

FDOT Entity Manager for Civil 3D



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What is Entity Manager (EMX) Used for ?

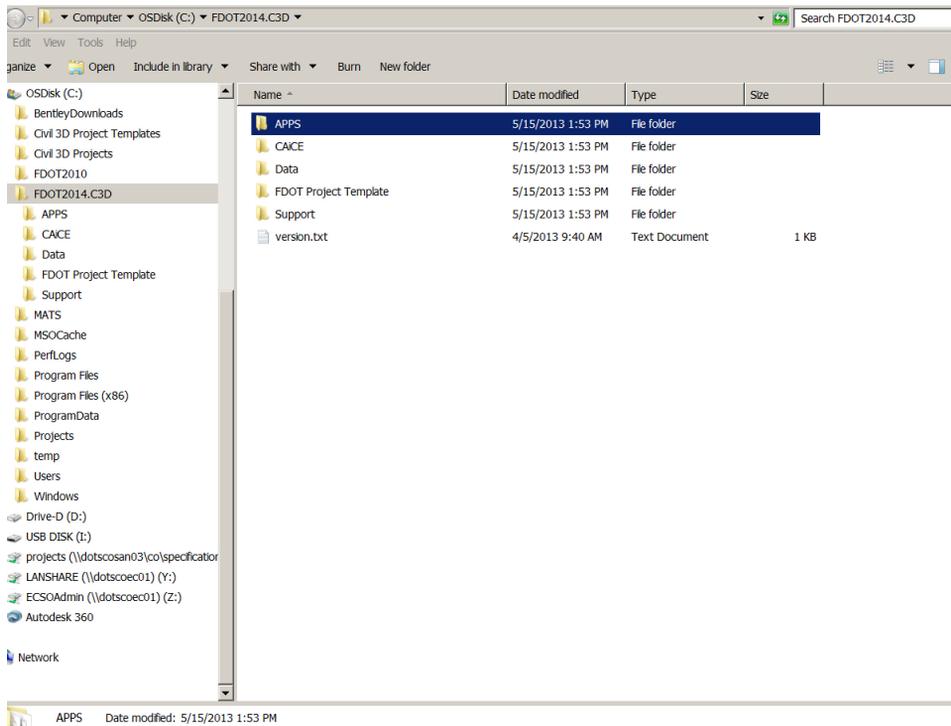
- ◆ Entity Manager allows the user to draw graphical entities with pay item data for QTO pre-attached, or place the pay item data on entities after they are drawn.
- ◆ Entity Manager helps enforce drafting standards with tools for drawing primitive entities on the proper ByLAYER for the drawing that is open.
- ◆ Entity Manager is evoked for the FDOT Ribbon, or can be run by typing the Command “EMX” at the command line
- ◆ Entity Manager stays resident during the Civil 3D Session so it can be opened and closed quickly.



Configuration

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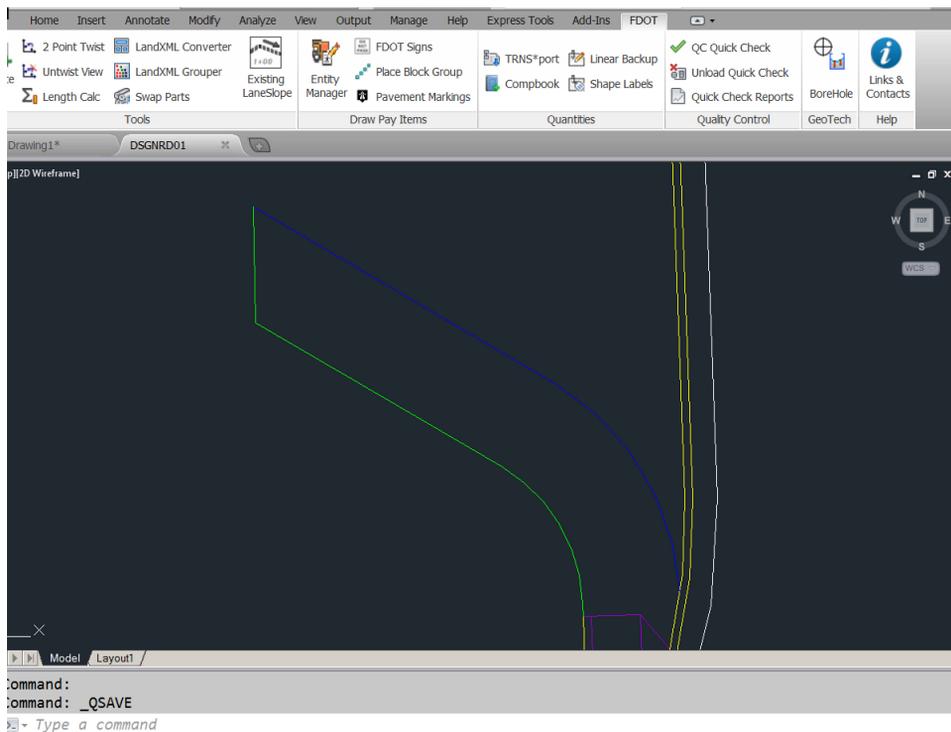
- ◆ FDOT Pay Item database
(**EntityManagerPayitemDatabase.txt**)
The shipped default database of pay items, attributes, adhoc's, and symbology. This is used to restore defaults.
- ◆ FDOT Rule Standards database for Filename / Layer / Symbology (**MasterStandards.xlsx**)
- ◆ FDOT Pay Item Criteria Includes formula data, etc.
(**AECMERGE.xml**)
- ◆ TRNS*PRT Categories provides the numeric groupings
(**FloridaCategories.xml**)
- ◆ **FDOTEntityManager.Log** is in the user's TEMP folder
C:\Users\rd964mp.CO\AppData\Local\Temp\FDOTEntityManager.Log



