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Workshop - X13 Harvesting Quantities with InRoads V8i: Setting Up Quantity Manager

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Lesson Name: Pay Item Manager

LESSON OBJECTIVE:

In this lesson you will learn how to access and edit the Pay Item database.

EXERCISE: GETTING STARTED

This exercise will guide you through the steps to get started

- 1. Start MicroStation and InRoads.
- 2. When the MicroStation Manager appears, navigate to C:\2010 RBC Data\Cl1WK1\DATA\QM\ Model.dgn

File Open - C:\2009F	RBC\IW-5\QM\	N					? ×
Look in: [🗅 QM		•) 🜶 📂 🛄-	1 🗃 🖸	3D - V8 DGN	
My Recent Documents Desktop My Documents My Computer	() model.dgn () pp1.dgn () pp2.dgn () pp3.dgn () pp4.dgn () profile.dgn						
Fil	ile name:	model.dgn		•	Open	User: untitled	•
Places Fil	iles of type:	CAD Files (*.dgn;*.dwg;*.dxf)		•	Cancel	Project: untitled	•
		C Open as read-only			Options	Interface: default	•
							11.

3. After MicroStation starts, activate InRoads by selecting **Applications > InRoads Group > Activate** InRoads



4. Open the file C:\2010 RBC Data\CI1WK1\DATA\QM\QM.RWK by selecting File > Open from the InRoads Explorer Menu.

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My Network Places	File name: QM.rwk Op Files of type: InRoads Files (*.rwk;*.dtm;*.alg;*.itl;*.ird;*.sdb;*.g▼ Car He He	en icel

Click the **Open** button, then the **Cancel** button to close the dialog.

5. Open the Pay Item Database by selecting **Quantities > Pay Item Manager** from the InRoads Explorer Menu.



 After the Pay Item Manager opens, select File > Open from the Pay Item Manager, click on Pay_Items.mdb, and click Open.



7. The following should be displayed:

🚰 Pay Item Manager				- U ×
File Edit Help				
C:2009FIBCVIV-5V0MXFay_Items mdb 210-219 CLEARING, GRUBBING AND REMOVAL 210-214 EXCAVATION AND BACKFILL 210-214 EXCAVATION AND BACKFILL 210-214 EXCAVATION AND BACKFILL 210-214 EXCAVATION AND BACKFILL 210-214 EXCAVATION, COFFERDAMS, LIM 230-245 SOIL STABILIZATION 250-265 HAZARDOUS MATERIAL REMOVAL AND M 301-315 BASE COURSE AND AGGREGATE MATERI 327 ASPHALT BASE 330 CONCRETE BASE 401-405 BITUMINOUS TREATMENT, SLURRY SEAL 408-410 PLANING AND PROFILOGRAPH 411-429 ASPHALT PAVING, LEVELING, BINDER AN 430 SOIL AND AGGREGATE SURFACING 450-490 CONRETE PAVING AND ASSOCIATED ITEN 502-523 STEEL AND BRIDGE ITEMS 502-523 STEEL AND BRIDGE TEMS 524-529 CULVERT CONCRETE, RETAINING WALL, 530-538 DRAINAGE PIPE 543589 TIMBER BRIDGE AND ADDITIONAL BRIDG 590-603 MOBILIZATION, R/W MARKERS AND FIELT	Name 201-209 CLEARING, GRUB 210-214 EXCAVATION AN 215-228 BRIDGE EXCAVA 230-246 SOIL STABILIZATI 250-265 HAZARDOUS MA 301-315 BASE COURSE A 327 ASPHALT BASE 330 CONCRETE BASE 401-405 BITUMINOUS TR 406-410 PLANING AND PR 410-420 CDNRETE PAVIN 502-523 STEEL AND BRID 524-523 CULVERT CONCR 530-538 DRAINAGE PIPE 543-589 TIMBER BRIDGE 4	Code	Description	

Exercise: CREATING A PAY ITEM

This exercise will guide you through the steps to create a Pay Item in the category 618 CONCRETE SIDEWALK AND DRIVEWAY, including how to apply a formula.

1. Navigate to and select the 618 CONCRETE SIDEWALK AND DRIVEWAY category on the left side of the Pay Item Manager. The contents of the folder will be displayed on right as shown.

