you run multiple reports at once a separate session of excel will open for each report.

### **REPORT VIEWER**

When a report is run from the Quantity Reports tab a generic report viewer opens with the following options, see image below for details.



# **7** QUANTITIES BY SHEET

## **O**BJECTIVE

The Objective of this chapter is to provide the designer an over view of the workflow to generate reports of Traffic Plan quantities, which are reported per sheet and automatically transferred to a formatted spreadsheet which is ready to be linked to the appropriate design file.

## INTRODUCTION

A new function that has been added to Takeoff manager is called Quantities by Sheet, which works when you have View Frame Groups in a design file. You can be in Model space and run the application on an unlimited number of view frame groups and frames at once, unlike before where you had to be in an individual sheet and run a per sheet report that produced an unformatted report for each sheet layout that the drawing contained. It is important to note that the sheets (view frames) should be numbered as they would be in the plans (S-1,S-2,etc), since you could have duplicate view frame numbers on multiple alignments, which will create an error. Below is an overview of the options available.

🛃 Quantities By Sheet	-		×
ViewFrame Groups			
Signing & Pavement Marking BL98 Signing & Pavement Marking SR61			
- ViewFrames			
Output Options			
File Output Directory:			
Open Output File			
(	Calculate	Clos	se

• View Frame Groups – This will display the available view frame groups in the drawing file. They can either be in the source file itself, or Data referenced in. You can select and run all View Frame Groups at once. The application will not function without a View Frame Group present.

- **Viewframes** This list contains the individual View Frames that are in the View Frame Group. You can select the entire list by dragging the mouse over the left side of the list or by holding the 'Ctrl' key and left clicking your mouse.
- **Output Options** This is where you tell the application to save your report, you should save it in your calculations folder in your project.
- **Calculate** This executes the report generation. Upon completion, a message box opens informing you that the report was created successfully and without errors, after clicking OK Microsoft Excel will launch and open the report.
- **Close** This button closes the Quantities by Sheet application, it is recommended that you also close Takeoff Manager after use. If FDOT applications are left open and the designer opens another drawing file you run the risk of crashing Civil 3d.

### **Exercise 7.1** Running a Report using Quantities by Sheet and Linking to file

In this exercise, the designer will use an already set up file that contains View Frames, Alignments, and Signing & Pavement Marking information and run a report of Traffic Plan Tabulation of Quantities report. The designer will then use Data Link Manager to link the report to the appropriate design file.

#### Running a Report (Part 1)

- 1. Open the FDOT Civil 3D State Kit if not already open.
- 2. Open the *dsgnsp01.dwg* located in the Signing folder within your project.



- 3. On the FDOT Ribbon, click on the Takeoff Manager icon located on the Quantities panel.
- 4. Under the Report Extents pulldown select Sheet Extents



- 5. The Quantities by Sheet dialog box opens, select the **Signing & Pavement Marking SR61** View Frame Group.
- 6. Left Click your mouse and drag inside the left column from top to bottom selecting all View Frames.



- 7. Click on the Ellipse button on *File Output Directory* and browse to your **Calculations** folder as the save location.
- 8. Leave *Open Output File* toggled on and click on **Calculate**.

At this point on your screen you see the application highlight individual view frames as it processes.

9. The report information box opens, Click OK.



10. The Report opens in Excel as shown below.

	-	_		_									-	
PAY						5	SHEET NU	MBERS				TOT. TH	AL IS	GRAND
ITEM	DESCRIPTION	UNIT	1		2	3	4	5		6		SHE	ET	TOTAL
			PLAN	FINAL	PLANEINAL	PLANEIN	AL PLANEI	NAL PLANET	NAL PL		PLANEINA	PLAN	FINAL	PLANEIN
0700 111	Single Post Sign, F&I Ground Mount, Up To 12 SF	AS	13		4	6	7	8		1		39		39
0700 112	Single Post Sign, F&I Ground Mount, 12-20 SF	AS	1		1		1	1				4		4
0700 113	Single Post Sign, F&I Ground Mount, 21-30 SF	AS			1	1					1	1		1
0700 2 18	Multi- Post Sign F&I Ground Mount 301-400 SF	AS			1	1					1	1		1
0706 3	Retro-Reflective Pavement Markers	EA	121	•••••	23	33	8					185		185
0710 11101	Painted Pavement Markings, Standard, White, Solid, 6"	GM	.573		253	312	.248	.186		126		1.698		1.698
0710 11102	Painted Pavement Markings, Standard, White, Solid For Interchange And Urban Island, 8"	GM	.027								1	.027		.027
0710 11123	Painted Pavement Markings, Standard, White, Solid For Crossy alk And Boundabout, 12	LF	340								1	340		340
0710 11124	Painted Pavement Markings, Standard, White, Solid For Diagonal Or Chevron, 18*	LF	233									233		233
0710 11125	Painted Pavement Markings, Standard, White, Solid For Ston Line Or Crosswalk, 24"	I.F.	158		48		50					256		256
0710 11131	Painted Pavement Markings, Standard, White, Skip, 10-30 Dr 3-9 Skip, 6" Wide	GM	105		268	275	.054					702		702
0710 11141	Painted Pavement Markings, Standard, White, 2-4 Dotted Guideline/ 5-10 Dotted Extension, 5"	GM	032		042	015					*	089		089
0710 11160	Painted Pavement Markings Standard White Message Dr Sumbol	FA	3		3							6		6
0710 11170	Painted Pavement Markings Standard White Arrows	FA	13		1	3	2					19		19
0710 11201	Painted Pavement Markings, Standard Yellow, Solid 6"	GM	248		186	187	070				+	692		692
0711 11123	Thermoplastic. Standard, White, Solid. 12" For Crosswalk And Boundabout	LF	340								1	340		340
0711 11125	Thermonlastic Standard White Solid 24" For Ston Line And Crosswalk	IF	158		48		50					256		256
0711 11160	Thermonlastic Standard White Message Or Sumbol	FA			2							2		2
0711 11170	Thermonlastic Standard White Arrow	FA	6								+	6		6
0711 14125	Thermonlastic Preformed White Solid 24" For Crosswalk	1 F	296			1					+	296		296
0711 14160	Thermonlastic Preformed White Messane	FA	4		2	2	1					9		9
0711 14170	Thermonlastic Preformed White Arrow	FA	4		2	5	3					14		14
0711 15101	Thermoplastic. Standard-Open Graded Asphalt Surfaces White. Solid. 6"	GM	.526		.253	.312	.248	. 186		126				1.652
0711 15131	Thermonlastic Standard-Open Staded Asphalt Surfaces White Skin 6" 10-30 Skin 0t 3-3 Lane Dron	GM	105		268	275	054				1	·····		702
0711 15201	Thermoplastic. Standard-Open Graded Asphalt Surfaces. Yellov. Solid. 6"	GM	.248	•••••	.186	.187	.070							.692
												1		
						1					1			
						1						1		
												1		
												1		
						1				î	1	1		
						·····					1	1		
1						1					1			
											1	1		
						1					1	1		
											1			
											1	1		
						1					1	1		
						1					1	1		
			-								1			
1											1	1		
1			1			1					1	1		
1		1									1	1		
		1	1			1					1	1		
1			1								1	1		
1											1	1		
1			1								1	1		

Notice the Sheet numbers in the report. Depending on how many view frames you have the report could have many sheets, each report sheet contains up to 7 plan sheets, which means if you have 21 View Frames you will have 3 report sheets listing 7 pages each. The quantities are added together from each sheet and will give you a Grand Total of the entire project.

11. Save and Close the Excel File.

#### Linking Report (Part 2)

In this part of the exercise, the designer will create a new file that will contain the Linked spreadsheet file that was created in the previous steps.

- 1. Continuing with the *dsgnsp01.dwg* open, switch to the FDOT Ribbon and select Create File.
- 2. Fill in the following as shown below, you will be creating a *tabqsp01.dwg*

Create File (v	2018.0.3.9)	×						
Project:	C:\e\projects\FDOT C3D Quantities\FDOT C3D Quantities Cr $\vee$	Select Project						
Discipline:	ROADWAY							
File Group:	Signing and Pavement Marking Design Files $\sim$							
File Type:								
Guide Sign Work Sheet and Details Key Sheet Layout as a Typical Design or Passing Zone Maat Am Detail for Signing Motif File for Profile Sheets Plan Sheet Proposed Design Roddray: Solat Special Details - Miscellameous Special Details of Overhead Summary of Pay Item Sheets Text Labels and Miscellameous Descriptions Text Labels and Miscellameous Descriptions Text Labels and Miscellameous Descriptions								
Output File:	TABQSP01.dwg							
Output Folde	r: signing\	Browse						
Template:	fdotmaster.dwt	Browse						
Template Pa	th: data/templates/							
Coordinate S	system: FL North ~							
Cre	ate/Open File	Browse Browse						

- 3. Click on Create/Open File.
- 4. After file is opened, click on **Close** to exit dialog.
- 5. Close the *dsgnsp01.dwg* if still open.
- 6. Make **Tables\_dp** the current layer.
- 7. Select the Model Layout Tab.
- 8. On the FDOT Ribbon click on the Create Table icon, located on the Quantities Panel.
- 9. Click on the From a data link.

€ From a data link	
No data links found 🗸 🖽	1
Creates a table from data in an external spreadsheet.	

- 10. Step 1 as shown in the diagram below, click the Link button to open the Select a Data Link dialog.
- 11. Step 2, click on the Create a new Excel Data Link.
- 12. Step 3, For name type in Tab of Qty and select OK.

Insert options O Start from empty table From a data link No data links found From object data in the drawing (Data Extr	Select a Data Link  Links:  Create a new Excel Data Link  Enter Data	ta Link Name
Preview  Thie  Header Header	Name:	Tab of Qty OK Cancel
Date	Details No details available.	~
Data Data Data Data Data Data	Preview No preview available. OK Cancel	Help

- 13. Click the Ellipse button and browse to the Calculations folder and select the **Tabulation of Quantities** report. Each report will have a time stamp on it to prevent you from over writing a report by mistake.
- 14. Select **Open** to start the loading process.
- 15. Press **OK** on all open dialog boxes one at a time to close them all.
- 16. On the command line the word **Table** is visible, this is the indication that it is working, be patient it may take a minute. If you don't see the word Table then a step above has been missed.



- 17. After a Minute or so a report is attached to your cursor, left click anywhere in the screen, since you are in Model Space.
- 18. AutoCAD has a bug when linking a report and this is the fix for it, notice in the image below the row *Sheet Numbers* is collapsed.

		1	ABULA	TION	OF Q	UANT I T	IES		CUEET 1					
PAY ITEM	DESCRIPTION	UNIT		1		UNIT 1		2	Ę	3	2	10MBERS 1	-	5
NO.			PLAN	FINAL	PLAN	FINAL	PLAN	FINAL	PLAN	FINAL	PLAN	FINA		
0700 1 11	Single Post Sign, F&I Ground Mount, Up To 12 SF	AS	13		4		6		7		8			
0700 1 12	Single Post Sign F&I Ground Mount 12-20 SF	AC	,		,				,		,			

19. Left click in the Pay Item No. cell and click on the top blue grip of the cell and with osnaps turned off, drag it slightly above its current selection and left click.



