Validation of Exported Field Data in GEOPAK Drainage (Survey to Drainage)

1.1 Overview

The Export to GEOPAK Drainage tool can be utilized to leverage data collected by field surveys (i.e., pipes and structures) into a GEOPAK Drainage project. This can be extremely useful when the current system is changed or augmented with new structures, which is often the case in today's transportation and site projects.

Note: GEOPAK Drainage is not required to export to Drainage, but is needed to open the drainage project for subsequent review.

The key to leveraging survey data into drainage is GEOPAK's ability to determine the feature code within Surveys and its relationship to items within the GEOPAK Drainage Library. This association between the Survey Manager Database and the Drainage Library is a Data Dictionary file. This file (not to be confused with the data dictionary files on many data collectors and GPS equipment) is an ASCII file, which associates each Feature code, which could be used for drainage applications and the Item within the Drainage Library. This file can be set up based on the organization's SMD and DLB; therefore, one file can be utilized throughout the organization.

Survey points are utilized for the structures (referred to as nodes within GEOPAK Drainage), while survey chains define the pipes (referred to links within GEOPAK Drainage.)

GEOPAK scans the specified Coordinate Geometry (GPK) file, which contains the field data, compares each feature name (and size for pipes) to the Data Dictionary file, and then displays any item for which a match is found. In this way, nodes and pipes are displayed, while non-drainage items (such as trees and fences) are not utilized. Once the items are displayed, the user has the option to use only those items for a particular processing. In this way, any items that are outside the area on interest may be removed from consideration.

When processed, GEOPAK finds the node with the lowest invert and assumes this is an outlet. Then it finds all connected pipes and that becomes a network. Then the process is repeated until all nodes and links are part of a network.

The pipes, links, and networks are stored in the specified Drainage Project File. Using GEOPAK Drainage, the user can then review, modify or utilize the information within the design or upgrade of the drainage project.

1.2   Deliverables from Surveys

The following deliverables should be received from the Survey personnel:

- GPK file
- Survey Design file
- Drainage project (gdf) file

1.3   Reviewing Drainage Project Information

When the Export to Drainage process is completed, review of the drainage project is prudent. A comparison of the survey data and its subsequent location in the drainage project is detailed below.

1. Open a blank MicroStation 3D file and attach the 3D Surveys file. Fit so the surveys data is visible.

2. Open the drainage project supplied by Surveys. By selecting

a.) **Applications>Drainage>Drainage.**

b.) Then select **Project>Open** and select the drainage gdf from the drainage pull-down.

c.) Select **Drainage > Network > Edit**.