Pay Item Manager					
File Edit Help					
File Edit Heip 604-608 UNDERDRAINS AND VERTICAL WICKS 609-610 RIP-RAP AND FILTER BLANKET 613 CONCRETE SIDEWALK AND DRIVEWAY 619 CONCRETE SIDEWALK AND DRIVEWAY 619 CONCRETE SIDEWALK AND CONC., JUNCTION BOX 620-622 MINOR STRUCTUR CONC., JUNCTION BOX 623-629 CURB AND GUTTER, MEDIAN SAFTEY BAF 630-632 GUARDRAIL, END ANCHORS, GLARE SCR 640-649 UTILITIES 640-649 UTILITIES 660-664 PLANTING, BUSHES AND TREES 665-674 PESTICIDE AND HERBICIDE TREATMENTS 675-680 ENGINEERING CONTROLS AND FACILITES 701-708 STRIPING, MARKERS AND DELINEATORS 709-717 SIGNING 720-728 ATTENUATORS AND PORTABLE SAFETY I 730-739 TRAFFIC SIGNALS AND CONTROLS 	Name 5 618A000 6 618A001 6 618B001 5 618B002 6 618B003 6 618B004 6 618B005	Code 618A000 618A001 618B000 618B002 618B003 618B003 618B004 618B005	Description Concrete Sidewalk, 4" Thick Concrete Sidewalk, 6" Thick Concrete Driveway, 4" Thick Concrete Driveway, 6" Thick Concrete Driveway, 6" Thick Concrete Driveway, 6" Thick (Includes Wire Me: Concrete Driveway, 6" Thick (Includes Wire Me: Concrete Driveway, 10" Thick (Includes Wire Me		
	<u> • </u>				

2. Select File > New > Pay Item from the Pay Item Manager Menu.



Note: an alternative method is to right-click in the white space of the right pane and use the pop up menu.

 Verify the lock is selected to the right of the name and description fields before you enter any data. This will simplify the data entry process. Enter the following: Name: 618A002 Description: Concrete Sidewalk (Area * thck) Unit Name: Cu Yd

For Quantity Calculation toggle the combo box to Cubic Yard.

🚟 Edit Pay Item	X
Pay Item Name: < 6184002	> Apply
Pay Item Code: 618A002	
Description: Concrete Sidewalk (Ar	rea [*] thck)
Unit Name: Cu Yd	<u>Heih</u>
Quantity Calculation Formula: Cubic Yard Variables: Name Value thck 0.25	Deduct from Pay Item Pay Item Deduction State Value:
Measurement Mode: I Planarized I Slope	Apply Quantity Factor: 0.00 Apply Rounding Factor: 0.00 Round Up Round Down

Click **Apply** and **Close** the Edit Pay Item dialog when complete.

4. Select the new item, and make a copy of it in the same folder (copy and paste – use standard Windows techniques). Note the name increments and is appended with a (2). Edit the new Pay Item.

 Notice the lock toggle is unlocked. This allows you to have multiple definitions for the same Pay Item. Enter the following information: Pay Item Name: 618A002 width*thck

Pay item Name. 018A002 with thek

Description: Sidewalk, linear (width*thickness)

🕌 Edit Pay Item	x
Pay Item Name: < 618A002 width*thck	
Pay Item Code: 618A002	
Description: Sidewalk, linear (width	*thickness)
Unit Name: Cu Yd	
Quantity Calculation Formula: Cubic Yard Variables: Value Name Value thck 0.25 Value: 0.00	Deduct from Pay Item Pay Items: Pay Item Deduction State Value: 0.00
Measurement Mode: © Planarized © Slope	Apply Quantity Factor: 0.00 Apply Rounding Factor: 0.00 Round Up O Round Down

Click **Apply** and **Close** the dialog.

EXERCISE: CREATING ITEM DEDUCTIONS

This exercise will guide you through the method to apply item deductions to a pay item computation.

 Use the Find function to locate the Item Name 623C000. On the Pay Item Manager dialog, select Edit > Find.



Search for 623C000 in the Find What field, select **Name** under the Search category and click **Find Next**.

Find Pay Item		×
Find what: 623C000		Find Next
Match case	Search • Name	Close
	O Code	Help
	C Description	

Close the Find Pay Item dialog after the item has been located.

- 2. Right click Edit or double click to Edit this item.
- 3. Add Pay Items to be deducted from this item calculation.

		Pay Items	
ay Item Name: < 623C000			
ay Item Code: 623C000		CAUTC2004\W\$207\Data\ALD0T.mdb CO1209CLARING, GRUBBING AND REI	Add
nit Name: Linear Feet	Help	210-214 EXCAVATION AND BACKFICE	Close
Quantity Calculation Formula: Linear Feet	Deduct from Pay Item Pay Items:	250-255 HAZARDOUS MATERIAL REMOV 301-315 BASE COURSE AND AGGREGAT	Help
Variables:	Pay Item Deduction	Description: Sector Secto	
Name Value	Add Pay	401-405 BITUMINOUS TREATMENT, SLL 406-410 PLANING AND PROFILOGRAPH	
	Item for		
Value: 0.00	Value: 0.00		
Measurement			
Mode: 📀 Planarized	Apply Quantity Factor: 0.00		
C Slope	Apply Rounding Factor: 1.00		
	Round Up C Round Down		

- Navigate the Pay Item tree or use the Find function on the Pay Items dialog to locate the following pay items to add to the deduction list.
 621C015 Inlets, Type S1 Or S3 (1 Wing)
 621C016 Inlets, Type S2 Or S4 (1 Wing)
 621C017 Inlets, Type S1 Or S3 (2 Wing)
 621C018 Inlets, Type S2 Or S4 (2 Wing)
- 5. For each Pay Item click **Add** to add it to the deduction list.
- 6. Now define a deduction value for each of these curb inlets. Single (1 Wing) shall have a value of 14 and double (2 Wing) shall be 20.