20. The result is it un collapses the Row as shown below.

		1	FABULA	TION	OF Q	UANT I T	IES			
									SHEET I	NUMBERS
PAY										
ITEM	DESCRIPT ION	UNIT		1	· ·	2	-	3		4
NO.										
			PLAN	FINAL	PLAN	FINAL	PLAN	FINAL	PLAN	FINAL
0700 1 11	Single Post Sign, F&I Ground Mount, Up To 12 SF	AS	13		4		6		7	
0700 1 12	Sinale Post Sian. F&I Ground Mount. 12-20 SF	AS	1		1				1	

- 21. Click the blue lock to un lock it, double click inside the view port to make it active.
- 22. Zoom Extents to fill the View port Border with the report.
- 23. Click on the Lock again to lock the viewport.

From here you could Right click on the layout and rename it to the proper name and add the sheet to the project sheet set, which will fill in information on the Sheet Border. See the Traffic Plans Manual for additional steps and details to accomplish that task if needed.

Your drawing should look like below.

24. Save and Close your file.



# **8** QUANTITY REPORTS

## **OBJECTIVES**

The objective of this chapter is to teach the designer how to use the FDOT Takeoff Manager (FTM) to run the various reports that are required to meet the departments established workflows.

## INTRODUCTION

This chapter covers the detailed functionality of using the FDOT Takeoff manager to generate the reports based off the pay item entities that were added in earlier chapters, for a detailed description of options on FTM refer to Chapter 6. The location of the formatted spreadsheets that are in the State Kit is also covered.

#### **Exercise 8.1** Run a Linear Report

#### > Running a Linear Report on the Quantity Reports tab (Part 1)

In this exercise, the designer will run a series of Linear reports with FTM, utilizing the *Quantity Reports and Summary Tables* tab.

- 1. Launch the FDOT Civil 3D State Kit if not already open.
- 2. Open the *dsgnrd01.dwg* located in the Roadway folder of your project.
- 3. On the FDOT Ribbon click on the Takeoff Manager icon.
- *Note* You can close Toolspace and dock the FTM dialog in its place to gain screen real estate.
- 4. Use the pull down to select the alignment **SR61** and match the image below.

FDOT TAKEOFF M	ANAGER	
File		8
Report Extents		eport
Current Drawing	~ 🗈	tity R
Extents Filtering		Quan
SR61	~	bles
Start Station:	698+53.79 <sup>,</sup>	many Ta
End Station:	726+41.49'	Sum
Left Offset Distan	ce: 9999'	
Right Offset Distan	ce: 9999'	
Output Options		
Include EntityN	lanager Placed Items	
Include Non-Al	ignment Associated Items	
Include Drainag	je Items	
Include Xref File	25	
Output Upper 0	lase	

- 5. Select **Compute Takeoff.** The drawing will be read for all objects that contain Xdata. A report viewer will open when complete.
- 6. The *Area Takeoff Report* is displayed by default. which is blank, since no areas exist in this file.
- 7. Change the report type to the *Linear Takeoff Report*. Let's look at the report viewer and what is being reported.

### **REPORT VIEWER**

- Pay Item This column displays the Pay Item number associated with the objects.
- **Description** The description matches what is in the EMX database and BOE.
- Object Name The object type displays what each object type it is, Line, Polyline, Arc, Featureline, etc.
- **Quantity** This column displays the total length of each segment the application found.
- Unit This column displays how the Item is quantified, LF, EA, SY, etc.
- Baseline Alignment This column displays what alignment the objects are associated with.
- Start/End Station These columns display the start and/or the end station of the object along the associated alignment.
- Min/Max Offset These columns display the offset and side of the object along the selected alignment.

The report shows individual objects of the same Pay Item number, but provides a Quantity total for each number.

4 1	of 2 🕨 🎽   🖷 🛞 🕲   🏭 🗐 💷 🔍 -	100% •	Fin	nd   N	ext				
		L	inear T	Tak	eoff Report				
ay Item	Description	Object Name	Quantity	Unit	Baseline Alignment	Start Station	End Station	Min Offset	Max Offset
017	CONCRETE CURB & GUTTER, TYPE E	POLYLINE	21	LF	SR61	698+81.00	698+94.63	40.92 RT	53.89 RT
	CONCRETE CURB & GUTTER, TYPE E	ARC	21	LF	SR61	698+81.00	698+94.63	40.92 RT	53.89 RT
	CONCRETE CURB & GUTTER, TYPE E	POLYLINE	7	LF	SR61	698+94.63	699+01.25	40.92 RT	40.99 RT
	CONCRETE CURB & GUTTER, TYPE E	POLYLINE	90	LF	SR61	699+01.25	699+66.22	40.99 RT	95.05 RT
	CONCRETE CURB & GUTTER, TYPE E	POLYLINE	6	LF	SR61	699+65.94	699+66.33	95.05 RT	101.04 RT
	CONCRETE CURB & GUTTER, TYPE E	ARC	170	LF	SR61	700+25.53	701+34.03	41.10 LT	149.60 LT
	CONCRETE CURB & GUTTER, TYPE E	POLYLINE	164	LF	SR61	700+25.70	701+34.03	41.10 LT	143.63 LT
	CONCRETE CURB & GUTTER, TYPE E	POLYLINE	6	LF	SR61	700+41.74	700+42.15	94.32 RT	100.40 RT
	CONCRETE CURB & GUTTER, TYPE E	POLYLINE	86	LF	SR61	700+41.85	701+00.03	41.90 RT	94.32 RT
	CONCRETE CURB & GUTTER, TYPE E	POLYLINE	1286	LF	SR61	701+00.03	714+21.65	41.49 RT	41.90 RT
	CONCRETE CURB & GUTTER, TYPE E	POLYLINE	1325	LF	SR61	701+34.03	714+24.04	41.10 LT	41.51 LT
	CONCRETE CURB & GUTTER, TYPE E	POLYLINE	712	LF	SR61	703+71.03	710+89.08	9.67 RT	9.90 RT
	CONCRETE CURB & GUTTER, TYPE E	POLYLINE	52	LF	SR61	703+71.03	704+21.25	5.97 RT	9.10 LT
	CONCRETE CURB & GUTTER, TYPE E	POLYLINE	723	LF	SR61	704+21.25	711+38.69	9.10 LT	9.36 LT
	CONCRETE CURB & GUTTER, TYPE E	POLYLINE	52	LF	SR61	710+89.08	711+38.69	.10 RT	9.67 RT
	CONCRETE CURB & GUTTER, TYPE E	POLYLINE	77	LF	SR61	714+21.65	714+70.14	41.49 RT	91.27 RT
	CONCRETE CURB & GUTTER, TYPE E	POLYLINE	75	LF	SR61	714+24.04	714+72.53	41.51 LT	89.12 LT
	CONCRETE CURB & GUTTER, TYPE E	POLYLINE	75	LF	SR61	714+97.21	715+45.70	41.49 RT	88.71 RT
	CONCRETE CURB & GUTTER, TYPE E	POLYLINE	77	LF	SR61	714+99.57	715+48.06	41.51 LT	90.90 LT
	CONCRETE CURB & GUTTER, TYPE E	POLYLINE	28	LF	SR61	715+45.70	715+73.93	41.49 RT	41.49 RT
	CONCRETE CURB & GUTTER, TYPE E	POLYLINE	20	LF	SR61	715+48.06	715+67.93	41.51 LT	41.51 LT
	CONCRETE CURB & GUTTER, TYPE E	POLYLINE	6	LF	SR61	715+67.93	715+73.93	41.51 LT	42.43 LT
		Quantity Total:	5079						
20 5 11	TRAFFIC SEPARATOR, CONCRETE, TYPE I, 4' WIDE	POLYLINE	303	LF	SR61	700+69.04	703+71.03	5.90 RT	9.90 RT
	TRAFFIC SEPARATOR, CONCRETE, TYPE I, 4' WIDE	POLYLINE	150	LF	SR61	711+38.69	714+36.38	9.36 LT	9.51 LT
	TRAFFIC SEPARATOR, CONCRETE, TYPE I, 4' WIDE	POLYLINE	149	LF	SR61	711+38.69	714+36.38	5.36 LT	5.51 LT
	TRAFFIC SEPARATOR, CONCRETE, TYPE I, 4' WIDE	ARC	3	LF	SR61	714+36.38	714+38.37	5.51 LT	9.51 LT
		Quantity Total:	605						
86 1 0	GUARDRAIL -ROADWAY, GENERAL/LOW SPEED TL-2	FEATURELINE	125	LF	SR61	700+30.25	700+34.84	148.31 LT	273.66 LT
	GUARDRAIL -ROADWAY, GENERAL/LOW	POLYLINE	83	LF	SR61	700+33.47	700+67.25	74.47 LT	148.31 LT

- 8. Close the report by clicking on the X in the upper right corner.
- 9. Save the drawing before continuing.

#### **Exercise 8.2** Running a Formatted Linear Report

#### > Running a Linear Report on the Summary Tables tab (Part 2

In this portion of the exercise, the designer will run a Linear Curb & Gutter report on the summary tables tab which will launch Microsoft excel and open the excel spreadsheet filled in with the data.

- 1. Continuing in the *dsgnrd01.dwg* file
- 2. With FTM still open switch to the Summary Tables tab.
- 3. Select the **SR61** alignment and make the following selections on the dialog, browse to the calculations folder in your project for the report location.

Cha	ntor	R
Ulla	plei	0

File	2
Alignment Options	
Report station and offset relative to:	4
SR61 ~	and the
Summary Table Options	
Summary of Barrier Walls	~ 8
Summary of Curb and Traffic Separators	4
Summary of Ditch Pavement	1 2
Summary of Driveways	8
Summary of Edgedrain	
Summary of Engling	ľ
Summary of French Drain	
Summary of Guardrail	
Summary of Mailboxes	
Summary of Misc. Asphalt	
Summary of Pavement	1
Summary of Performance Lurf	
Summary of Permanent Crash Cushions	
Summary of Sidewalk	-
Output Options	_
File Output Directory:	
C:\e\projects\FDOT C3D Quantities\FDOT (	
Include EntityManager Placed Items	
Include Non-Alignment Associated Items	
Include Drainage Items	
Include Xref Files	
🗹 Output Upper Case	
Create Corresponding CSV File(s)	

- 4. Select Create Summary Tables to execute the report.
- 5. Microsoft Excel launches and opens the report. An information dialog box opens and notifies you the report has successfully been created.