The Dialog below is used to build (Validation) the networks. Each network is built individually . First select the **Network ID** (top left of dialog) then Select the **Build Network** icon (bottom left of dialog).
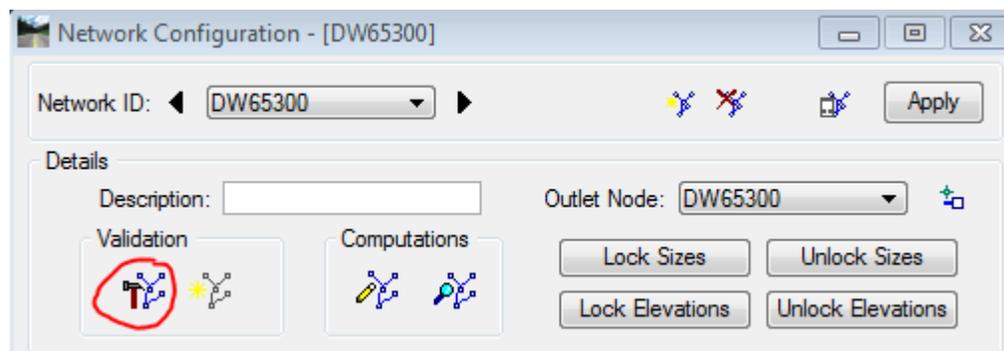
When the Network is built within Drainage, the number of Nodes and Links in the Information dialog matches the number of Nodes and Links in the Export dialog. Now build the remainder of the networks.
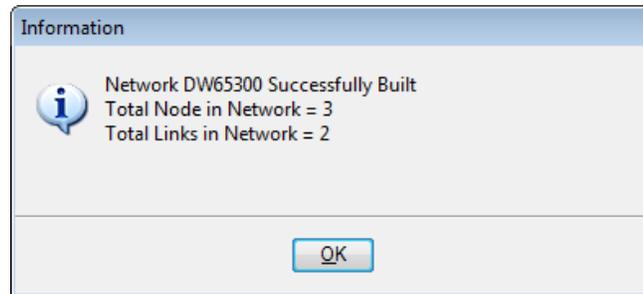
3. Now select **Utilities>Navigator**. The dialog below displays the Drainage Navigator in the Link mode.
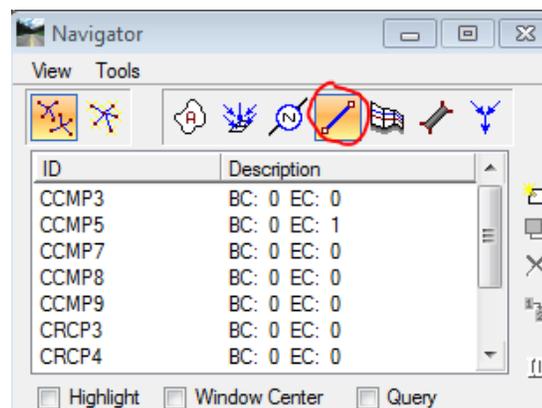
Next, review an individual entry for a Link (in this example (CCMP3) by a double-click on the link you want to review from the Navigator.