This is the amount of curb and gutter that will be deducted for each inlet type encountered when computing quantities.

- Toggle on Apply Rounding Factor and key a value of 1.00. Toggle on Round Up. This will round the Curb and gutter computation to the nearest foot when using the Compute Quantities command.
- 8. Apply and Close the Edit Pay Item Dialog.
- 9. Exit the Pay Item Manager dialog.

Lesson Name: Quantity Formula Manager

LESSON OBJECTIVE:

In this lesson you will learn how to define the mathematical operations to compute quantities.

EXERCISE: CREATING A NEW FORMULA

This exercise will guide you through the steps to create a new formula in the Pay Item Database.

- 1. Create a New Formula by selecting **Quantities > Quantity Formula Manager** from the InRoads Explorer menu.
- Click New on the dialog. For Name key-in "CY Width*thck". For Description key-in "Linear (width*thickness)". Set the Measurement Basis to Linear, and create the formula as hown in the dialog below:

🛣 New Quantity	Formula	X
Name:	CY Width"thek	Apply
Description:	Linear (width"thickness)	Close
Measurement Basis:	Linear 🗨	Help
Formula:		
{LINEAR}*width*thcl	k 🔨	
1	~	
X D D D D	Result: 1.00	
{LINEAR}	Test Values:	
	Name Value	
	{LINEAR} 1.00 width 1.00	
	thck 1.00	
4 5 6 *		
1 2 3 +		
0	/alue: 0.00	

Click **Apply** when complete.

- 3. Create another New Formula by selecting **New** on the dialog.
- 4. For **Name** key-in "Ton(s)(thck)" binder". For **Description** key-in "binder layer computation". Set the **Measurement Basis** to Area.
- 5. Create the formula to compute the weight, in tons for binder/base asphalt material. For this exercise, use 107 lbs per S/Y per inch in thickness. Use a variable "thck" to allow for thickness definition within the pay item.

The Test Values list box located in the dialog provides a means to test the mathematical operation of the Formula. The Calculator is provided to key-in numbers and operators as well as precedence parenthesis.

🛣 New Quantity	Formula		Đ	K
Name:	Ton(s)(thck)''Bnde	r	Apply	1
Description:	binder layer compu	tation	Close	1
Measurement Basis:	Area	•	Help	1
Formula:				-
(({AREA}/9*107)*thcl	k)/2000	^		
		\mathbf{v}		
X D D D F	lesult: 0.06		[
{ABEA}	est Values:			
	Name	Value	[
	(AREA) bok	1.00		
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<u>4 5 6 ×</u>				
1 2 3 +				
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The "**" is the power function.

- 6. Apply and Close the Edit Quantity Formula dialog.
- 7. Close the Quantity Formula dialog.

Exercise: Assigning Formula and Variable Items to a Pay Item

This exercise will guide you through the steps to assign pay items to an item, the different methods include using the style manager, feature properties, and assigning Pay Items to graphics.

1. Edit the Pay Item for Sidewalk computed using a linear measurement, 618A002 width*thck.

🛣 Edit Pay Item	X
Pay Item Name: < 6184002 width*thck	Apply
Pay Item Code: 618A002	
Description: Sidewalk, linear (width	"thickness)
Unit Name: Cu Yd	
Quantity Calculation Formula: CY Width*thck Variables: CY Width*thck Name Value twidth 4.00 thck 0.25	Deduct from Pay Item Pay Items: Pay Item Deduction ttrck Value: 0.00
Measurement Mode: © Planarized © Slope	Apply Quantity Factor: 0.00 Apply Rounding Factor: 0.00 C Round Up C Round Down

- 2. Select the **Quantity Calculation** "CY width*thck". This calculation computes a volume of concrete for a linear sidewalk feature using width and thickness variables instead of an Area.
- 3. Assign the variable values as shown in the dialog above. Select the Variable to change and key in the value.
- 4. Create a copy of Pay Item named 327A020 and give it a unique name of 327A020 5" thick.
- 5. Edit this new pay item and assign the formula defined for base computation.
- 6. For the variable value, key-in 5" for the thickness in inches.