After First Execution

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- ◆ First execution, EMX reads the default **EntityManagerPayitemDatabase.txt**
- ◆ After the first execution, Entity Manager uses the custom database you saved for your project
 - ✓ **PayitemDB.xml** allows custom changes to the pay items
 - ✓ Use the “File > Save As...” icon to the database at any time to a project, or share it with someone else.



The File Menu

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- ◆ Open Folder Icon
 - ✓ Open – Reads the custom pay item database (automatic on next EMX startup)
 - ✓ Save – Saves the database as changes are made (does not save by default !)
 - ✓ Save As – Saves custom pay item database to new location
 - ✓ Export - Saves a Pay Item database compatible with QTO (**AECMERGE.xml**)
 - ✓ Default – Opens and loads the original pay item database text file delivered with application (**EntityManagerPayitemDatabase.txt**).
- ◆ The **PayItemDB.xml** is the “customized” pay item database for your project. Any changes the user makes to the pay item data are saved to this database. Favorites are also saved to this file. You can copy or Save As... for another user or project. Once you open EMX, you can select to open another customized database from the menu bar Open menu item. EMX remembers your selection (or last Save As) to open in the next session.



The screenshot displays the AutoCAD software interface. The top ribbon includes tabs for Home, Insert, Annotate, Modify, Analyze, View, Output, Manage, Help, Express Tools, Add-Ins, and FDOT. The FDOT tab is active, showing various tool icons such as QC Quick Check, Unload Quick Check, Quick Check Reports, BoreHole, Links & Contacts, and Help. Below the ribbon, the drawing area shows a 2D wireframe of a road layout. On the left side, the Entity Manager tool palette is open, displaying a list of item categories and a table of pay items.

Entity Manager

View: id 3d 2d 9% Tools

Item Categories: Entity XData | Select Pay Items

- Topography
- Structures
- RW Items for Roadway Plans
- Roadway Design
- Drainage
- Erosion Control
- Utilities
- Signalization
- Signaling
- Pavement Markings
- ITS
- Highway Lighting

Sort by: Text filter | Pay item to find

Item	Description	Layer
Topography		
P	Asphalt Pavement (Edge)	PavT
ARW	Barrier Wall	Barri
.DG	Buildings	Build
GB	Curb and Gutter (Back)	CGBa
GF	Curb and Gutter (Face)	CGFa
WYE	Driveway (Drive, Lane, Turnout)	Drive
VC	Existing Fence	Fence
P	Pavement Misc. (Misc. Parking, guardrail p...	PavT
-LDR	Shoulder Edge, Paved	Shldr
NK	Sidewalk (Fronts)	Sidev