Note the **Shape**, **Material**, **Size**, **Manning's n**, and **Override Library Pay item** are populated from the Exporting process.
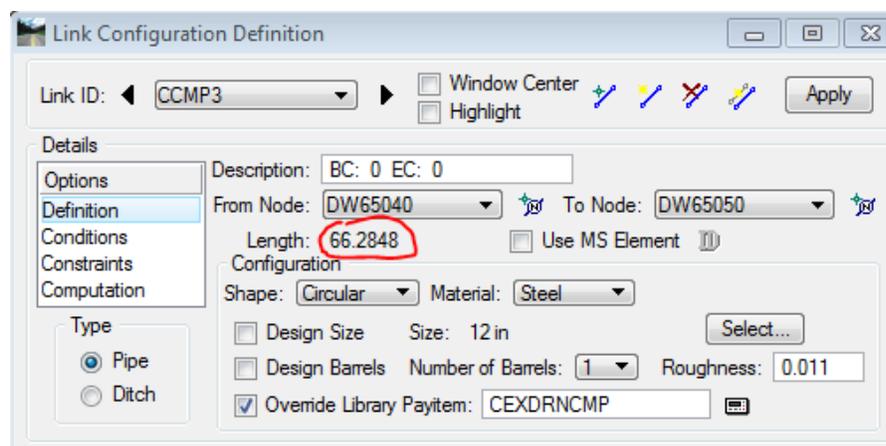
The **Length** in the drainage dialog can be verified by selecting **DESCRIBE SURVEY CHAIN CCMP10** in COGO as shown below.
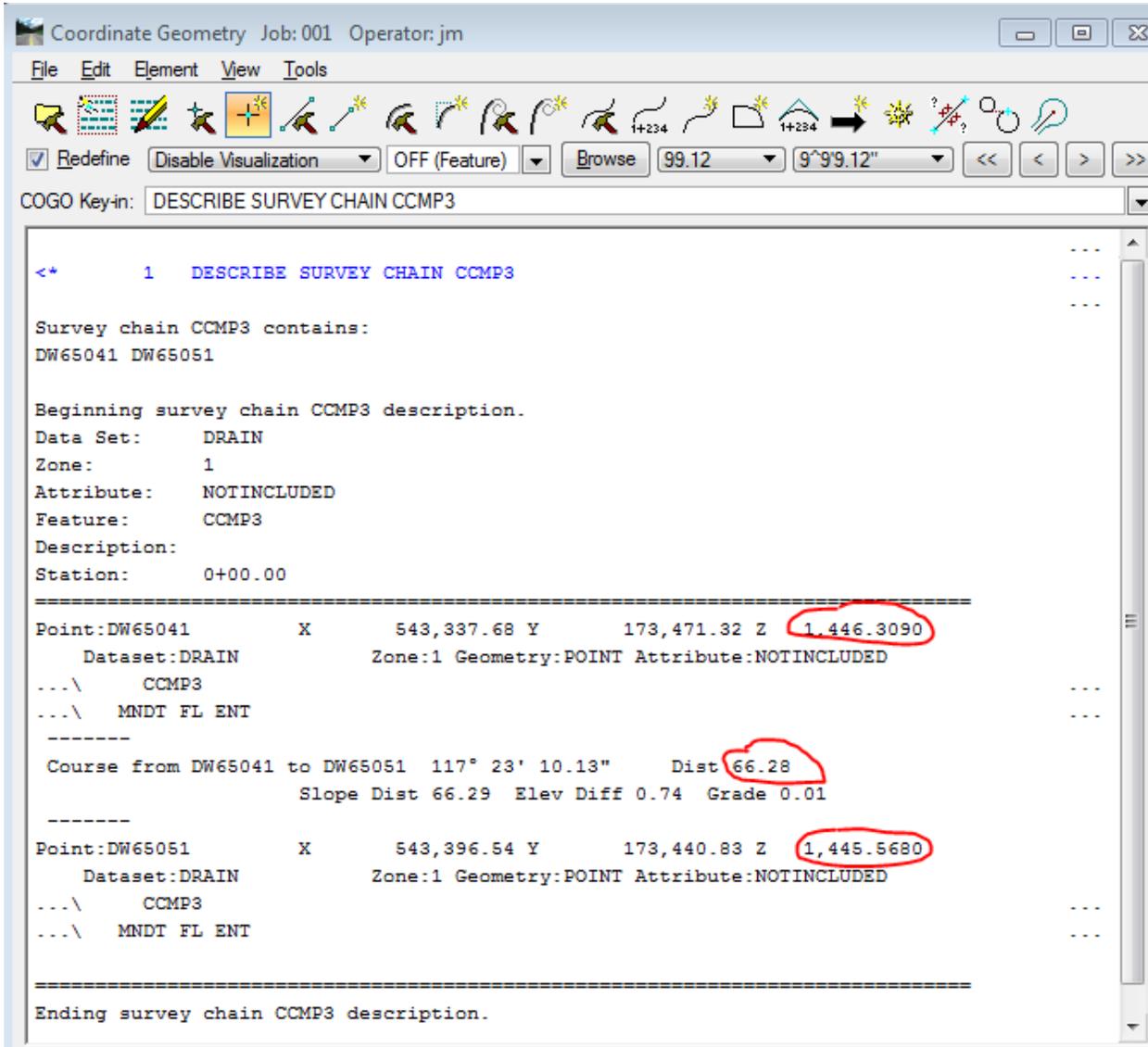
The elevations of the links can also be verified by reviewing the two points in COGO and the Link dialog in the Conditions option. The sample COGO dialog below has the two shots for **CCMP10**. The dialog below depicts the same pipe, the Link Configuration Dialog. Note the two-invert elevations match the two elevations in the COGO dialog above.
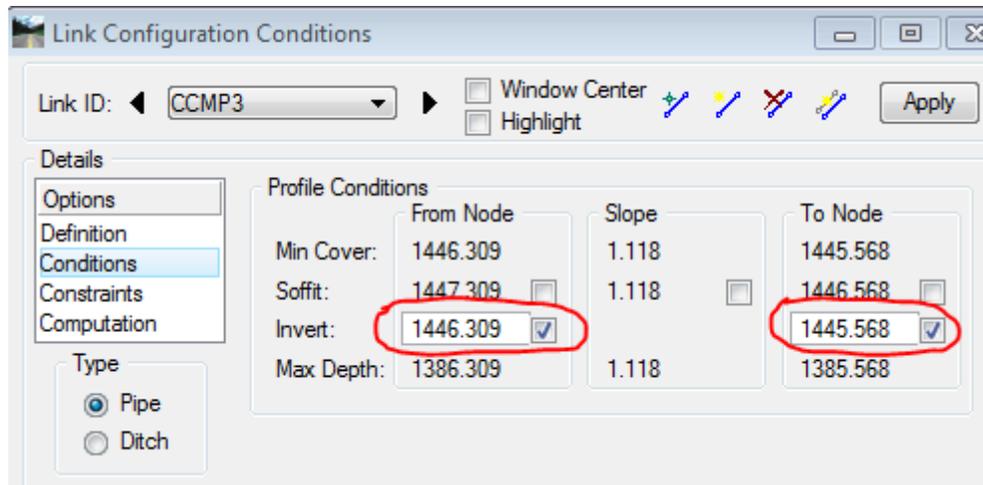
1.4   Drawing Drainage Project Information