🛣 Edit Pay Item	
Pay Item Name: < 327A020 5" thick	
Pay Item Code: 327A020	
Description: Plant Mix Bituminous	Base, Mix 1 Help
Unit Name: Ton(s)	
Quantity Calculation Formula: Ton(s)(thck)"Binder Variables: Name Value thck 5.00 Value: 0.00	Deduct from Pay Item Pay Items: Pay Item Deduction Image: State of the
Measurement Mnde: © Planarized © Slope &	Apply Quantity Factor: 0.00 Apply Rounding Factor: 0.00 Round Up C Round Down

7. Apply and Close to complete.

Lesson Name: Assigning Pay Items

LESSON OBJECTIVE:

In this Lesson you will learn how to link a pay item to a surface feature in the DTM. There are two methods to correlate a Pay Item to a feature in the DTM:

One way is to assign a Pay Item to a feature style and place the feature using the style that has that pay item defined. The second method is to use the Surface > Feature > Feature Properties command to manually assign pay items to an individual or group of features.

Both methods can also be utilized. An example being a culvert can have the pipe pay item defined by feature style and manually attach the pipe end treatments to the same feature.

The Feature Properties will reflect the method used. It will also alert you as whether or not a database is opened or if a pay item is missing from the loaded database.

Warning If you use the automated feature style method of assigning pay items, you will need to have unique styles for each feature. This ensures that a feature that has a style of Curb won't automatically select a Curb and Gutter pay item if it is actually a mountable curb pay item. Also be aware that if a feature uses a style for pay item, it will always use that pay item and cannot be deleted from that feature unless the style is edited.

EXERCISE: FEATURE STYLE PAY ITEM DEFINITION

This exercise will guide you through the steps to assign pay items to feature styles.

1. Select **Tools > Style Manager** from the Inroads Explorer menu. Select a feature style from the list of feature contained in the loaded XIN file.

-Show Styles	with Properties	Surface Properties	;	Geometry T	abling	Close
Include 6	eometry Point	Display Cross S	Section	🗖 Lire Tal	bling	New
🔲 Include 6	eometry Line	🗖 Display Profile		🗖 Arc Tab	ling	Edit
🔲 Include G	ieometry Arc	🔲 Pay Item		🔲 S piral T	abling	Сору
🔲 Include G	eometry Spiral	- Survey Properties				Copy Settings.
Include S	Urven	Custom Operat	ions	🗖 Attribute	-s 1	Delete
	urvey				~	Doloto
	uivey					Rename
Preference File	x. C:\BE data\Civi	\C1TNC111\data\Q	4 xin			Rename Help
Preference File Name	e: C:\BE data\Civi	\C1TNC111\data\QM	4.xin Nur	neric Code	Pay Item	Rename Help
Preference File Name 12INCMP 12INRCP 15INCMP 15INCP	:: C:\BE data\Civi	\C1TNC111\data\Qł Alpha Code	4.xin 0 0 0 0	neric Code	Pay Item	Rename Help
Preference File Name 12INCMP 12INRCP 15INCMP 15INRCP 18PET	C:\BE data\Civi Description 18" Pipe End Tre	\C1TNC111\data\QM Alpha Code al	4.xin 0 0 0	neric Code	Pay Item 6194.002	Rename Help
Preference File Name 12INCMP 12INRCP 15INRCP 15INRCP 18INCMP 18INCMP 18INCMP 21INCMP 21INCP	C:\BE data\Civi Description 18" Pipe End Tre 18" Storm Drain	\C1TNC111\data\Q} Alpha Code at	4.xin 0 0 0 0 0 0 0 0	neric Code	Pay Item 619A002 530A001	Help

- 2. Select one of the features listed and click the **Edit** button (an alternative method is to double click the selection).
- 3. The **Edit Style** dialog will be displayed. Verify the correct feature is displayed in the description box.

🚟 Edit Style		
Name:	Description: 18" Pipe End Treatment	
	Apply	Close Help

4. Select the item **Surface Feature** from the tree view on the left of the **Edit Style** dialog box. The **Edit Style** dialog will reflect the Surface Feature display options.

🚟 Edit Style		
Name:	Pay Item Name: [619A002 3-D/Plan Display Line Segments Annotation Cross Section Display Projected Line Segments Projected Points Crossing Pcints Annotation Components Profile Display Projected Line Segments Profile Display Projected Foints Projected Foints Crossing Points Annotation	
	App	oly Close Help

5. Click the Pay Items icon her next to the Pay Item Name field. This will access a tree view listing of the pay items contained in the database. Select the pay item for 18" Roadway Pipe End treatment. An alternate method is to use the **Find** feature.