		SUMMARY	OF CI	JRB & C	GUTTER	AND/OR	TRAFF	IC SEPA	RATORS					
PAY ITEM		LOCATION		AREA	UNIT		QUANT ITY				т	TAL	DESIGN	CONSTRUCT I ON
NO.	PAT TIEM DESCRIPTION	574 70 574	SIDE	ID	UNIT	GROSS	DEDU	CTIONS	NET L	ENGTH	7		NOTES	REMARKS
		5/4. 10 5/4.				LENGTH	TYPE	LENGTH	Р	F	P F			
0520 1 7	CONCRETE CURB & GUTTER, TYPE E	698+81.00 to 698+94.63	RT	20423BD	LF				20.8		508			
		698+81.00 to 698+94.63	RT	20423B1					20.8					
		698+94.63 to 699+01.25	RT	20423B8					6.6					
		699+01.25 to 699+66.22	RT	20423B9					89.6					
		699+65.94 to 699+66.33	RT	20423D2					6.0					
		700+25.53 to 701+34.03	LT	204231C					170.4		T			
		700+25.70 to 701+34.03	LT	2042364					164.5		1			
		700+41.74 to 700+42.15	RT	2042369					6.1					
		700+41.85 to 701+00.03	RT	204236D					85.8					
[		701+00.03 to 714+21.65	RT	2042385					1285.9		1			
[		701+34.03 to 714+24.04	LT	2042380					1325.3		1			
		703+71.03 to 710+89.08	RT	2042331		1			712.3		1			
		703+71.03 to 704+21.25	LT/RT	204232B					52.4		1			
		704+21.25 to 711+38.69	LT	2042395					723.4		1			
		710+89.08 to 711+38.69	LT/RT	20423DF					51.8		1			
		714+21.65 to 714+70.14	RT	204235F		1			77.5	·····	1			
		714+24.04 to 714+72.53	LT	2042361		1			75.3		1			
[		714+97.21 to 715+45.70	RT	2042360					74.9		1			
[		714+99.57 to 715+48.06	LT	2042362					77.1		1			
		715+45.70 to 715+73.93	RT	2042386		1			28.2		1	1		
		715+48.06 to 715+67.93	LT	2042381		1			19.9		1	······		
		715+67.93 to 715+73.93	LT	2042389					6.1					
0520 5 11	TRAFFIC SEPARATOR, CONCRETE, TYPE 1, 4' WIDE	700+69.04 to 703+71.03	RT	20426A3	LF				303.1		60			
		711+38.69 to 714+36.38	LT	204232D					149.8		1			
		711+38.69 to 714+36.38	LT	204232F		1			149.4		1	1		
t		714+36.38 to 714+38.37	LT	2042391					3.1		†		1	
l			·····	1							t			
l		+	ŀ	1	+	+				<u> </u>	+	÷	1	

SUMMARY OF CURR & GUTTER AND/OR TRAFFIC SEPARATORS

6. The report which shows Curb and Gutter & Traffic Separator lengths is displayed below.

The report which reports the same information as seen in the previous exercise is now formatted in the appropriate spreadsheet and is ready to link to the design file.

- 7. Save and Close the Excel file, you will link this report later.
- 8. Save and Close the drawing file.

.

1

### Exercise 8.3 Running a Guardrail Report

In this exercise, the designer will run a *Summary of Guardrail* report from the Summary Tables tab and save the file to the calculations folder in the project.

- 1. Continuing in the *dsgnrd01.dwg* file.
- 2. Using the steps from the previous exercise create and save a summary of guardrail report.



				SUMMARY C	F GU	ARDRAIL	
LOC	CAT I	ON	SIDE	GUARDRAI (W-BEAM, LOW SPEED, T	L 'L-2)	DESIGN NOTES	CONSTRUCT I ON REMARK S
STA.	то	STA.		0536 1 LF P	0 F		
700+30.25	to	700+34.84	LT	125.4			
700+33.47	to	700+67.25	LT	83.5			
700+77.74	to	701+35.50	LT	61.4			
701+01.06	to	703+00.04	RT	199.0			
701+35.50	to	703+00.04	LT	164.5			
703+00.04	to	711+38.64	LT	849.6			
705+70.42	to	713+25.27	RT	712.7			

3. Save your drawing before continuing

#### Exercise 8.4 Running a Linear report with Modified Station Values and Offsets

In this exercise, the designer will run a Linear report along a station range with the offset or swath search distance shortened on one side.

- 1. On FTM switch back to the *Quantity Reports* tab.
- 2. Select the SR61 alignment.
- 3. For *Start Station* type in **700+50**.
- 4. For *End Station* type in **704+00.**
- 5. For Right Offset Distance type in 20, leave Left Offset Distance at its default value.
- 6. Select **Compute Takeoff** to execute the report.

7. Change the Report type to *Linear Takeoff Report*.

FDOT Takeoff M	anager - Report Viewer								- 🗆
≪ 1	of 1 🕨 🗏   🗧 🛞 🚱   🔂 🗐 💷 尾 -	100% -	Fir	nd   N	ext				
		L	inear T	Гak	eoff Report				
Pay Item	Description	Object Name	Quantity	Unit	Baseline Alignment	Start Station	End Station	Min Offset	Max Offset
0520 5 11	TRAFFIC SEPARATOR, CONCRETE, TYPE I, 4' WIDE	POLYLINE	303	LF	SR61	700+69.04	703+71.03	5.90 RT	9.90 RT
		Quantity Total:	303						
0536 1 0	GUARDRAIL -ROADWAY, GENERAL/LOW SPEED TL-2	POLYLINE	61	LF	SR61	700+77.74	701+35.50	48.11 LT	66.18 LT
	GUARDRAIL -ROADWAY, GENERAL/LOW SPEED TL-2	FEATURELINE	165	LF	SR61	701+35.50	703+00.04	48.11 LT	48.24 LT
		Quantity Total:	226						
									Page # 1

Since the Right-side offset was set to 20' the guardrail was not picked up in the report. Keep in mind that when working with shapes, unless the entire shape is within the search parameters it will not show up in the report.

- 8. Click on the X in the upper right corner to close the report.
- 9. Save and Close the *dsgnrd01.dwg* drawing file.

#### **Exercise 8.5** Running Shape Reports

In this exercise, the designer will open the shape drawing file that was created earlier and run and save the appropriate reports that will be linked to the design files.

- 1. Launch the FDOT Civil 3D State Kit if not already open.
- 2. Open the qtdsrd01.dwg located in the roadway folder of your project.
- 3. Switch to the Model tab, since we are running the reports its ok for all the shapes to be merged together. You can switch to the individual shapes along the bottom if you need to examine a specific shape.
- 4. On the FDOT Ribbon, select the Takeoff Manager.
- 5. Since we want the formatted reports, select the Summary Tables tab.
- 6. Select the Summary of Pavement report with the following options.



- 7. Select **Create Summary Tables** to execute the report.
- 8. The report and an information box will open upon completion.
- 9. Save the drawing file before continuing.

			SUMMARY	OF PA	VEMENT								
PAY ITEM	DAY ITEN DESCRIPTION	LOCATION		ELDE	AREA	GTH	лн	UNIT	QUAN	πιτγ	то	TAL	DE
NO.	PAT TIER DESCRIPTION	STA. TO STA.	DESCRIPTION	5100	ID	ΥEΝ	MIL	UNTI	Р	F	P	F	NC
0285706	OPTIONAL BASE, BASE GROUP 06	699+65.03 to 715+47.97		LT/RT	4049928			SY	14227.06		14227.1		
0334 1 52	SUPERPAVE ASPHALTIC CONCRETE, TRAFFIC B, PG 76-22	699+65.03 to 715+47.97		LT/RT	4049984			τN	1168.27	ç	1168.3		
0337 7 25	ASPHALT CONCRETE FRICTION COURSE, INC BIT, FC-5, PG 76-22	699+65.03 to 715+47.97		LT/RT	4049900			TN	566.43		566.4		

*Hint* Did you know that the report would look the same if you initiated it from one of the Shape sheet layouts instead of the model tab? This is because the shapes still reside in the file, they are just visually turned off in the layout.

#### Exercise 8.6 Running Multiple Reports at Once

In this exercise, the designer will run the Performance Turf and Sidewalk report simultaneously and save the reports to the calculations folder within the project.

- 1. Continue working in the *qtdsrd01.dwg*.
- 2. On FTM Left click on Summary of Performance Turf.
- 3. Hold the CTRL button and left click on Summary of Sidewalk, make other selections as shown below.
- 4. Make sure you save the reports in the calculations folder.



5. Select Create Summary Tables to execute the reports.

6. Microsoft Excel launches and opens a separate session for each report run. There is no limit to the number of reports you can run at a time.

	-	-		~		×	
		SUMMAR	Y OF S	IDEWAL	K & DETECTABLE	WARNINGS	
LOCATION	6105	AREA	sтн	тн	CONC SIDEWALK	DESIGN	CONST RUCT I ON
STA. TO STA.	SIDE	ID	ГEN	MIL	SY SY	NOTES	REMARKS
700+16.98 to 711+38.66	LT	4049AD1			P F 591.4		
700+42.11 to 711+38.73	RT	4049AD9			621.9		
		_	SUM	MARY OF	PERFORMANCE T	URF	
LOCATION			H	н	PERFORMANCE TURF	DESIGN	CONSTRUCTION
	SIDE	AREA ID	LSN 2	TDT	0570 1 1	NOTES	REMARKS
STA. TO STA.			17	*	SY		
701+00.03 to 714+21.65	RT	404BFC3		-	1135.02		
701+34.03 to 714+24.04	LT	404B292			1186.06		
703+71.03 to 711+38.69	LT/RT	404A61F			1408.49		

- 7. Save and Close both Excel files.
- 8. Save your drawing file before continuing.

#### **Exercise 8.7** Running reports using the Pay Item Filters

In this exercise, the designer will run a quick report on just the friction course pavement using the pay item filters, which will exclude all other visible objects.

- 1. Continue working in the *qtdsrd01.dwg* file.
- 2. Switch to the model tab.
- 3. On FTM switch to the Quantity Reports tab.
- 4. Click on the **Pay Item Filters** located on the bottom of FTM.
- 5. Since the Pay Item number, you want to find is 0337 7 25, expand the 300-341 category.

] 🐺 200-299	Base Courses
300-341	Bituminous Mixtures, Milling, Superpave, Friction Course
-0315 1 2	Stress Absorbing Membrane, Project Number 436543-1-52-01
-0315 1 3	Stress Absorbing Membrane, Project Number 436164-1-52-01
-0315 1 4	Stress Absorbing Membrane, Project Number 437617-1-52-01
-0327 70 1	Milling Exist Asph Pavt, 1 Avg Depth
- 0327 70 2	Milling Exist Asph Pavt 3 1/2 Avg Depth
	200-299           300-341           0315         1           0315         1           0315         1           0315         1           0315         1           0315         1           0315         1           0315         1           0315         1           0327         70           0327         70

6. Select the **0337 7 25** box.

0337 7 25 Asphalt Concrete Friction Course, Inc Bit, FC-5, PG 76-22

- 7. Click the X to close the box, don't worry your selection is still picked.
- 8. Select the SR61 alignment.
- 9. Select **Compute Takeoff** to execute the report.
- 10. The report viewer opens, change the report type to *Count Takeoff Report* to see the quantity of the Friction Course only.

Notice the busy drawing with all the labels which represent a different shape. The pay item filters are a useful tool to narrow down a report on a specific pay item number as opposed to running a report and having to parse to the desired object.



- 11. Open the *Pay Item Filters* dialog and select **Clear Selection**. You will need to do this before you run an overall report, since the selections will remain until they are cleared.
- 12. Save and close the *qtdsrd01.dwg* drawing before continuing.

#### Exercise 8.8 Running a Report with a Xref and Drainage Networks

In this exercise, the designer will run a report on the Drainage Network that had Xdata appended to it using EMX. The designer will use the dsgnrd01 file to Xref in the drainage file for this scenario.

- 1. Open the *dsgnrd01.dwg* file.
- 2. Type in **Xref** on the command line to bring up Xref Manager.
- 3. Click on the dwg attach button on the upper left of the dialog.
- 4. Browse to the *drprrd01.dwg* file located in the drainage folder in your project.
- 5. Make sure Overlay is toggled. Match the image below.

lame:	DRPRRD01	<ul> <li>✓ Brows</li> </ul>	se
Previe		Scale         Specify On-screen           X:         1.00           Y:         1.00           Z:         1.00           Uniform Scale	Path type Relative path Rotation Specify On-screen Angle:
Refere O Atta	ance Type achment	Insertion point           Specify On-screen           X:         0.00           Y:         0.00           Z:         0.00	Block Unit Unit: Unitless Factor: 1

6. Select **OK**. The drawing should look like image below.



- 7. Open FTM if not already open.
- 8. On the *Quantity Reports* tab select **SR61** for the alignment.
- 9. Toggle on Include Drainage Items and Include Xref Files

FDOT TAKEOFF MANAGER	
File	2
Report Extents	eport
Current Drawing ~	ity R
	Quant
Extents Filtering	0
Alignment	s
SR61 ~	Table
Start Station: 698+53.79'	many
End Station: 726+41.49'	Sum
Left Offset Distance: 99999'	
Right Offset Distance: 99999'	
Output Options	
Include EntityManager Placed Items	
✓ Include Non-Alignment Associated Items	
☑ Include Drainage Items	
☑ Include Xref Files	
🖂 Output Upper Case	

- 10. Select **Compute Takeoff** to execute the report.
- 11. Save and Close your file.