Command: Type a command

The View Menu

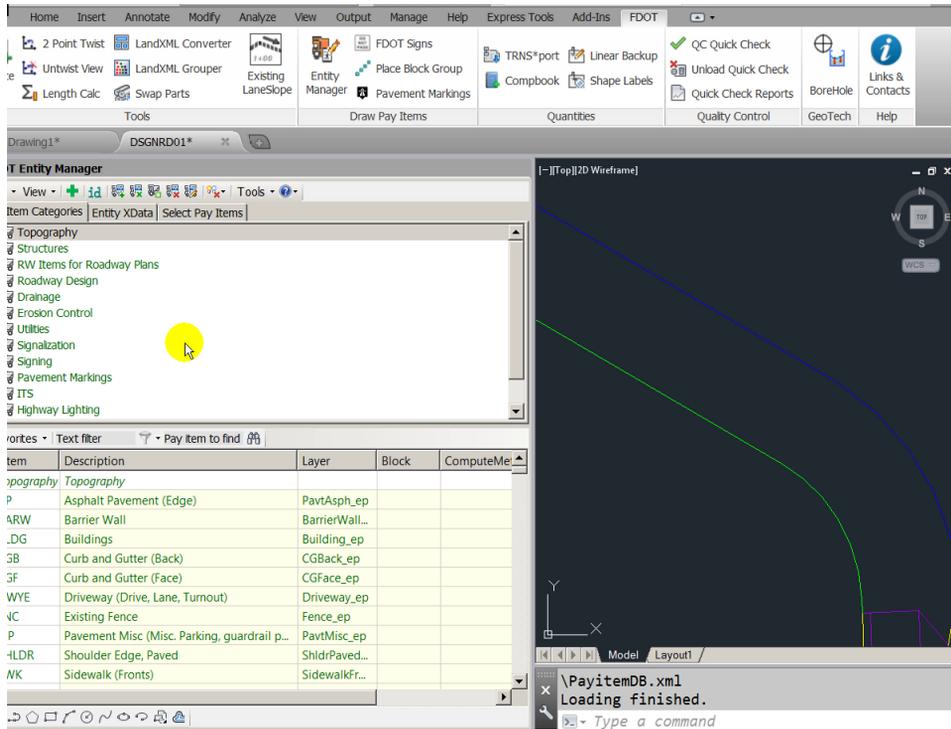
- ◆ Show / Hide Categories Icon
 - ✓ Show or hides the pay item category tree view
- ◆ Favorites
 - ✓ Add to Favorites
 - ✓ Remove from Favorites
 - ✓ Organize Favorites – open dialog to aide in editing, importing and exporting favorites
 - ✓ Favorites list – is saved in the registry and with the custom pay item database.



The screenshot displays the AutoCAD software interface. The top ribbon shows the 'View' tab, with the 'Show/Hide Categories' icon highlighted. The 'Entity Manager' panel is open on the left, showing a list of item categories and their descriptions. The main drawing area shows a wireframe model of a road layout. A status bar message at the bottom indicates that the pay items database has been saved to a specific location and loading is finished.

Item	Description	Category
<i>Topography</i> Topography		
P	Asphalt Pavement (Edge)	P
ARW	Barrier Wall	E
.DG	Buildings	E
GB	Curb and Gutter (Back)	C
GF	Curb and Gutter (Face)	C
WYE	Driveway (Drive, Lane, Turnout)	E
VC	Existing Fence	F
P	Pavement Misc (Misc. Parking, guardrail p...	P
HDR	Shoulder Edge, Paved	S
NK	Sidewalk (Fronts)	S

Pay items database saved to D:\e\Projects\PayitemDB.xml
Loading finished.



Finding Pay Items in the Database

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- ◆ Search Text Field
 - ✓ Type the pay item id to locate – jumps directly to category and listing
 - ✓ Type in first characters (numbers) – to display dropdown list of available pay items
- ◆ Filter Text Field
 - ✓ Type text to filter pay item or descriptions (a general text search)
 - ✓ Finds the first occurrence, and lists all matching items
- ◆ Search Next (Binocular Icon)