🚟 Pay Items			X
E 🗎 6191	PIPE END	TREATMENTS	Add
- 5 6	519A000 519A001	12" Roadway Pipe End Tre 15" Roadway Pipe End Tre	Find
- Š	519A002	18" Roadway Pipe End Tre	Close
	519A003 519A004	24" Roadway Pipe End Tre 30" Roadway Pipe End Tre	Help
- S (519A005 519A006	36'' Roadway Pipe End Tre 42'' Roadway Pipe End Tre	
- 3	519A007	48" Roadway Pipe End Tre	
	519A008 519A009	54" Roadway Pipe End Tre 60" Roadway Pipe End Tre	
- S (519A010	66'' Roadway Pipe End Tre 72'' Roadway Pipe End Tre	
S (519A012	78'' Roadway Pipe End Tre	
S	519A013 519A015	84'' Roadway Pipe End Tre 96'' Roadway Pipe End Tre	
<		>	11.

- 6. **Close** the **Pay Items** dialog. **Apply** and **Close** the Edit Style dialog. If prompted, indicate you wish to save the changes.
- Close the Style Manager dialog. Any feature that uses this feature style will now use this pay item (and subsequent formula) to compute quantities for that feature.

EXERCISE: DEFINING PAY ITEMS USING FEATURE PROPERTIES

This exercise will guide you through the steps to define pay items using Feature Properties.

- Assign the Bituminous Base pay item to the pavement feature in the Proposed with Drive DTM. The feature has style assigned with it that automatically assign the wearing surface item. Go to Surface > Feature > Feature Properties.
- 2. Select the **Proposed with Drive** surface from the surface combo box. Select the feature "Pavement" from the Feature list box.

🚟 Feature Pr	roperties				
Surface: Feature: Name Lttc8 Pavement Rt-Cut Rt-Cut Rt-Fill Rt-Fill Rt-Shoulder Rt-Shoulder1 Rt-Shoulder2 Rt-Shoulder3 Rt-Shoulder3 Rt-Shoulder3 Rt-Shoulder4 Rt-bk curb1 Rt-bk curb2 Rt-bk curb2 Rt-bk curb2 Rt-bk curb3 Rt-bk curb4 Rt-bk curb4 Rt-bk curb5 Name: Description: Parent:	Proposed with Drive Style tc Pavement Cut Cut Fill Sidewalk Sidewalk Sidewalk Sidewalk Sidewalk bkcurb bkcu	Description Created by Generae Created by Roadway Created By Roadway	+	Style Available: Selected: 18-PET Primary: 18-Pipe Add-> 24-Pipe Add-> 30-PET Add-> 30-Pipe Move Up Asphalt Driveway < Remove	Apply Close Fiter ist Points lew Style Help
🔲 Refresh/Disj	play in 3-D/Plan View			I▼ Exclude from Triangulation	

- 3. Review the Pay Item Names listed in the Pay Items List box. The **From Style** column lists whether or not the item is from the feature style. The description is the item's description. If the item is missing from the data as is the case with Item 327A999 it will be reflected here. If there was no database open the description will reflect this as well.
- 4. Delete the item 327A999 since it no longer is a valid pay item name by selecting it from the list and using the delete pay item button located next to the list box.



5. Add the pay item for 5" thick bituminous base previously defined. (327A020 5" thick)



6. Select **Apply**, then **Close** the Feature Properties dialog.

When this feature is quantified, it will contain values for crushed aggregate, bituminous base, wearing surface and two applications of tack coat. Each have their own computation methods and unit for payment but all will be based on the actual paving area.

Lesson Name: Shapes Tool

LESSON OBJECTIVE:

In this lesson you will learn how to create and store closed features in the dtm to calculate quantities.

The Shapes Tool command has been added to assist in closed feature creation. It uses functionality similar to the MicroStation Create Region command. Unlike the Create Region command, these tools create a feature in a dtm when the closed shape is created. Also, station limits (from the active alignment) can be defined to assist in shape creation.

There are two methods to creating a feature shape with this command, Fill and Union. The Fill mode finds elements that encompass a region that can be closed and creates a feature from that area. Union allows selection of multiple adjacent areas to create a single area.

EXERCISE: WORKING WITH THE SHAPES TOOL

This exercise will guide you through the steps to create a shape for computing the area.

 Switch to the Active model "Fill Area" in the DGN file. On the MicroStation Main Menu, select File > Models. From the Models dialog, double click on the "Fill Area" model. This will set it active and swap to the Fill Area model views.

🛣 Mo	dels			k		×
ñ B	1	× 😫 🛅				
Туре	2D/3D	Name	Description		*	
	Ø	Horizontal Alignment	Design			
٥		Торо	Existing Survey			
Ø	Ø	Right of Way	Property Data			
٥	Ø	Untitled Design			\checkmark	
٥	ø	Fill Area	For shapes in QM		\checkmark	
٥	ø	Drainage			\checkmark	
						-

2. Window in on the southern portion of the project.





 Create a closed feature for the area shown as Sod in the sketch above. Select Quantities > Shapes Tool, toggle Shape mode to *Fill*. Verify that the Surface is "Proposed with Drive". For Feature Name, key-in "Sodding". Set the Feature style to "Grassed Areas". Turn on the Dynamics toggle and Apply.