The report not only shows the Drainage Network parts, it also shows the appended sod and steel quantities to the outlet structures that you placed using EMX in an earlier chapter.

# **9** LINKING SUMMARY REPORTS

# **O**BJECTIVES

The objective of this chapter is to teach the designer how to link summary reports to the appropriate design files. The designer will also learn editing techniques and proper workflow when working with tables and editing excel files. The designer will learn how to create a Summary of Pay Items plan.

## **INTRODUCTION**

This section will cover using Autodesk's Data Link Manager to properly link the reports that were run earlier to the appropriate design file. The linked files are treated like reference files, which are accessible in Xref Manager. The designer will also see how edits to the excel file are automatically updated to the design file table, also how to edit the table and the data gets transferred to the original spreadsheet report.

## TABLE COMMAND

You can either type in **Table** on the command line or click on the *Table* button located on the FDOT ribbon on the Quantities panel. When selected the Insert Table dialog box opens.

Table style Legend	~ <b>&gt;</b>		Insertion behavior Specify insertion point	
Insert options			Column & row settings	
Start from er	mpty table		Columns:	Column width:
O From a data No data links	link Found V	1	5 •	2.5
From object	data in the drawing (D	ata Extraction)	Data rows:	Row height:
- FIEWEW				
v rieview			Set cell styles	
Handar	7k/e	Honder	Set cell styles First row cell style:	Title V
Header	Thie Header	Header	Set cell styles First row cell style: Second row cell style:	Title V Header V
Header Data	Thie Header Data Data	Header Data Data	Set cell styles First row cell style: Second row cell style:	Title V Header V
Header Data Data Data	Thie Header Data Data Data	Header Data Data Data	Set cell styles First row cell style: Second row cell style: All other row cell styles:	Title V Header V Data V
Header Data Data Data Data	Thie Header Data Data Data Data	Header Data Data Data Data	Set cell styles First row cell style: Second row cell style: All other row cell styles:	Title ~ Header ~ Data ~
Header Data Data Data Data Data	Thie Header Data Data Data Data Data	Header Data Data Data Data Data Data	Set cell styles First row cell style: Second row cell style: All other row cell styles:	Title ~ Header ~ Data ~
Header Data Data Data Data Data	Thie Header Data Data Data Data Data	Header Data Data Data Data Data Data Data	Set cell styles First row cell style: Second row cell style: All other row cell styles:	Title ~ Header ~ Data ~
Header Data Data Data Data Data Data	Tkie Header Date Date Date Date Date Date Date	Header Data Data Data Data Data Data Data Dat	Set cell styles First row cell style: Second row cell style: All other row cell styles:	Title ~ Header ~ Data ~

Let's look at the options available;

• **Table Style** – You can either start from a scratch and design a custom table or use the pull down and see a list of FDOT AutoCAD tables that match the Excel spreadsheets that are delivered with the state kit.



#### • Insert Options

- Start from empty table Starts a new table from the default style.
- **From a data link** clicking on this opens the data link manager dialog, which allows the user to link a spreadsheet to a drawing file.
- **From object data in the drawing (Data Extraction)** Allows the user to window everything in the active drawing file that has data and puts it in a table and places it in the drawing file.
- **Preview** Shows a preview of the table that will be placed.
- Insertion behavior
  - Specify insertion point allows user to specify an exact point for the table to be inserted.
  - **Specify window** allows user to draw a window in the drawing file that will be the location of the table placement.
- Column & row settings this controls are used to build a custom table for use in the drawing file.
- Set cell styles these controls used in conjunction with the above controls are used to build a custom table for data entry.

For additional information, select the Help button to access the Autodesk Help Knowledge base.

Home	2018 - Help					- 0	1
Help Home					Sign In	<b>()</b> Er	glisł
AUTOD	ESK" <b>A</b> l	ITOCAD	• CIVIL 3D 201	.8 Q Entr	er a keyword		
Insert Table [	Dialog Box	p.				< SH	ARE
Creates an empty ta	ble object.						
A Insert Table					1		
Table style Standard	• 🖸		Insertion behavior © Specify insertion point © Specify gindow				
Insert options Start from empty : From a data ink	table		Column & row settings Columns:	Column wigth:			
7io data links foun	d ~ [83]		u . 🔅	2.5000			
🗇 Prom object data i	n the drawing (Data	Extraction)	Data (ows:	Row height:			
Preview			E 1 🔄	1 🕀 Line(s)			
	Title		Set cell styles				
Header	Header	Header	Prist row cer style:	Tide •			
Data	Data	Data	Second row cell style:	Header 🔹			
Data.	Data	Data	All other row cell styles:	Data •			
Data	Data	Data		Contraction of the second			
Data	Data	Data					
Data	Data	Data					
Data	Do to.	Data					
Data	Data	Data					
Doto	Doto	Data					

## FDOT SUMMARY BOX FILE LOCATION

The FDOT Civil 3D State Kit is delivered with an abundance of resources that the designer can use (blocks, templates, layer standards, etc.), but also there are already formatted excel spreadsheets that make up the summary boxes.

#### **Exercise 9.1** Accessing the location of the Summary Boxes and Reports

- 1. To access the location in a fast way with the state kit open, switch to the FDOT ribbon.
- 2. Select the Links/Contacts.
- 3. Pull down the Engineering Links and select Explore FDOT20xx.C3D Directory

🕖 Contacts And Links		
<ul> <li>Engineering Links</li> </ul>	▼ CADD Resources	CADD Go
FDOT Standard P	lans	3
Plans Preparation	Manual (PPM)	
Explore FDOT201	8.C3D Directory	
AASHTO Home P	age	15
FDOT Basis of Est	imates Manual (BOE)	

4. Browse to the following location.

OSDisk <mark>(C</mark>	) > FDOT2018.C3D > Data > Templates	> XLSX >	
	Name	Date modified	Туре
	🛃 Computation Summary Boxes	3/28/2018 7:30 AM	File folder
ж	🛃 Geotechnical	3/28/2018 7:30 AM	File folder
Ŕ	🔊 Right of Way	3/28/2018 7:30 AM	File folder
*	on Roadway	3/28/2018 7:30 AM	File folder
*	Structures	3/28/2018 7:30 AM	File folder
*	national Summary Reports	4/5/2018 2:59 PM	File folder

5. Explore each folder and discover what is available, for instance in the *Computation Summary Boxes* folder is the bulk of the Summary boxes that you will use to copy and paste from the Report Viewer reports.

The Summary Reports folder contains the reports used with the automated reports, such as asphalt and sod for example. It is recommended that you do not modify the reports in this folder since it has an accompanying xml file that is reads.

#### Exercise 9.2 Linking Summary of Sidewalk & Detectable Warnings report

In this exercise, the designer will link the summary of Sidewalk & Detectable Warnings report using the data link manager in the sheet that created in the previous exercise.

- 1. Open the *sumqrd01.dwg* file and remain in paper space.
- 2. Make **Tables\_dp** the current layer, you can type the name on the command line and press enter for a shortcut.
- 3. On the FDOT Ribbon select the **Table** command.
- 4. Using the same steps from Chapter 7 and using the diagram with the sequence of steps shown below, select *From a data link* and open DLM.
- 5. Click on *Create a new Excel Data Link* to create the linked name.

6. For Data Link Name type in Sidewalk.

Table style		A Select a Data Link		×			
Standard							
Insert options		Links:	2				
Start from empty t	able	Create a new Exce	Data Link		Column width:		
From a data link					2.5		
No data links found	4 V						
From object data in	n the drawing				Row height:		
Preview	_			A Enter Data Li	nk Name		
Preview	This	- Details		A Enter Data Li	nk Name		
Preview Header	Thie Heade	Details	, ,	Enter Data Li	nk Name		
Preview Header Data	Thie Heade Dota	Details No details a	ivailable.	A Enter Data Li	nk Name Sidewalk	ок	Cancel
Preview Heador Data Data	Thie Heade Data Date	Details No details a	ivailable.	A Enter Data Li Name:	nk Name	ок	Cancel
Preview Heador Data Data Data	Thie Heade Data Date Date	Details No details a	ivailable.	A Enter Data Li Name:	nk Name	ок	Cancel
Preview Header Data Data Data	Thie Heads Data Data Data	Details No details a	ivailable.	A Enter Data Li Name:	nk Name Sidewalk	ок	Cancel
Preview Heador Data Data Data Data	Thie Heads Data Data Data Data	Details No details a	available.	A Enter Data Li	Sidewalk	ОК	Cancel
Preview Heador Data Data Data Data Data	Thie Heads Data Data Data Data	Details No details a	available.	A Enter Data Li	nk Name Sidewalk	ок	Cancel
Preview Header Header Data Data Data Data Data Data Data Dat	Thie Heade Date Date Date Data Data Data	Details No details a	wailable.	A Enter Data Li	sidewalk	OK	Cancel

- 7. Select OK.
- 8. Select the Ellipse button to browse to the excel file which is located in the *Calculations* folder in your project.
- 9. Select the Summary\_of\_Sidewalk (11hr 11min 28sec).xlsx file and press **Open**. Keep in mind the time stamp will be different on each report, so as to not over write an existing report.
- 10. Select **OK** until you see the word Table on the command line, this means that the table is loading and to be patient.
- 11. The table is attached to your cursor, select the upper left corner of the border for placement.
- 12. The table is longer than the 11x17 FDOT border, open the spreadsheet and delete 12 rows.
- 13. Save and close the spreadsheet.
- 14. Upon returning to the drawing file you should see a notification message in the bottom right corner of the screen letting you know the link has changed and do you want to update the link, select the blue link to perform the update. The table when the update process is complete should show the 12 rows deleted.

			SUM	ARY OF S	I DEWALK	& DETECTAE	LE WARNIN	65		
						CONC 5	DEWALK			
LOCATI	OW	5105	AREA	15	13	0.52	2 1	DESTGN	CONSTRUCTION	
		1 3100	10	121	110	5	Y	NOT ES	REWARKS	
51A. 10	STA.					Ρ	F			
	_		_	<u> </u>						
 			<u> </u>		<u> </u>	<u> </u>				
_			<u> </u>			<u> </u>				
-+			<u> </u>	<u> </u>	<u> </u>	<u> </u>				
$\rightarrow$			<u> </u>							
 +			<u> </u>	<u> </u>	<u> </u>	<u> </u>				
 -+			<u> </u>	<u> </u>	<u> </u>	<b> </b>				
-			<u> </u>			<u> </u>				
 			<u> </u>		<u> </u>	<u> </u>				
-+			<u> </u>			——				
-+			<u> </u>	<u> </u>		<u> </u>				
_			<u> </u>							
			<u> </u>			<u> </u>				
							DEPARTN	TATE OF FLORIDA ENT OF TRANSPORTATION	I SCALE	

- 15. Right click on the 1 Scale layout and rename it to Sidewalk.
- 16. Save the file before continuing.