Search for the next occurrence of the pay item id

IT Entity Manager

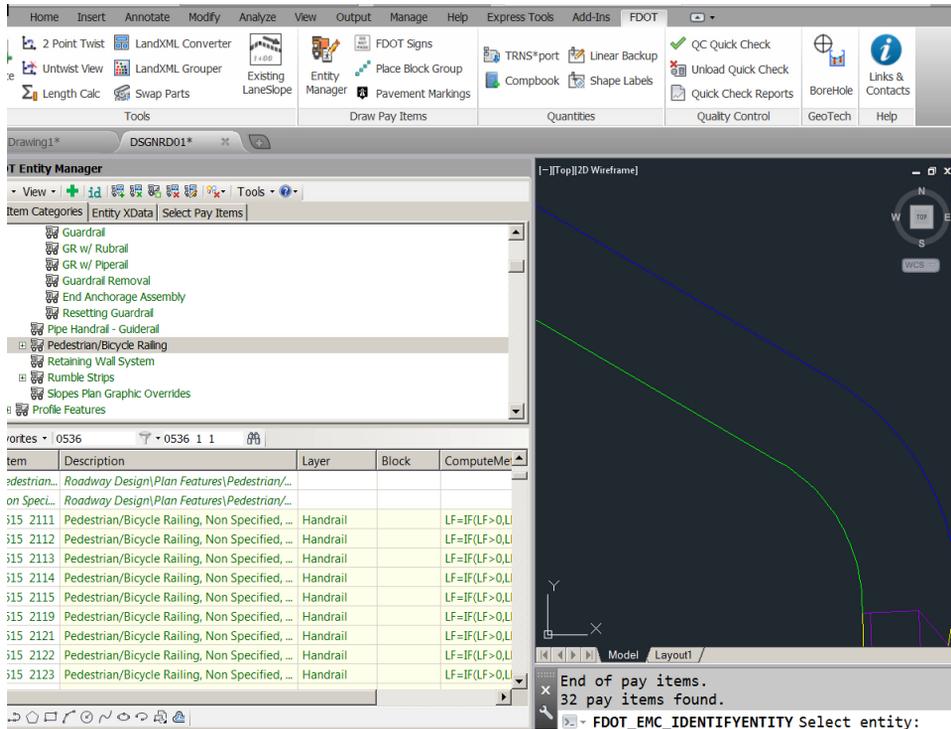
Item Categories: Entity XData | Select Pay Items

Item	Description	Layer	Block	ComputeMet
NK	Sidewalk (Fronts)	SidewalkFr...		
NKB	Sidewalk (Backs)	SidewalkBa...		
SW	Back of Sidewalk	SidewalkBa...		
iW	Front of Sidewalk	SidewalkFr...		
i26 1 2	Pavers, Architectural, Sidewalk	Pavers		SY=IF(SY>0.5
i22 1	Sidewalk Concrete, 4" Thick	SidewalkCo...		SY=IF(SY>0.5
i22 2	Sidewalk Concrete, 6" Thick	SidewalkCo...		SY=IF(SY>0.5
SSWB	Sidewalk Base	SidewalkBa...		
N	Sidewalk (Proposed)	Sidewalk_px		
NE	Sidewalk (Existing)	Sidewalk_ex		
715 14 12	Lighting - Pull Box, F&I, Sidewalk	PullBox	PullboxL	EA=IF(EA>0.
715 14 42	Lighting - Pull Box, Relocate, Sidewalk	PullBox	PullboxL	EA=IF(EA>0.
715 14 52	Lighting - Pull Box, Remove, Sidewalk	PullBox	PullboxL	EA=IF(EA>0.

Select object(s) for assignment: 1 found
Select object(s) for assignment:

Working with favorites

- ◆ Manage favorites list
- ◆ Draw entities with favorite pay items



Editing Pay Item data (both DB & entities) §

- ◆ ID Icon
 - ✓ Displays the selected entity properties palette
 - ✓ Loads the properties with attached XData information
- ◆ Entity Attributes
 - ✓ Allows the edit of the pay item data attached to the entity
 - ✓ Note this differs from editing the pay item database !
- ◆ Use Highlight and Show to identify entities with or without pay items

The screenshot displays the AutoCAD interface with the Entity Manager palette open. The palette shows a list of pay items for fences, including their descriptions, layers, and compute methods. The drawing area shows a wireframe view of a road layout with various fence lines.