4. Identify the sodded region by a datapoint in the area shown above. Left click to **Accept**. **Reset** (right click) once to restore the command dialog. Your results should be similar to the figure shown.



5. **Close** the Shapes Tool dialog, navigate back to the Model Views.

Exercise: Assigning Pay Items to Graphic Elements

This exercise will guide you through the steps to assign pay items to MicroStation Graphics.

1. Window in to the intersection, as shown (approximately).



2. Place a Smartline as shown (any location will work). This is to represent a guardrail. Level/Symbology is not important.



- 6. Select **Quantities > Assign Pay Items** from the InRoads Explorer Menu.
- 7. The following dialog will be displayed.



8. Enter Guradrail – SW Corner in the Name field.

9. Click the Add Pay Item icon, and add the following item -

P.	ay Items		×
	🚊 💼 630-632 GUAF	IDRAIL, END ANCHORS, GLARE SCREEN	Add
		Steel Beam Guardrail, Class A, Type 1 Linear Feet	
	- 🛞 630A001	Steel Beam Guardrail, Class A, Type 2 Linear Feet	Find
	- 🛞 630A002	Steel Beam Guardrail, Class A, Type 3 Linear Feet	
	- 🛞 630A003	Steel Beam Guardrail, Class B, Type 1 🛛 Linear Feet 👘 👘	Liose
	- 🛞 630A004	Steel Beam Guardrail, Class B, Type 2 Linear Feet	Help
	- 🛞 630A005	Steel Beam Guardrail, Class B, Type 3 Linear Feet	
	- 🛞 630A006	Steel Beam Guardrail, Class A, Type 1 (Installation Only) Linear Feet 💴 🛁	
	- 🎒 630A007	Steel Beam Guardrail, Class A, Type 1 (Wood Posts) Linear Feet	
	- 🎒 630A008	Steel Beam Guardrail, Class B, Type 1 (Wood Posts) Linear Feet	
	<u>_</u> 🛞 630A009	Steel Beam Guardrail, Class A, Type 1 (Double-Faced Median Barrier) Linear Feet	
~	630A010	Steel P I. Class A. J. e J. Klen Nets) Linear Feetmann, J	A. march

Click Add, then Close.

10. The following changes are made to the Assign Pay Item Dialog.

2	Assign Pay Iter	ms			X
Na	ime: Guardrail - S	SW Corner			Apply
	Pay Items				Close
	Name	Description	Measureme	\$	
6	630A000	Steel Beam Guardrail, Clas		-	<u>H</u> elp
				2	
	Override Meas	urement: 0.00			
1					

11. Click **Apply**, and you will be prompted to identify a graphic or a feature. Select the previously created graphic. Accept, then close the Assign Pay Items dialog.

Notice when the cursor passes over the graphic, you get Pay Item Info presented to you.

12. Repeat as desired with other Pay Items. Utilize the Override Measurement option to "fix" the quantity.

Lesson Name: Harvesting Quantities

LESSON OBJECTIVE:

In this Lesson you will learn how to compute quantities for use in Quantity Manager.

Exercise: HARVESTING QUANTITIES BY SHEET

- Turn on the display of all the reference files. This will enable you to see the Plan and Profile sheets. Although we can read the information from the VDF file generated by InRoads Plan and Profile Generator, there is value to the foundation we will discuss in this lesson
- 2. Window in to the southern portion of the file as shown.



3. Place a Fence using the by Element method for the first (southernmost) sheet in the plan assembly. Set the Fence Mode to Clip.

4. Select Quantities > Compute Quantities. The following dialog will display.

Compute 🕯	Quantities	
Main Pay	Items Features Sheet	
Alignment:	Centerline	
Mode:	Fence	Help
Pay Items:	• All • Selected	
Features:	All C Selected	
Graphic El	ements: 📀 All 🛛 🔿 Selection Set	
Output Database:		
C:\2009R	BC\IW-5\QM\QM-all.mdb	
Mode:	💿 Create 🔿 Append	
Phase:	Design	
Run:		
🔽 Deduc	tion Tolerance: 3.00	
🔽 Sheet	Number: 1	
🗖 Purge		
Symbology:		
Object	t Name ht Elements	
	Apply Preferences Close	

Set the output to the current working directory, make sure mode is set to Create, and toggle on the Sheet Number (1). For include, select All on each category.

- 5. Pick **Apply**, then close when complete.
- 6. Pan up the sheet, and repeat for each of the 4 sheets, except use APPEND for the remaining sessions.
- 7. When complete with the last sheet, close the Compute Quantities dialog.