1.   If not done in 1.3.1, open a blank MicroStation 3D file and attach the 3D Surveys file. Fit so the surveys data is visible.

2.   Open the drainage project supplied by Surveys.

3.   Select **Drainage > Project > Preferences > Project Components.**

Verify that the Drainage Library Files (DLB) is
S:\MndotV8Stds\DOT_GEOPAK\dlb\hyde.dlb

Verify that the GPK Job Number is correct and the the Road Preferences are set correctly

Verify that the Drainage Cell Files is
S:\MndotV8Stds\DOT_MICRO\cell\hydro.cel

Verify that the GEOPAK DDB is
        S:\MndotV8Stds\DOT_GEOPAK\db\english.ddb

4.   Select **Drainage > Utilities > Navigator** and review the networks.

5. To draw the pipes, highlight all links in the Navigator, and select **Tools > Update Pay Items**. This will draw the flow arrows (using the linestyle **SEW(R)**)
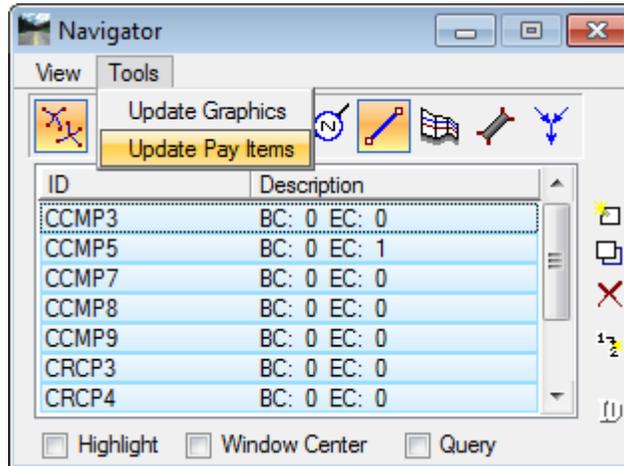
6. To draw the structures, highlight all nodes in the Navigator, and select **Tools > Update Pay Items**.
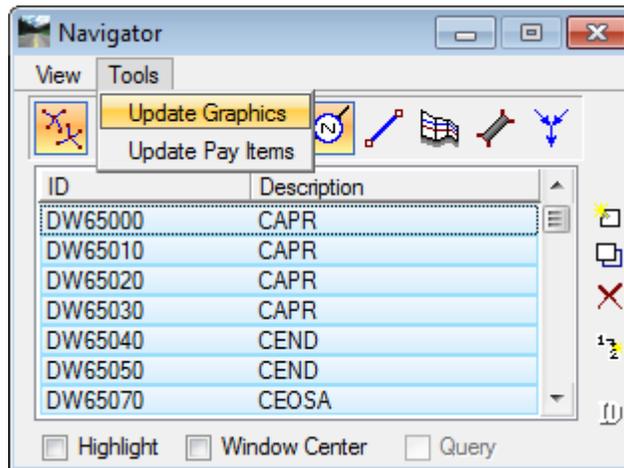
1.5 Set to Project Chain and Offset