Item	Description	Layer	Block	ComputeMethod
i50 10110	Fencing, Type A, 0.0- 5.0' Height, Standard	Fence		LF=IF(LF>0,LI
i50 10120	Fencing, Type A, 5.1- 6.0' Height, Standard	Fence		LF=IF(LF>0,LI
i50 10130	Fencing, Type A, 6.1- 7.0' Height, Standard	Fence		LF=IF(LF>0,LI
i50 10140	Fencing, Type A, 7.1- 8.0' Height, Standard	Fence		LF=IF(LF>0,LI
i50 10150	Fencing, Type A, 8.1- 10.0' Height, Standard	Fence		LF=IF(LF>0,LI
i50 10210	Fencing, Type B, 0.0- 5.0' Height, Standard	Fence		LF=IF(LF>0,LI
i50 10220	Fencing, Type B, 5.1- 6.0' Height, Standard	Fence		LF=IF(LF>0,LI
i50 10230	Fencing, Type B, 6.1- 7.0' Height, Standard	Fence		LF=IF(LF>0,LI
i50 10240	Fencing, Type B, 7.1- 8.0' Height, Standard	Fence		LF=IF(LF>0,LI

Command: Select entity:
Type a command

Applying and Manipulating Pay Items

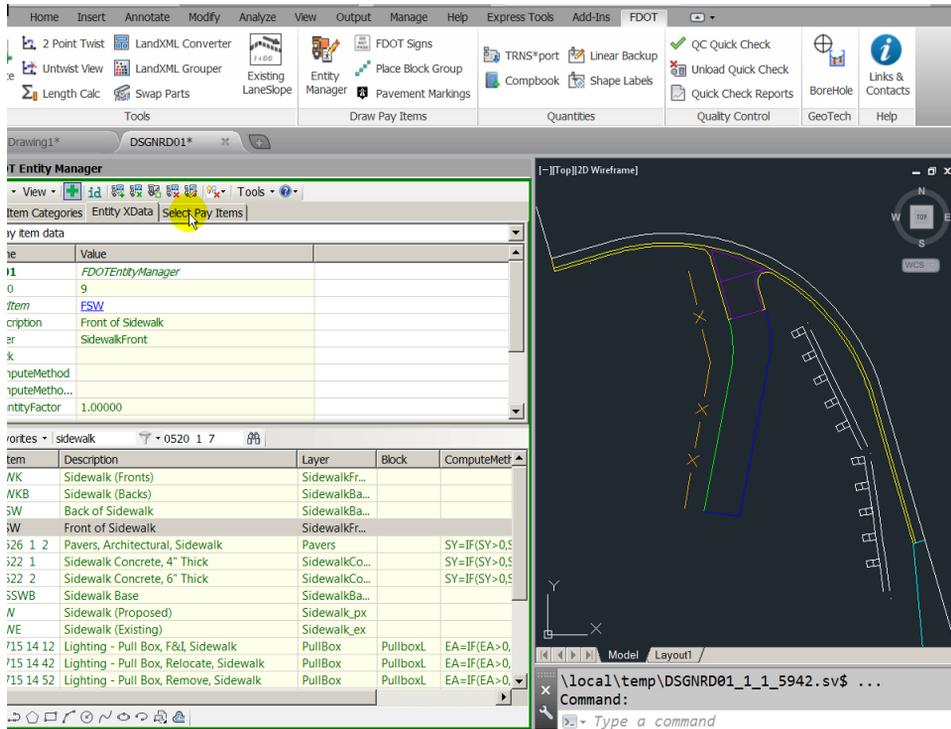
- ◆ Append Pay Item Truck Plus (+) Icon
 - ✓ Appends selected pay items data to selected entities.
- ◆ Replace Pay Item Truck X (Green) Icon
 - ✓ Appends selected pay items data to selected entities by replacing original data.
- ◆ Remove Pay Item Truck X (Red) Icon
 - ✓ Removes all EM pay item data from selected entities.
- ◆ Add Pay Item (+) Icon
 - ✓ Adds the current pay item to the Selected Pay Items list on the Pay Item Properties palette

The screenshot shows the AutoCAD interface with the Entity Manager tool active. The Entity Manager table is displayed, listing various entities and their associated pay items. The table has columns for Item, Description, Layer, Block, and Compute Method. The drawing area shows a 2D wireframe of a road layout with various colored lines and shapes representing different road features.