Exercise: Harvesting End Area Volume Quantities

1. In MicroStation, navigate and open C:\2010 RBC Data\CI1WK1\DATA\EA-Vol\EAVolumes.dgn. The following will display:



- 4 -🗃 View 1 - Top, Default [Software Graphics] - U × File Surface Geometry Drainage Evaluation Modeler Site Modeler Drafting Quantities Tools Help - 🔺 🔍 🔍 🗔 🍱 🀱 v 🛛 😵 🖂 Access Mode Туре File Name 3 M Preferences _ I × C:\2009RBC\IW-5\QM\QM.: 😵 Element Se + - - / 🗏 🕂 🗕 🖬 🔇 100 Preferences 🕥 Drainage 📢 🕨 Ready 205 205 200 200 195 шŦ HH I 200 ΠH FA: 0.031 SF 39 + 50100 FV: 0.000 CY CA: 43.754 SF MO: 4020.160 CY 1
- 2. Window in (approximately) as indicated exact station is not important.

3. Select **Evaluation > Volumes > End Area Volum**es from the InRoads Explorer Menu.

File			_ 🗆 🗙
File Cross Section Set Hemfield Road Option 2 File Compute Quantities Compute Quantities Unsuitable Materials by Feature Unsuitable Materials by Station Classifications Compaction/Expansion	Surface Type ✓ Hemfield Existing Existing ✓ Hemfield Finish Design	Method Standard Correct for Curvature Station Limits Use Station Limits Start Station: 23+45.78 top Station: 23+45.78	
 Added Quantities Forced Balance As Built Annotation 	Imperial Units Cubic Yards Cubic Feet Create XML Report	Ignore Areas Smaller Than: 0.00	
		Apply Preferences Close	Help

Select "Create XML Report"

4. Open the "Compute Quantities" Leaf

End-Area Volumes						<u> </u>
File						
Cross Section Set:	🔽 Output Qua	ntities				
Hemfield Road Option 2 End-Area Volumes General Vompute Quantities Unsuitable Materials by Feature	Database: C:\InRoads T Mode: © Cr	raining\InRoads101\EA_Vol_(eate O Append	QM.mdb			
 Unsuitable Materials by Station Classifications Compaction/Expansion Volume Exceptions Added Quantities 	Run:	n				
Forced Balance	Object	Name	Description		5	
As Built Annotation	Cut Fill Borrow Waste	210A000 - CUT 210A000c - FILL 210A000b - BORROW 210A000w - Waste	CUT FILL BORROW Waste			
			Appl	y Preferences	Close	Help

Select "Output Quantities" and specify the Output database (use the working directory – NOT the sample indicated above). Note – for this portion, we are using a Quantity DB that is NOT the "Final" (this is for your use – to enable you to see what is captured in End Area Volumes).

Make sure the Phase is populated; the basic delivered reports do not work in "All Phases" mode, and keep the phase designation consistent throughout this exercise.

Click the check box next to each of the pay items, click in the "Name" field, and using the add pay item (green \$) box at the upper right of the pay item grid, add the Pay Items for Cut, Fill, Borrow, and Waste.

Note: The formulas attached to the pay items through Pay Item Manager do not apply in this case.

Regarding Borrow and Waste -

If the Mass Ordinate value is negative when completing the End Area Volumes, the Borrow field will be populated with the quantity required to balance the earthwork. If the value is positive, then the Waste field will be populated with the quantity of extra materials.

5. Click the Apply button and the following takes place -

The new EA Volumes Quantities DB specified will be created, and the InRoads Report Browser will open to display the EA Volumes Report. Scroll down to the bottom of the report (right side) and note the Cut and Fill Quantities.