#### **Exercise 9.3** Linking the Summary of Guardrail report

In this exercise, the designer will copy the Sidewalk layout and link the Summary of Guardrail report to the design file, but this time it will be in model space as opposed to paper space.

- 1. Right click on the Sidewalk layout and create a copy and move it to the right of the sidewalk layout.
- 2. Right click and rename it to Guardrail.

Model Layout1 Sidewalk Guardrail

- 3. For this exercise, switch to the model tab.
- 4. Repeating steps 3-10 above link the Summary of Guardrail report located in your calculations folder.
- 5. For placement, left click anywhere on the screen.
- 6. Zoom extents to see the entire table.
- 7. Switch to the *Guardrail* tab and delete the copy of the sidewalk table.
- 8. Click on Model to change it to paper
- 9. Double click in the border to activate the view port.
- 10. Click on the blue lock to unlock the viewport.
- 11. Zoom extents to bring the table into the border.
- 12. Pan to move the table to the left side of the sheet, zoom out and then zoom window with a little padding around the table so it won't be touching the sheet border.

	SUMMAR OF GUARDRAIL		N
			ТОР
			S
			WCS 🗢
×			
	! !:	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION	I SCALE
			1 DUALD

13. When the placement is suitable click on the lock to return the view port to its previous state.

14. Save and close the drawing before continuing.

## Exercise 9.4 Running a Summary of Pay Items Report

In this exercise, the designer will take a formatted sample report that was taken from designer interface and using the TRNS\*port Sheets command will create an automated report that is added to sheets as it runs.

- 1. With the FDOT Civil 3D State kit open, switch to the FDOT ribbon.
- 2. Click on the *Create File* application.
- 3. Make the following selections as shown below.

Create File (v201	8.0.3.9)	×
Project: C:\	ve∖projects\FDOT C3D Quantities\FDOT C3D Quantities Cr ∨	Select Project
Discipline: RC	DADWAY ~	
File Group: Ro	adway Design Files 🗸 🗸	
File Type:		
Selective Clearin Signature Sheet Signature Sheet Signature Sheet Signature Sheet Special Details 3 Summary of Pay Summary of Verflie Survey of Verflie Survey of Verflie Survey of Verflie Text Labels and Topography - Ex Traffic Control D Traffic Control D	ng and Grubbing Sheet - Core Borings - Project Control - Verfied Utilities Sheet Item Sheets Intilies Sheets Intilies 3D Version of UTEXRD.dgn d Utilities 3D Version of UTEXRD.dgn Miscellaneous Descriptions isting - Utility and Drainage Not Included esign es	
Traffic Control G	eneral Note Sheets	¥
Output File:	CESSRD01.dwg	
Output Folder:	roadway\	Browse
Template:	planrd.dwt	Browse
Template Path:	data/templates/	
Coordinate Syste	em: FL North V	
Create/	/Open File	Close

- 4. Select Create/Open File.
- 5. Select **Close** to exit dialog box.
- 6. You will see a 1 Scale sheet layout already in the file and the North Arrow has already been deleted.
- 7. Right Click on the layout and rename to Summary of Pay Items.
- 8. On the FDOT Ribbon select **TRNS\*port Sheets** located in the Quantities panel.
- 9. The TRNS\*port dialog box opens.

FDOT TRNS*port	3.01.00	-		Х
Input File:			Browse.	
County:	~			
Financial Number:	~			
Template Layout:	~			
Add Sheets t	o Sheet Set			
Sheet Set DST:				**
Sheet Subset:		$\sim$		
Sheet Title:				
	Starting Sheet Number: 1			
	Load Summary of Pay Items			

- 10. For Input file, click the browse button.
- 11. Navigate to the calculations folder in your project and select the T8888.xml file.

😽 « FDC	T C3D Quantities > FDOT C3D Quantitie	es Complete > 22049555201 >	calculations
New folder			
Repor ^	Name	Date modified	Туре
	T8888.xml	4/13/2016 11:57 AM	XML Document

- 12. The dialog auto populates with *Input file, County, & Financial Number*. There is a pulldown that would allow you to pick optional data if available.
- 13. For *Template Layout* select **Summary of Pay Items** using the pull-down button. This will use the sheet layout and copy it as required by the length of the report.

	C:\e\projects\FDOTC3D Quantities\FDOTC3D Quantitie	Browse
County:	LEON ~	
Financial Number:	000000-0-00-00 ~	
Template Layout:	Summary of Pay Items $\sim$	
Sheet Set DST:		Browse
Sheet Subset:	~	
Sheet Subset: Sheet Title:	SUMMARY OF PAY ITEMS	
Sheet Subset: Sheet Title:	SUMMARY OF PAY ITEMS Starting Sheet Number: 1	

- 14. Select Load Summary of Pay Items to execute the report.
- 15. Click **OK** on the report information dialog.
- 16. Close the TRNS\*port application.
- 17. Save the file.

At this time, the application will run and notice the 3 sheet layouts along the bottom, since you renamed the layout to its common name the sheet numbers make more sense now from this point you would add them to existing sheet sets as you have from the traffic plan manual. The reports look as follows;