Item	Description	Layer	Block	Compute Method
i20 1 8	Concrete Curb & Gutter, Special (Pensacol...	CurbFace		LF=IF(LF>0,LI
i20 1 10	Concrete Curb & Gutter, Type F	CurbFace		LF=IF(LF>0,LI
i20 2 1	Concrete Curb, Type A	CurbFace		LF=IF(LF>0,LI
i20 2 2	Concrete Curb, Type B	CurbFace		LF=IF(LF>0,LI
i20 2 4	Concrete Curb, Type D	CurbFace		LF=IF(LF>0,LI
i20 2 8	Concrete Curb, Type RA	CurbFace		LF=IF(LF>0,LI
i20 2 9	Concrete Curb, Special	CurbFace		LF=IF(LF>0,LI
i20 3	Valley Gutter - Concrete	CurbFace		LF=IF(LF>0,LI
i20 6	Shoulder Gutter - Concrete	CurbFace		LF=IF(LF>0,LI
i25 1	Curb Asphaltic Conc	CurbFace		LF=IF(LF>0,LI
CG	Back of Curb	CurbBack		

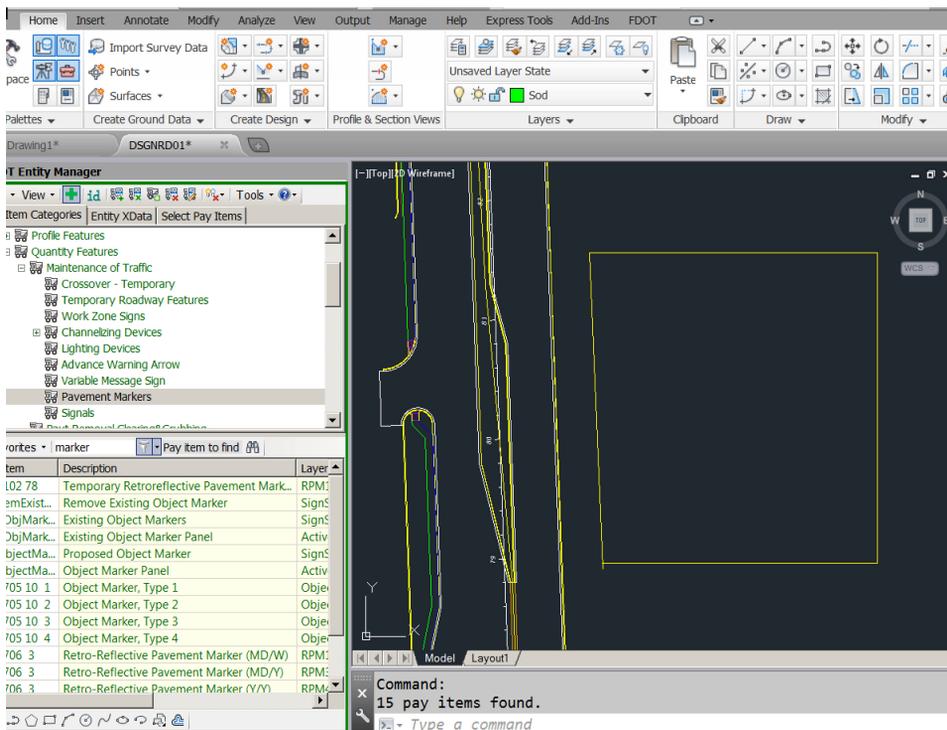
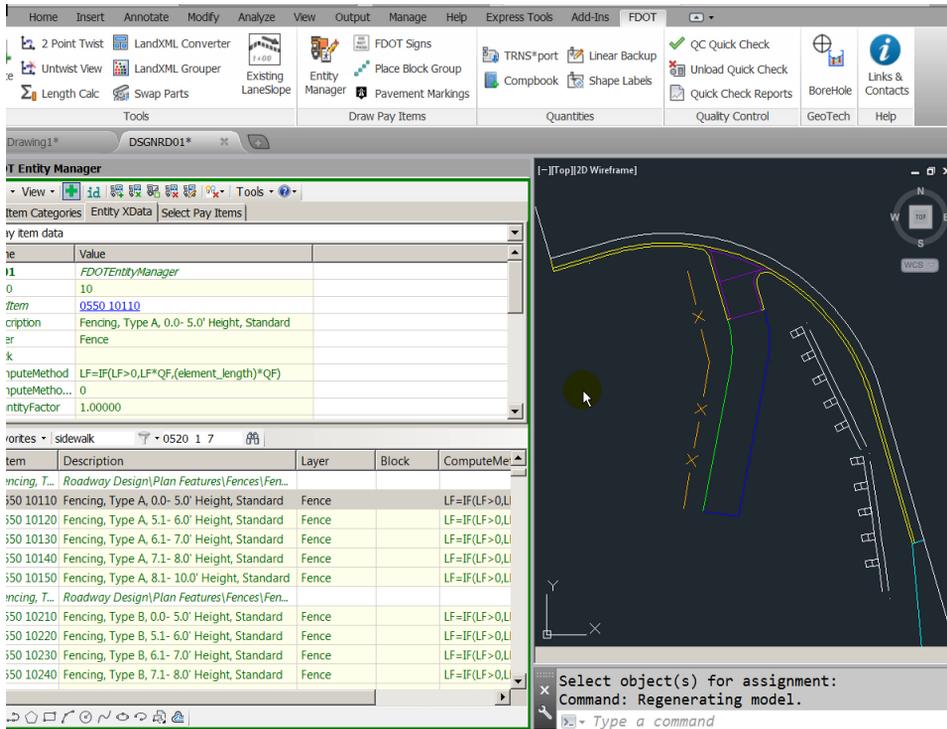
Displaying What Entities Have Pay Items §