1. Select the GPK file with the chain you are assigning has been set in the Preferences.
2. Select **Project>Preferences>Project Components**
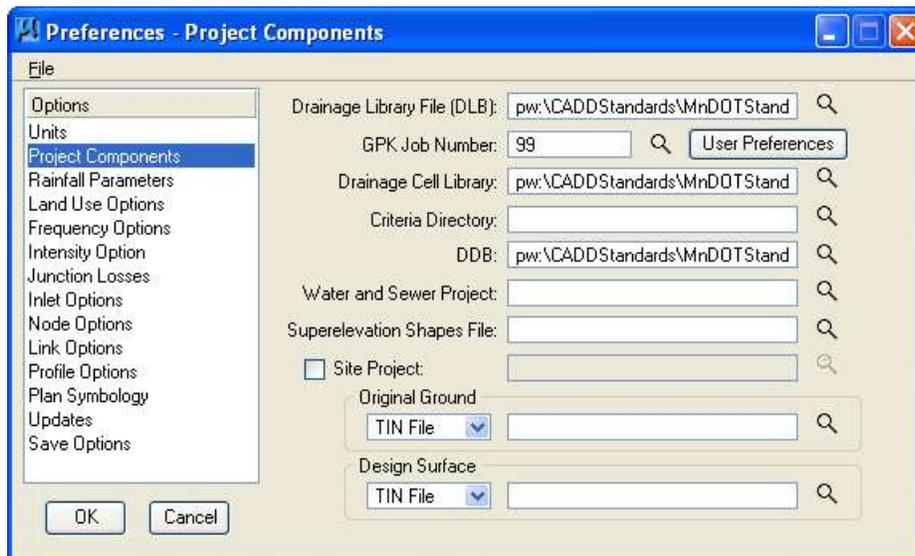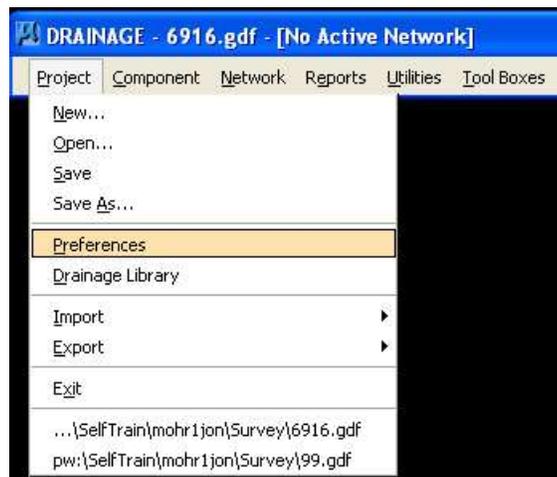
2. Open the Drainage Navigator   (**Drainage > Utilities > Navigator**).