Labela De Examinator de Tradescentration           Partici - Construction         Construction           Partici - Construction         Partici - Construction				04/13/2	2016 11:57:11 AM						
Data Projecti 0         Data Projecti 0         Construction           Part ALI Fern Number         Dott Number 0         Dott Number 0         Dott Number 0           Part ALI Fern Number         Dott Number 0         Dott Number 0         Dott Number 0           Part ALI Fern Number         Dott Number 0         Dott Number 0         Dott Number 0           Part ALI Fern Number 1         Dott Number 0         Dott Number 0         Dott Number 0           Part ALI Fern Number 1         Dott Number 0         Dott Number 0         Dott Number 0           Part ALI Fern Number 1         Dott Number 0         Dott Number 0         Dott Number 0           Part ALI Fern Number 1         Dott Number 0         Dott Number 0         Dott Number 0         Dott Number 0           Part ALI Fern Number 1         Dott Number 0           Part Number 0         Part Number 0         Dott Number 0 <td></td> <td></td> <td>FLORIDA DEPARTMENT OF TRANSPORTATION PROPOSAL SUMMARY OF PAY ITEMS</td> <td>04/12/2</td> <td>210 11 27.11 16</td> <td></td> <td></td> <td></td> <td></td> <td></td>			FLORIDA DEPARTMENT OF TRANSPORTATION PROPOSAL SUMMARY OF PAY ITEMS	04/12/2	210 11 27.11 16						
Bart FGS         County 7: Lise         County 7: Lise           21         JII FES MINIST         Cool Standard         TO DOCUMENT TO TARK           21         JII FES MINIST         Cool Standard         TO DOCUMENT TO TARK           20         Cool Standard         TO DOCUMENT TO TARK         TO DOCUMENT TO TARK           21         Cool Standard         TO DOCUMENT TO TARK         TO DOCUMENT TO TARK           21         Cool Standard         TO DOCUMENT TO TARK         TO DOCUMENT TO TARK           21         Cool Standard         TO DOCUMENT TO TARK         TO DOCUMENT TO TARK           21         Cool Standard         TO DOCUMENT TO TARK         TO DOCUMENT TO TARK           21         Cool Standard         TO DOCUMENT TO TARK         TO DOCUMENT TO TARK           21         Cool Standard         TO TARK         TO DOCUMENT TO TARK         TO DOCUMENT TO TARK           21         TO TARK         TO TARK         TO DOCUMENT TO TARK         TO DOCUMENT TO TARK         TO DOCUMENT TO TARK           21         TO TARK         TO TARK         TO DOCUMENT TO DOCUME	EAD PRO	1/FCT - 000000-	POR PROPOSAL: 18866	0	UNTY/SECTION :						
0000         Description         Description           1         Differ         Differ <td>ROJECT(S</td> <td>S): 000000000</td> <td>000 COUNTY : LEON</td> <td></td> <td>unity been long to</td> <td></td> <td></td> <td></td> <td></td> <td></td>	ROJECT(S	S): 000000000	000 COUNTY : LEON		unity been long to						
Clin Line Humber         If the HARCH CHINE OF LINE OF			0003 SUMMARY OF SIGNING								
0000-1-         MARE RAVE: 01 TABASC.         157         1.000           0700-1-         MARE RAVE: 01 TABASC.         64         152 / 000           0700-1-         MARE STREEMEN DAMAGNO, WHTE, SOLD FOR         M         7.744           0700-1-         MARE STREEMEN DAMAGNO, WHTE, SOLD FOR         M         7.744           0710-1-         MARE STREEMEN DAMAGNO, WHTE, SOLD FOR         JE 22000         723.000           0710-1-         MARE STREEMEN DAMAGNO, WHTE, SOLD FOR         JE 2010         10000           0710-1-         MARE STREEMEN DAMAGNO, WHTE, SOLD FOR         JE 2010         10000           0710-1-         MARE STREEMEN DAMAGNO, WHTE, SOLD FOR         JE 2000         120000           0710-1-         MARE STREEMEN DAMAGNO, WHTE, SOLD FOR         JE 2000         220000           0710-1-         MARE STREEMEN DAMAGNO, TELLOR, SOLD FOR         JE 2000         220000           0710-1-         MARE STREEMEN DAMAGNO, TELLOR, SOLD FOR         JE 20000         220000           0710-1-         MARE STREEMEN DAMAGNO, TELLOR, SOLD FOR         JE 20000         220000           0710-1-         MARE STREEMEN DAMAGNO, TELLOR, SOLD FOR         JE 20000         220000           0710-1-         MARE STREEMEN DAMAGNO, TELLOR, SOLD FOR         JE 20000         220000	PC ALT	ITEM NUMBER	ITEM DESCRIPTION UP	00000000000000000000000000000000000000	QUANTITY TOTAL						
0006-3.         BETRAFALCTIVE AVAPERATING THAT AND USES         A         1527.000           0710-11:11         FILE IS SQUARE         MARKED SPARESER         MARKED SPARESER           0710-11:12         FILE IS SQUARE         MARKED SPARESER         MARKED SPARESER           0710-11:12         FILE IS SQUARE         MARKED SPARESER         MARKED SPARESER           0710-11:12         MARKED SPARESER         MARKED SPARESER         MARKED SPARESER           0710-11:12         MARKED SPARESER         MARKED SPARESER         MARKED SPARESER           0710-11:12         MARKED SPARESER         MARKED SPARESER         A         0.000           0710-11:12         MARKED SPARESER         MARKED SPARESER         A         0.000         0.000           0710-11:12         MARKED SPARESER         MARKED SPARESER         A         0.000         0.000           0710-11:12         MARKED SPARESER         MARKED SPARESER         A         0.000         0.0000           0710-11:22         MARKED SPARESER         MARKED SPARESER         MARKED SPARESER         A         0.000         0.0000           0710-11:22         MARKED SPARESER         MARKED SPARESER         MARKED SPARESER         A         0.000         0.0000           0710-11:22         MARKED S		0102- 1-	MAINTENANCE OF TRAFFIC (L.	S) 1.000	1.000						
0710-11-11         0711-01-0712-03         0712-01-072         0712-01-072           0710-11-12         0712-01-072         0712-01-072         0712-01-072         0712-01-072           0710-11-12         0712-01-072         0712-01-072         0712-01-072         0712-01-072           0710-11-12         0712-01-072         0712-01-072         0712-01-072         0712-01-072           0710-11-12         0712-01-072         0712-01-072         0712-01-072         0712-01-072           0710-11-12         0712-01-072         0712-01-072         0712-01-072         0712-01-072           0710-11-12         0712-01-072         0712-01-072         0712-01-072         0712-01-072           0710-11-12         0712-01-072         0712-01-072         0712-01-072         0712-01-072           0710-11-12         0712-01-072         0712-01-072         0712-01-072         0712-01-072           0710-11-02         0712-01-072         0712-01-072         0712-01-072         0712-01-072           0710-11-02         0712-01-072         0712-01-072         0712-01-072         0712-01-072           0711-01-072         0712-01-072         0712-01-072         0712-01-072         0712-01-072           0711-01-072         0712-01-072         0712-01-072         0712	A	0706- 3-	RETRO-REFLECTIVE PAVEMENT MARKERS E/	4 1527.000	1527.000						
0710-11-12         PANED PAREMENT MARKING, STANDARD, WHITE, SULD TOR         1/2         2723.000           0710-11-12         MARTED PAREMENT MARKING, STANDARD, WHITE, SULD TOR         1/2         1/80.000           0710-11-12         MARTED PAREMENT MARKING, STANDARD, WHITE, SULD TOR         1/2         6.86.000           0710-11-12         MARTED PAREMENT MARKING, STANDARD, WHITE, SULD TOR         1/2         6.86.000           0710-11-12         MARTED PAREMENT MARKING, STANDARD, WHITE, SULD TOR         1/4         6.84.2         6.541           0710-11-12         MARTED PAREMENT MARKING, STANDARD, WHITE, SULD TOR         1/4         6.000         60.000           0710-11-12         MARTED PAREMENT MARKING, STANDARD, WHITE, SULD TOR         1/4         6.000         60.000           0710-11-12         MARTED PAREMENT MARKING, STANDARD, WHITE, MARKING, STANDARD, TELLIW, SULD TOR         1/4         7.335         7.335           0710-11-20         MARTED PAREMENT MARKING, STANDARD, TELLIW, SULD TOR         1/4         7.300         60.000           0710-11-20         MARTED PAREMENT MARKING, STANDARD, TELLIW, SULD TOR         1/4         7.300         7.335           0710-11-20         MARTED PAREMENT MARKING, STANDARD, TELLIW, SULD TOR         1/4         7.300         61.1300           0710-11-20         MARTED PAREMENT MARKING, STANDARD, TEL		0710- 11-111	PAINTED PAVEMENT MARKINGS, STANDARD, WHITE, SOLID, 6" NO **** ITEM IS OBSOLETE **	1 7.784	7.784						
0710:11-12         07112:01 AVERENT MARKING, STANDARD, WHITE, SULD FOR LF         108.000           0710:11-12         07112:01 AVERENT MARKING, STANDARD, WHITE, SULD FOR LF         6.86.000           0710:11-12         07112:01 AVERENT MARKING, STANDARD, WHITE, SULP, ME         6.86.000           0710:11-12         07112:01 AVERENT MARKING, STANDARD, WHITE, MISSING, STANDARD, WHITE, MISSING, M		0710- 11-123	PAINTED PAVEMENT MARKINGS, STANDARD, WHITE, SOLID FOR LF CROSSWALK AND ROUNDABOUT, 12"	2733.000	2733.000						
0710         11-12         [Million Devices and mark toos, 37 MADARD, MILL, SULD FOR LF         686.000         685.000           0710         11-12         [Didlion Devices and mark toos, 37 MADARD, MILL, SULD FOR LF         64         6.541         6.541           0710         11-12         [Didlion Devices and mark toos, 57 MADARD, MILL, MESSOFE         64         60.000         60.000           0710         11-10         [Didlion Devices and mark toos, 57 MADARD, MILL, MESSOFE         64         60.000         60.000           0710         11-10         [Didlion Devices and mark toos, 57 MADARD, MILL, MESSOFE         64         60.000         60.000           0710         11-12         [Million Devices and mark toos, 57 MADARD, MILL, MESSOFE         64         80.000         60.000           0710         11-22         [Million Devices and mark toos, 57 MADARD, TELLOR, ISLAND, 57 MADARD, TELLOR, ISLAND, 56         54         90.000         258.000           0710         11-22         [Didlion Park terms toos, 57 MADARD, TELLOR, ISLAND, 56         54         90.000         50.000           0710         11-22         [Didlion Park terms toos, 57 MADARD, TELLOR, ISLAND, 57 MADARD, TELLOR, ISLAND, 57 MADARD, TELLOR, ISLAND, 57 MADARD, TELLOR, ISLAND, 57 MADARD, 57 MADARD, 76 MILL, 50 MILL, 5		0710- 11-124	PAINTED PAVEMENT MARKINGS, STANDARD, WHITE, SOLID FOR DIAGONAL OR CHEVRON, 18	108.000	108.000						
0700-11-10         PARTED AVERSENT MARKINGS STRUDIO. WHITE, SCIP., 40         6.541         6.541           0710-11-10         PARTED AVERSENT MARKINGS STRUDIO. WHITE, JABONS         6.8         80.000         40.000           0710-11-10         PARTED AVERSENT MARKINGS STRUDIO.         WHITE AVERSENT MARKINGS STRUDIO.         7.335         7.335           0710-11-10         PARTED AVERSENT MARKINGS STRUDIO.         VELIANDO.         VELIANDO.         VELIANDO.         7.335           0710-11-21         VELIANDO.         VELIANDO.         VELIANDO.         VELIANDO.         VELIANDO.         VELIANDO.         VELIANDO.           0710-11-21         VELIANDO.		0710- 11-125	PAINTED PAVEMENT MARKINGS, STANDARD, WHITE, SOLID FOR STOP LINE OR CROSSWALK, 24"	636.000	636.000						
0710         11-10         PARTY PARAMET         <		0710- 11-131	PAINTED PAVEMENT MARKINGS, STANDARD, WHITE, SKIP, 10-30 OR 3-9 SKIP, 6" WIDE	6.541	6.541						