Bentley Civil Report Browser - C:\DOCUME~1\Admin\LOCALS File Tools Help	~1\Temp\RPT5	5.xml							
C:\Program Files\Bentlev\InRoads Group V8.11\XML Data\	63+04.92	1.00	0.00	0.0	0.0	1.00	242.26	44.5	44.5
	63+35.63	1.00	0.00	× 0.0	0.0	1.00	211.87	258.2	258.2
	63+50.00	1.00	0.00	0.0	0.0	1.00	196.29	108.6	108.6
Arrongeenessiopenession	64+00.00	1.00	0.00	$\times \infty$	0.0	1 00	149 36	320.0	320 (
A BasicVolume.xsl	64+50.00	1 00	0.00	0.0	0.0	1 00	112 72	242.7	242 7
CrossSection.xsl	65 100.00	1.00	0.00		0.0	1.00	02.47	100.0	100.0
CrossSectionAllFeatures.xsl	65+00.00	1.00	0.00	0.0	0.0	1.00	93.47	190.9	190.5
CrossSectionASCIIInputFormat.xsl	65+50.00	1.00	0.00	0.0	0.0	1.00	56.73	139.1	139.1
CrossSectionASCIIInputFormatFeature.xsl	66+00.00	1.00	0.29	0.3_	0.3	1.00	23.70	74.5	74.5
CrossSectionASCIIInputFormatWithPencodes.xsl	66+50.00	<u>1.00</u>	13.63	12.9	<u> </u>	/1.00	3.70	25.4	<u> </u>
CrossSectionDesignSurfaceFeatures.xsl	67+00.00	1.00	33.76	43.9	43.9	1.00	1.11	4.5	4.5
CrossSectionGradebook.xsi	67+50.00	×1.00	51 87	79.3	79.3	1.00	<u>_0 01</u>	1.0	× 1
CrossSectionGradebookW/de vsl	68+00.00	1 00	63.95	107.2	107.2	1.00	0.00	×	
A CrossSectionPoints.xsl	68104.30	1.00	64 70	107.2	10.2	1.00	20.00	0.0	XX
CrossSectionPointsList.xsl	00+04.29	1.00	04.12	10.2	10.2	1.00	0.00	× 0.0	
CrossSectionProfileList.xsl	68+50.00	1.00	67.66	112.0	112.0	1.00	0.00	0.0	X 0,0
	68+88.55	1.00	62.89	93.2	93.2	1.00	0.00	0.0	0.0
CrossSectionStakingTable.xsl	69+00.00	1.00	60.31	26.1	26.1	1.00	0.00	0.0	0,0
CrossSectionsToCSV.xsl	69+50.00	1.00	48.27	100.5	100.5	1.00	0.00	0.0	0.0
CrossSectionSurveyFormat.xsl	70+00 00	1 00	38 09	80.0	80 0	1 00	0 04	0.0	00
CrossSectionWide.xsl	70+33.21	1.00	33 67		1 11	1.00	0.24	0.2	\sim
LrossSectionXYZ.xsi	70.50.00	1.00	33.07		40.5	1.00	0.24		
At EndArcol/dume.vol	70+50.00	1.00	0.00	10.5	10.5	1.00	0.00	<u> </u>	~ 2
All Endérea/JolumePageTotals vsl	10+51.54	1.00	0.00	<u> </u>	0.0	1.00	0.00	0.0	0.0
		×-	× ×	Ť.	X X	Å.	×	t Át	XX
A MultipleMateria/Volumes.xsl	Grand Total:		9843.8	9843.8			7813.6	7813.6	
TriangleVolumes.xsl		\times	$\leftarrow \times$	\rightarrow	XX	X	$\times \rightarrow$	\rightarrow	XX
TriangleVolumesSumShapes.xsl									
Volumes.xsl	•								

Scroll the report to the right and note the Mass Ordinate value is a positive number, this indicates a value should be populated in the Waste field.

- 6. Close the InRoads Report Browser and the End Area Volumes dialog and open Quantity Manager.
- 7. Specify the previously created Quantities Database and connect.

8. The following items will be displayed

🙀 Quantity Manager - C:\InRoads Training\InRoads	101\EA_Vol_Q№	1.mdb				
Project Edit View Insert Tools Help						
	Phase : Desig	n	V			
Payitem Tree Payitem Table	Category	Payitem	Phase	Chain	Net Valu	
Content of the second	4	1				
	Paver Participation			Funding Participa		
	Name	Туре	Radius	Delta	Length	

- 9. Make sure Phase is set to Design, navigate through the Pay Items listed (note the station, etc.).
- 10. Select "root" at the top of the Pay Item Tree, the select Tools>Reports>Create and choose the Sample Pay Item Summary (HTML)

Create Report X
Active Phase: Design
Report Style: Sample Pay Item Summ 💌
Report Type: HTML
Report File Name: InRoads 101\EA_Vol_QM.html
Starting Page Number: 1
Report Only Selected Quantities
Create Cancel

Specify an output file and click the Create button.

11. The following HTML file will be displayed

e. (intodus fruining	\InRoads 101\	EA_Vol_QM.ht	ml - Window	s Internet Explore	r	
🗩 🗢 🖉 C:\InF	Roads Training\Inl	Roads 101\EA_\	/ol_QM.html			
le Edit View Favo	orites Tools I	Help				
- Favorites 🛛 👍 🏉	Suggested Sites	🝷 📶 Free Hot	mail 🤌 Get	More Add-ons 🔹		
C:\InRoads Training\InRoads 101\EA_Vol_QM.html						
Name	Description	Unit	Unit Cost	Total Quantity	Total Cost	
210A000 - CUT	CUT	Cubic Yard	0.0	9843.75	0.00	
210A000 - FILL	FILL	Cubic Yard	0.0	7813.61	0.00	
	Waste	Cubic Yard	0.0	2030 14	0.00	

- 10. Close all browser, report, and Quantity Manager windows and return to InRoads.
- 11. Re-Run the same End Area Volumes, but this time append to the database "QM-all" created in the earlier lesson.
- 12. Open Quantity Manager again, connect to QM-all, and review.
- 13. Generate Summary Reports as previous, notice the inclusion of End Area Volumes.