- ◆ Highlight / Show Pay Item data
 - ✓ Highlight / Show only objects with pay items
 - ✓ Highlight / Show only objects without pay items
 - ✓ Highlight / Show only objects with selected pay items
 - ✓ Clear highlight selection
 - ✓ Toggle to optionally highlight or show/hide objects



Geometry types with Pay Items

- ◆ Entities can represent “Point” objects, Linear Objects (as we have seen), and Area based objects
 - ✓ Blocks can be placed as single insertions or by evoking the Place Block Group Tool
 - ✓ Linear Objects controlling geometry for Pavement Striping can be place that striping using the Pavement Markings Tool
 - ✓ Areas can have Pay items too



Tools Tab

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◆ Tools & Options

- ✓ Show Layer Warning – If checked the user will be prompted when the current layer is not found in the FDOT Level rules database for the current drawing file name.
- ✓ Show Drawing Tools – If checked the tools menu will display for drawing object and attaching pay item data.
- ✓ Show Entity Tool Tip – If checked, display tool tip pay item data when the cursor passes over objects with pay item data.



The screenshot displays the AutoCAD software interface. The top ribbon includes tabs for Home, Insert, Annotate, Modify, Analyze, View, Output, Manage, Help, Express Tools, Add-Ins, and FDOT. The main workspace shows a drawing of a road layout with various layers and pay items. A large green rectangular area is highlighted on the right side of the drawing.

The **IT Entity Manager** tool tip is visible on the left side of the drawing. It shows the following information:

- Item Categories: Entity XData | Select Pay Items
- Item data table:

Item	Value
Item	FDOTEntity/Manager
Code	10
Item	0570 1 1
Description	Performance Turf
Layer	Sod
ComputeMethod	SY=IF(SY>0,SY*QF,(element_area/9)*QF)
ComputeMetho...	0
EntityFactor	1.00000

Below the table, the **Properties** section shows:

- performance
- Pay item to find

The bottom status bar shows the command: ***Cancel*** and ***Cancel***.

Application Options

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- ◆ Options
 - ✓ Which Categories to Display?
 - ✓ User Settings
 - Layer Confirmation default
 - Drawing Toolbar Default
 - Tool Tip defaults
 - Vertical versus Horizontal View layout
 - Hide categories in tree View
 - ✓ Program application configuration variables
 - ✓ Definition for Units and Formulas



The screenshot shows the AutoCAD software interface. The top ribbon includes tabs for Home, Insert, Annotate, Modify, Analyze, View, Output, Manage, Help, Express Tools, Add-Ins, and FDOT. The main workspace is in wireframe view. On the left, the 'Item Categories' tree is visible, with a yellow circle highlighting the 'Select Pay Items' button. Below the tree is a table of item categories.

Item	Description	Layer
ARW	Barrier Wall	Barri
LDG	Buildings	Build
GB	Curb and Gutter (Back)	CGBa
GF	Curb and Gutter (Face)	CGFa
WYE	Driveway (Drive, Lane, Turnout)	Drive
NC	Existing Fence	Fence
IP	Pavement Misc (Misc. Parking, guardrail p...	Pavth
HLDR	Shoulder Edge, Paved	Shldr
WK	Sidewalk (Fronts)	Sidev
WKB	Sidewalk (Backs)	Sidev
FSP	Traffic Separator	TrafS
VETEDGE	Wetland Edge	Weti
tructures	Structures	
LCONST	C/L of Const. w/stationing	CLCo
BAS	Existing Bridge Approach and Slabs	Bridg

At the bottom of the screen, the command line displays the message: "Command: Options changes cancelled." Below this, a prompt says "Type a command".