0710         11-17         PARTED PAYERER TARKOS, STANDAR, FELLA, SANDA         90.000         90.000           0710         11-17         PARTED PAYERER TARKOS, STANDARD, FELLA, SOLD, 6"         MI         12.33         12.33           0710         11-20         PARTED PAYERER TARKOS, STANDARD, FELLA, SOLD, 6"         MI         2.38         0.33           0710         11-20         PARTED PAYERER TARKOS, STANDARD, FELLA, SOLD, 6"         MI         2.38         0.41           0710         11-20         PARTED PAYERER TARKOS, STANDARD, FELLA, SOLD, 6"         MI         2.38         0.41           0710         11-20         PARTED PAYERER TARKOS, STANDARD, FELLA, SOLD, 6"         SA         40.90         50.00           0710         11-20         PARTED PAYERER TARKOS, STANDARD, FELLA, SOLD         SA         49.900         41.900           0710         11-20         PARTED PAYERER TARKOS, STANDARD, FELLA, SOLD         SA         0.001         30.000           0715         1.50         PARTED PAYERER TARKOS, STANDARD, FELLA, SOLD         COMPTY SECTOR         0.001         30.000           0715         1.50         PARTED PAYERER TARKOS, STANDARD, FELLA, SOLD         COMPTY SECTOR         0.012/2016.1152/11.401           PARTED PAYERER TARKOS, STANDARD, FELAS, SOLD         COMPTY SECTOR		0710- 11-160	PAINTED PAVEMENT MARKINGS, STANDARD, WHITE, MESSAGE E/ OR SYMBOL	4 80.000	80.000						
0710-11-21         PAULE PAULE PAULE PAULES, STADUMO, TELLOR, SOLID. 6"         W         7.335         7.235           0710-11-23         PAULE PAULES, MANKING, STADUMO, TELLOR, SOLID. 70         V         258.000         258.000           0710-11-24         PAULE PAULES, STADUMO, TELLOR, TSADU         SF         491.500         491.500           0710-11-23         PAULE PAULES, STADUMO, TELLOR, TSADU         SF         491.500         491.500           0715-1-24         PAULE PAULES, STADUMO, TELLOR, TSADU         SF         491.500         50.000           0715-1-20         PAULE PAULES, STADUMO, TELLOR, TSADU         SF         491.500         50.000           0715-4-01         PAULE PAULES, STADUMO, TELLOR, TSADU         SF         491.500         50.000           FAULES, STADUMO, AND PAULES, STADUMO, TELLOR, TSADU         SF         491.500         50.000           FAULES, STADUMO, AND PAULES, STADUMO, TELLOR, TSADU         SF         491.500         50.000           FAULES, STADUMO, AND PAULES, STADUMO, TELLOR, TSADU         SF         491.500         50.000           FAULES, STADUMO, TAULES, STADUMO, TELLOR, TSADU         STADUMO, TAULES, S		0710- 11-170	PAINTED PAVEMENT MARKINGS, STANDARD, WHITE, ARROWS EA	90.000	90.000						
0710-11-22         PARTER TO PARTER TO TARKINGS, STADARD, TELLOR, ISLAND, SP.         258.000         258.000           0710-11-20         DOLGAUL, OK CHARGE, STADARD, TELLOR, ISLAND, SP.         54         491.900         491.900           0710-11-20         DOLGAUL, OK CHARGE, STADARD, TELLOR, ISLAND, SP.         54         491.900         491.900           0715-4-01         LIGHT PULCEARMER, FAS, STRECIA, FORMATION, BSPEED         64         900         50.000           10071-5-4-01         LIGHT PULCEARMER, FAS, STRECIA, FORMATION, BSPEED         64         90.000         50.000           FLORIDAL EFFAS, STRECIA, FORMATION, THOM, TOTAL EFFAS, STRECIA, FORMATION, THOM, TOTAL EFFAS, STRECIA, FORMATION, TOTAL EFFAS, STRECIA, STREE, STREE, STRECIA, STREE, STR		0710- 11-211	PAINTED PAVEMENT MARKINGS, STANDARD, YELLOW, SOLID, 6" NO *** ITEM IS OBSOLETE **	1 7.335	7.335						
0710-11-700         PMAILED PAREMENT MARKINGS, STANDARD, TELLIN, TISAND         Sr         491.900         491.900           0715-4-017         PSOL		0710- 11-224	PAINTED PAVEMENT MARKINGS, STANDARD, YELLOW, SOLID FOR LF DIAGONAL OR CHEVRON, 18"	258.000	258.000						
0715         4-011         ISOT POLIC COMPETE AGL SPECIAL POLICIDATION WIND SPEED         Ex         90.000         90.000           OUT SOL POLIC COMPETE AGL SPECIAL POLICIDATION WIND SPEED         Ex         90.000         90.000           OUT SOL POLICIDATION         OUT SOL POLICIDATION           POLICIC CONDUCTOR SEGMENTIATION           POLICIC CONDUCTOR SEGMENTIATION <td colspa<="" td=""><td></td><td>0710- 11-290</td><td>PAINTED PAVEMENT MARKINGS, STANDARD, YELLOW, ISLAND</td><td>491.900</td><td>491.900</td><td></td><td></td><td></td><td></td><td></td></td>	<td></td> <td>0710- 11-290</td> <td>PAINTED PAVEMENT MARKINGS, STANDARD, YELLOW, ISLAND</td> <td>491.900</td> <td>491.900</td> <td></td> <td></td> <td></td> <td></td> <td></td>		0710- 11-290	PAINTED PAVEMENT MARKINGS, STANDARD, YELLOW, ISLAND	491.900	491.900					
ALL         DATI Description           PLANTAGE OF TRANSPORTATION         PARTICLE STATION           PAD PROJECT - 000000-0-00-00         DISTRICT: 00           PAD PROJECT - 000000-0-00-00         DISTRICT: 00           PROFERENTIAL SUBJECT - 00         COUNTY/SET DRI- TORSETTS: 0000000000           PROFERENTIAL SUBJECT - 00         COUNTY/SET DRI- TORSETTS: 00000000000           PROFERENTIAL SUBJECT - 000         DISTRICT: 00           PROFERENTIAL SUBJECT - 000         DISTRICT - 000           PROFERENTIAL SUBJECT - 000         DISTRICT - 000           PROFERENTIAL SUBJECT - 000000000000         DISTRICT - 00000000000000000000000000000000000		0715- 4-011	LIGHT POLE COMPLETE, F&I, SPECIAL FOUNDATION, WIND SPEED	1 50.000	50.000						
Classical displaymentari displaymentaria         Out 322016.1152-111.00           Presso         Presso         Presso           Presso         Country displaymentaria         Country Section           Presso         Displaymentaria         Displaymentaria           Displaymentaria         Displaymentaria         <	r I	0715- 1- 12 0715-515-145	LIGHTING CONDUCTORS, F&I, INSULATED, NO.8 - 6 LF LIGHT POLE COMPLETE- SPECIAL DESIGN, F&I, SINGLE ARM EA BRIDGE MOUNT-ALUMINUM, 49	200.000 1 3.000	200.000 3.000						
Bill Bill Construction         Dist N (Construction)         Dist N (Construction)         Construction           Bill Bill Construction         Dist N (Construction)         Dist N (Construction)         Construction         Construction           VC ALT (First Nonscent)         First Nonscent)         First Nonscent)         First Nonscent)         First Nonscent)         First Nonscent)           06402 - 31 - 60         Statistical Annual Construction         Statistical Annual Construction         First Nonscent)         First Nonscent)           06464 - 31 - 60         Bill Statistical Annual Construction         Statistical Annual Construction         First Nonscent)         First Nonscent)           06464 - 31 - 60         Bill Statistical Annual Construction Statistical Annual Construction (Bill Statistical Annual Construction)         First Nonscent (Bill Statistical Annual Construction)         First Nonscent (Bill Statistical Annual Construction)           06464 - 31 - 60         Bill Statistical Annual Construction (Bill Statistical Annual Construction)         First Nonscent (Bill Statistical Annual Construction)         First Nonscent (Bill Statistical Construction)           06464 - 31 - 60         Bill Statistical Annual Construction (Bill Statistical Annual Construction)         First Nonscent (Bill Statistical Construction)         First Nonscent (Bill Statistical Construction)           06464 - 31 - 60         Bill Bill Statistical Annual Construction (Bill Statistical Construction)         F			FLORIDA DEPARTMENT OF TRANSPORTATION	04/13/2	016 11:57:11 AM						
Openation         Openation         Openation         Openation           0.01         The number in the number i	EAD 000	LECT - 000000 -	FOR PROPOSAL SOMMAR OF PAR TENS		UNITY OF FOIL IN A						
C/LLT         TER         DESC         DESC <thdesc< th=""> <thdesc< th=""> <thdesc< th=""></thdesc<></thdesc<></thdesc<>	EAD PRO. ROJECTIS	)JECT : 0000004 5) : 000000000	FOR PROPOSAL SUMMAR OF PAR ITEMS FOR PROPOSAL: T8888 D=000-00 DISTRICT : 00 000 COUNTY : LEON	CO	UNTY/SECTION :						
0640         -2.1.2         EONDUT, FUNNISS 6. INSTAL, JACK 6. 8009: UDBR MAIRADO.         (F         11.000           0640         -1.0.00         MART, MARL 4.1.00, SPED-105.5MALE AMMURTH         6A         2.000           06465         -1.0.00         MART, MARL 4.1.00, SPED-105.5MALE AMMURTH         6A         1.000           06465         -1.0.01         MART, MARL 4.1.00, SPED-105.5MALE AMMURTH         6A         1.000         1.000           06465         -1.02         MART, MARL 4.1.00, SPED-105.5MALE AMMURTH         6A         1.000         1.000           06465         -1.02         MART, MARL 4.1.00, SPED-105.5MALE AMMURTH         6A         1.000         1.000           06465         -1.02         MART, MARL 4.1.00, SPED-105.5MALE AMMURTH         6A         1.000         1.000           06479         -1.02         MART, MARL 4.1.00, SPED-105.5MALE AMMURTH         6A         1.000         1.000           0649         -1.02         MART, MARL 4.1.00, SPED-105.5MALE AMMURTH         6A         1.000         1.000           0649         -1.02         MART, MARL 4.1.00, SPED-105.5MALE AMMURTH, 4A         5A         1.000         1.000           0650-1         -1.2         MART, MARL 4.1.000, MARTH, 4A         MARTH 4.1.000, MARTH 4.1.000, MARTH 4.1.000, MARTH 4.1.000, MARTH 4.1.000, MAR	EAD PROJ ROJECT(S	JECT : 000000- S) : 000000000	PROPOSAL SUBMINI OF PAT TERS FOR PROPOSAL TREES 0-00-00 DISTRICT : 00 000 COUNTY : LEON 0005 SUMMAR OF STGMALIZATION	CO	UNTY/SECTION :						
0649-31-10         MAXT, MIN, 45, WING. SPEED-105, SINGLE AMMUTITH         6A         2.000           0649-31-20, WINZ, MIN, 45, WING. SPEED-105, SINGLE AMMUTITH         6A         1.000         1.000           0649-31-20, WINZ, MIN, 46, WING SPEED-105, SINGLE AMMUTITH         6A         1.000         1.000           0649-31-20, WINZ, MIN, 46, WING SPEED-105, SINGLE AMMUTITH         6A         1.000         1.000           0649-31-20, WINZ, MIN, 46, WING SPEED-105, SINGLE AMMUTITH         6A         1.000         1.000           0649-31-20, WINZ, MIN, 46, WING SPEED-105, SINGLE AMMUTITH         6A         1.000         1.000           0649-31-20, WINZ, WINZ, MIN, 40, WINZ, WIN	EAD PROJ ROJECT(S	JECT : 000000- 5): 0000000000	PRDF03RL_SUBMUNIT UP PHTTENS     PRDF03RL_SUBMUNIT UP PHTTENS     PRDF02RL_T888     ODS     OD     OD     ODS     ODS     OD     OD     ODS     ODS     ODS     OD     OD     OD     OD     OD     ODS     ODS     OD	CO	UNTY/SECTION :						
0649-31-20         Hardf, 2019,44,1         HARD, 574,54,1         HARD, 574,1         HARD, 57	EAD PROJ ROJECT(S	DJECT : 0000004 5) : 0000000000 ITEM NUMBER 0630- 2-13		C0 VIT 000000000000000000000000000000000000	UNTY/SECTION : QUANTITY TOTAL 11.000						
0649-31-20         MAST. MMF4K. WINTS SFEED-105.SINGLE ADMUND LUMINING.         EA         1.000         1.000           0649-31-20         MAST. MMF4K. WINTS SFEED-105.SINGLE ADMUND LUMINING.         EA         1.000         1.000           0649-31-20         MAST. MMF4K. WINTS SFEED-105.SINGLE ADMUND LUMINING.         EA         1.000         1.000           0650-1-13         MAST. MMF4K. WINTS HE INTSTALL ALUMINUN, J. SECTION, AS         1.000         1.000           0650-1-13         FMFF1C SIGNAL, FUNDISH & INTSTALL ALUMINUN, J. SECTION, AS         1.000         1.000           0650-1-13         FMFF1C SIGNAL, FUNDISH & INTSTALL ALUMINUN, J. SECTION, AS         1.000         1.000           0650-1-13         FMFF1C SIGNAL, FUNDISH & INTSTALL ALUMINUN, J. SECTION, AS         1.000         1.000           0650-1-13         FMF1C SIGNAL, FUNDISH & INTSTALL ALUMINUN, J. SECTION, AS         1.000         1.000           0650-1-13         FMF1C SIGNAL, FUNDISH & INTSTALL ALUMINUN, J. SECTION, AS         1.000         1.000	EAD PROJ ROJECT(S	DJECT : 0000004 5) : 0000000000 1TEM NUMBER 0630- 2-13 0649-31-107	PORDERAL DUE TRANSITION TENS FOR PROFORM SUBJECT 100 DISTRICT : 00 (CUNTT - LEON COOS SUMMAR' OF STOALIZATION TEA DE SCHNTON UN CONDUIT, FURNISH & INSTALL MCK & BORE UNDER RAIROND LF CANST MR.F.4. WIND SPEED-TSO:SIGLE ANDWITH F	CO VIT 000000000000000000000000000000000000	UNTY/SECTION : QUANTITY TOTAL 11.000 2.000						
0649-31-20,         MAXT MILLER AT 100 SPEED-205.516LE AMUNT ALTIN.         EA         1.000         1.000           0650-1-12         TARDET CONSTANCE AND ALTIN.         EA         1.000         1.000           0650-1-12         TARDET CONSTANCE AND ALTIN.         SECTION.         AS         1.000           0650-1-13         TARDET CONSTANCE AND ALTIN.         SECTION.         AS         1.000           0650-1-13         TARDET CONSTANCE AND ALTIN.         SECTION.         AS         1.000           0650-1-13         TARDET CONSTANCE AND ALTIN.         AS         1.2000         1.3000           0660-1-10         TARDET CONSTANCE AND ALTIN.         AS         1.2000         1.3000	EAD PROJ ROJECT(S	0.JECT : 000000- 5) : 000000000 17EM NUMBER 0630- 2-13 0649- 31-107	CON PRODUCS &: TRABE     CON CONT : TRABE     CONT     CON CONT : TRABE     CONT	CO UIT 000000000000000 111.000 0 2.000 0 1.000	UNTY/SECTION : QUANTITY TOTAL 11.000 2.000 1.000						
Defense 31-240         Annu Eschi Yi OS         PA         LLOOD         LLOOD           0650-1-13         [PARFFC SSRA, FUNDISH & INSTAL ALUMINUM, 2 SECTION, AS         1000         1000           0650-1-13         [PARFFC SSRA, FUNDISH & INSTAL ALUMINUM, 3 SECTION, AS         12000         13000           0650-1-10         [PARFFC SSRA, FUNDISH & INSTAL ALUMINUM, 3 SECTION, AS         12000         13000           0650-5-110         [PARFFC SSRA, FUNDISH & INSTAL ALUMINUM, 3 SECTION, AS         15000         1000	EAD PROJ ROJECT(S	DJECT : 000000- 5) : 0000000000 ITEM NUMBER 0630- 2-13 0649-31-107 0649-31-202 0649-31-203	Fight PROFOSA: 18888         Immodel           000-00         DISTRICT: 00 0           000         CONTY: 1.600           000         SUMMAR OF SUMMAR 2014           000         CONTY: 1.600           000         SUMMAR OF SUMMAR 2014           000         CONDUT; 1.000           000         SUMMAR OF SUMMAR 2014           001         JUNISH 6. INSTALL JEK K. BORE DOOR BARLINGO           001         SUMMAR 2015           001         SUMMAR 2014	CO IIT 000000000000 11.000 0 2.000 0 1.000 0 1.000	00ANTITY TOTAL 11000 2000 1.000						
0600-1-1:         [PAPT]C SIGNA, FIRMISH & INSTAL ALEMINAN, 3-2 SECTION, AS         1.000           0600-1-1:         [PAPT]C SIGNA, HUMISH & INSTAL ALEMINAN, 3-2 SECTION, AS         1.000           0600-1-1:         [PAPT]C SIGNA, HUMISH & ISSERIEL, FALAMINEN, 3-2 SECTION, AS         12.000           0600-1-1:         [PAPT]C SIGNA, SIGNA, HUMINEN, 3-2 SECTION, AS         12.000           0600-1-1:         [PAPT]C SIGNA, SIGNA, HUMISH & ISSERIEL, FALAMINEN, AS         12.000	EAD PRO. PROJECT(S	DJECT : 0000000 5) : 0000000000 ITEM NUMBER 0630- 2- 13 0649- 31-107 0649- 31-202 0649- 31-202	Рад народов. 19888 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1	CO WIT 000000000000 11.000 A 2.000 A 1.000 A 1.000 A 1.000	00/01//SECTION : 00/01/11/Y TOTAL 11.000 2.000 1.000 1.000						
0650-1-15 	EAD PRO. IROJECT(S	DJECT : 000000- 5) : 0000000000 ITEM NUMBER 0630- 2- 13 0649- 31-107 0649- 31-202 0649- 31-203 0649- 31-204	Dest         PROF Sec. 15888         PROF Sec. 15888           0000         DISTRICT: 00         DISTRICT: 00           0000         CONUTY: LEON         OCOS           0000         SUMMAN OF SCHALTZATION         DISTRICT: 00           00001         SUMAN OF SCHALTZATION	CO III 0000000000000 III.000 A 2.000 A 1.000 A 1.000 A 1.000 A 1.000	00000000000000000000000000000000000000						
0600-5-110/41MMPTC CONTROLLER ASSEMBLT, FAL, NEMA AS 568.000 1.000	EAD PRO ROJECT(S	DJECT : 000000- S) : 00000000000 ITEM NUMBER 0630- 2- 13 0649- 31-202 0649- 31-203 0649- 31-204 0649- 31-204 0650- 1- 13		CO HIT 000000000000 11.000 0 2.000 0 1.000 0 1.000 0 1.000 5 1.000	0000TY/SECTION : 00000TTY TOTAL 11.000 2.000 1.000 1.000 1.000 1.000						
losse activitizative controleten nastenisti, ren, nenn på snovog 1.000	EAD PRO. ROJECT(S	DJECT : 000000- S) : 0000000000 ITEM NUMBER 0630- 2-13 0649- 31-202 0649- 31-203 0649- 31-203 0649- 31-204 0650- 1-13 0650- 1-15	PORT PROTOSA: TERMI         PROT           000-00         DISTRICT: 00           000         CONTY: LEON           0000         SUMMAR DE STADALIZITON           0001         SUMMAR DE STADALIZITON           0002         SUMMAR DE STADALIZITON           0003         SUMMAR DE STADALIZITON           0004         SUMMAR DE STADALIZITON           0005         SUMMAR DE STADALIZITON           0007         PONSTA E INSTALL NEX & EDRE UNDERSTADE           0008         STRED-LOS SINGLE AMMERTIN           0008         STRED-LOS SINGLE AMMERTING           0008         STRED-LO	CO HIT 0000000000000 11.000 A 2.000 A 1.000 A 1.000 A 1.000 S 1.000 S 1.000 S 1.000	00000000000000000000000000000000000000						
	EAD PRO. IROJECT(S	DJECT : 000000- 5) : 000000000 0630- 2- 13 0649- 31-107 0649- 31-202 0649- 31-204 0649- 31-204 0650- 1- 13 0650- 1- 15 0650- 1- 15		CO VIT 000000000000 11.000 0 2.000 0 1.000 0 1.000 0 1.000 5 1.000 5 1.000 5 1.000	UNTY/SECTION : OUANTITY TOTA. 11.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000						
	EAD PRO. IROJECT(S	JJECT : 000000 S) : 000000000 ITEM NUMBER 0630 - 2- 13 0649- 31-202 0649- 31-202 0649- 31-203 0649- 31-204 0650- 1- 13 0650- 1- 15 0670- 5-110	Construction         Construction           0x00-00         DISTINCT: 100           0x00         Constru: 1.600           0x00         Constru: 1.600           0x00         Constru: 1.600           0x00         Statutation           0x005         Statutation           0x005         Statutation           0x005         Statutation           0x005         Statutation           0x005         Statutation           0x01         Statutation </td <td>CO           III.000           IIII.000           III</td> <td>UNITY/SECTION : GUANTITY TOTAL 11000 2000 1000 1000 1000 1000 13000 13000 1000</td> <td></td> <td></td> <td></td> <td></td> <td></td>	CO           III.000           IIII.000           III	UNITY/SECTION : GUANTITY TOTAL 11000 2000 1000 1000 1000 1000 13000 13000 1000						
	EAD PRO	JJECT : 000000 5) : 000000000 ITEM NUMBER 0630 - 2- 13 0649- 31-202 0649- 31-202 0649- 31-203 0649- 31-204 0650- 1- 13 0650- 1- 15 0670- 5-110	Frain Particisa, Frank         Frain           00-00-00         DISTRICT, 00         DISTRICT, 00           000         COUNT, LEON         COUNT, LEON           000         COUNT, LEON         DISTRICT, 100           001         COUNT, LEON         DISTRICT, 100           0010         COUNT, LEON         DISTRICT, 100           0011         FEIN DESCRIPT, 2000         DISTRICT, 2000           0010         STREED, 2000         DISTRICT, 2000           0010         STREED, 2000         DISTRICT, 2000           0010         STREED, 2000         DISTRICT, 2000           0011         STREED, 2000         DISTRICT, 2000	CO 11 00000000000000000000 11 0000 10 000 10 000	00001775ECT100 : 000001775ECT100 : 11.000 2.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000						
A EVISIONS EXCHAPTION S EXCHAPTION DESCRIPTION DESCRIPTION DESCRIPTION DESCRIPTION DESCRIPTION DESCRIPTION DESCRIPTION	EAD PRO	DECT : 000000- S) : 0000000000 ITTEM NUMBER 0630 - 2-13 0649 - 31-302 0649 - 31-302 0649 - 31-202 0649 - 31-204 0649 - 31-204 0650 - 1-13 0650 - 1-15 0670 - 5-110	PORT PROJEKSA: FRABBIL         PROJ           00-00-0         DISTINCT: LOD           000         ECUNIT: LEON           000         ECUNIT: LEON           000         ECUNIT: LEON           000         ECUNIT: LEON           000         SECONT: LEON           000         ECUNIT: LEON           000         SECONT: LEON           000         SECONT: LEON           0000         SECONT           0000         SECONT           0000         SECONT           0000         SECONT           0000         SECONT           00000         SECONT           00000         SECONT           00000         SECONT           00000         SECONT           00000 <td>CO 117 000000000000 11.000 1 1000 1 1000 1 1000 1 1000 1 1000 5 12.000 5 12.000 5 5 12.000 5 5 12.000 5 5 12.000 5 5 12.000 5 5 5 12.000 5 5 5 12.000 5 5 5 5 12.000 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5</td> <td>UNIT/SECTION : UNIT/SECTION : 111000 2000 1000 1000 1000 1000 1000 1000 1000 0000 PALL NAME /F.</td> <td></td> <td>STATE OF FLORI</td> <td>DA</td> <td></td> <td></td>	CO 117 000000000000 11.000 1 1000 1 1000 1 1000 1 1000 1 1000 5 12.000 5 12.000 5 5 12.000 5 5 12.000 5 5 12.000 5 5 12.000 5 5 5 12.000 5 5 5 12.000 5 5 5 5 12.000 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	UNIT/SECTION : UNIT/SECTION : 111000 2000 1000 1000 1000 1000 1000 1000 1000 0000 PALL NAME /F.		STATE OF FLORI	DA			
REVISIONS BROWDER OF RECORD TRUE NEE PER	EAD PROJECT(S	LIECT : 00000-000 S) : 0000000000 ITEM NUMBER 0630 - 2 : 13 0649 - 31-20 0649 - 3	PORT PROJEKTA: FEBRE         PROJEKTA: FEBRE           000-00         DISTINICT: DO           000         CONTY: LEON           0000         STANDARD           0001         STANDARD           0002         STANDARD           0003         STANDARD           0003         STANDARD           0004         STANDARD           0005         STANDARD           0006         STANDARD           0007         STANDARD           0008         STANDARD           0009         STANDARD           0000         STANDARD           0000         STANDARD           0000         STANDARD           0000         STANDARD           0000         STANDARD           00000         STANDARD           00000         STANDARD           00000         STANDARD           00000         STANDARD           000000         STANDARD           0000000000         STANDARD           000000000000000000000000000000000000	CO     VIT 000000000000     VIT 000000000000     VIT 0000     A     1000     A     1000     A     1000     S     1200     S     S     S6800      ENGINEER OF RE     PE     CLEARS     W     PE     CLEARS     VI	UDITYSSCIDD UDITYSSCIDD UDITYSSCIDD UDITITION 1000 1000 1000 1000 1000 1000 1000 1000 000 1000 000 1000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 0000 0000 0000 000	DEPARTI ROAD NO.	STATE OF FLORI MENT OF TRANS	DA NORTATION NORTATION	1.5	CALE	
A E V I SI O N S OESCRIPTION DET COLORS NUMBER OF RECORD FALL NAME P.F. DESCRIPTION DET COLORS NUMBER OF RECORD FALL NAME P.F. DE LICENS NUMBER OF RECORD FALL NAME P.F. DE LICENS NUMBER OF RECORD COLORNY STREET RAD 000 COLORY TIMACIA ROBET ID RAD 000 COLORY TIMACIA ROBET ID TIMACIA ROBET ID	EAD PRO. ROJECT(S	DECT : 000000- S) : 0000000000 TFEA MUNERA 0649- 31-107 0649- 31-202 0649- 31-202 0649- 31-202 0649- 31-202 0649- 31-202 0649- 31-204 0650- 1-13 0650- 1-15 0670- S-110	Pair MODOSA: 19888         Prind           000-00         DISTRICT: 00         D           001         COUNT: 14500         COUNT: 14500           002         SEMINET: 2000         DISTRICT: 00           003         SEMINET: 2000         DISTRICT: 00           004         COUNT: 14500         DISTRICT: 00           005         SEMINET: 2000         DISTRICT: 00           005         SEMINET: 2000         DISTRICT: 2000           006         SEMINET: 2000         DISTRICT: 2000           007         DISTRICT: 2000         DISTRICT: 2000           008         SEMINET: 2000         DISTRICT: 2000           008         SEMINET: 2000         DISTRICT: 2000           009         SEMINET: 2000         DISTRICT: 2000           0000         DISTRICT: 2000         DISTRICT: 2000           0000         DISTRICT: 2000         DISTRICT: 2000           012         DISTRICT: 2000         DISTRICT: 2000           12 <td>CO     CO     CO</td> <td>UNITY-SECTION UNITY-SECTION UDANTITY TOTA 11000 11000 11000 13000 13000 13000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 100</td> <td>DEPARTA ROAD NO.</td> <td>STATE OF FLORII MENT OF TRANSF</td> <td>DA ORTATION</td> <td>1 50</td> <td>CALE</td>	CO	UNITY-SECTION UNITY-SECTION UDANTITY TOTA 11000 11000 11000 13000 13000 13000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 100	DEPARTA ROAD NO.	STATE OF FLORII MENT OF TRANSF	DA ORTATION	1 50	CALE	

If you go to the Model tab and zoom extents you will see the reports were created and placed there. If you had to re run the report the application would delete the existing tables before re-creating them in the same spot.

18. Save the file and Close Civil 3D.

This concludes the Automated Quantities Manual