3. Set the Active Component Type to Node. Select all the Nodes that you wish to assign the alignment to. Load Global Editor (View/Global Editor).
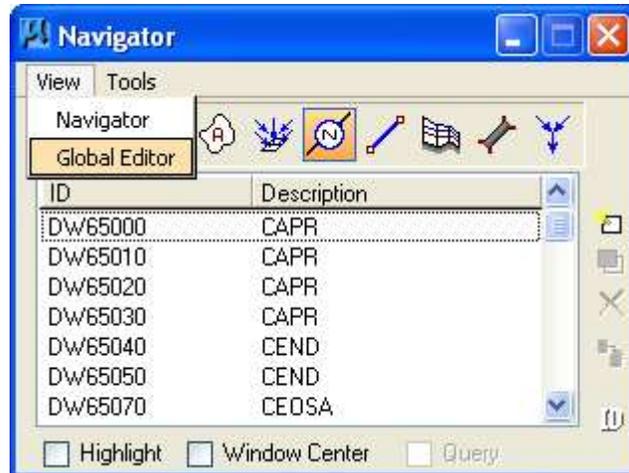
4. Choose variable to edit: Node - Reference Chain. Turn on button Overwrite Text, and type in Chain name. Left-click **Apply Edit No Confirm** button (at this point, if you look at one of the nodes, the alignment should have been assigned, but the station won't have been updated yet).
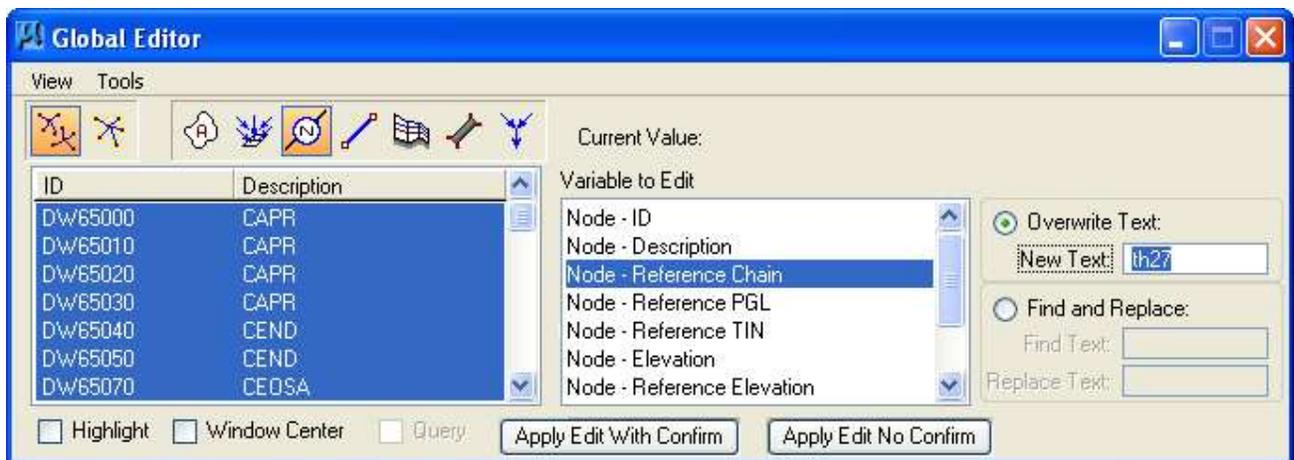
5. Back in Navigator, select all of the nodes (or all for which alignment assigned).

6. Tools/Update Graphics - now station/offset should be updated for each of these nodes.

7. To Verify the chain, station, and offset Select **Drainage > Component > Node > Location**. For each of the nodes you changed.

1.6 Create Existing Tabulation Sheet

1. Select **MnDOTMenu > VBA > Drainage > Drainage Tabulation** from MicroStation Tool Bar.
2. Select the **Drainage Database (gdf)** you want to tabulate.

3. Select **Inplace Drainage Table** for Table Type
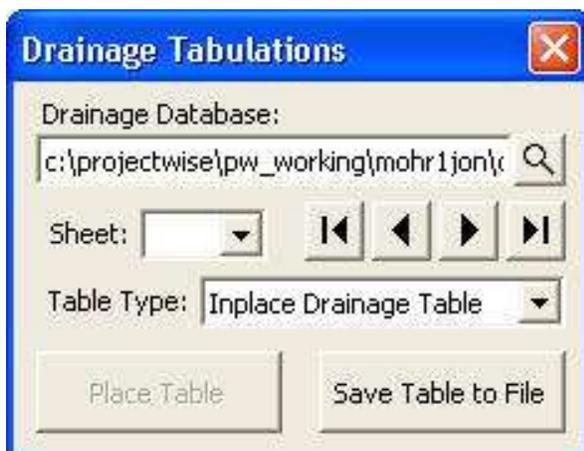
Note: This vba creates a table for all of the nodes and links within the gdf.

4. Save the Microsoft Excel file.
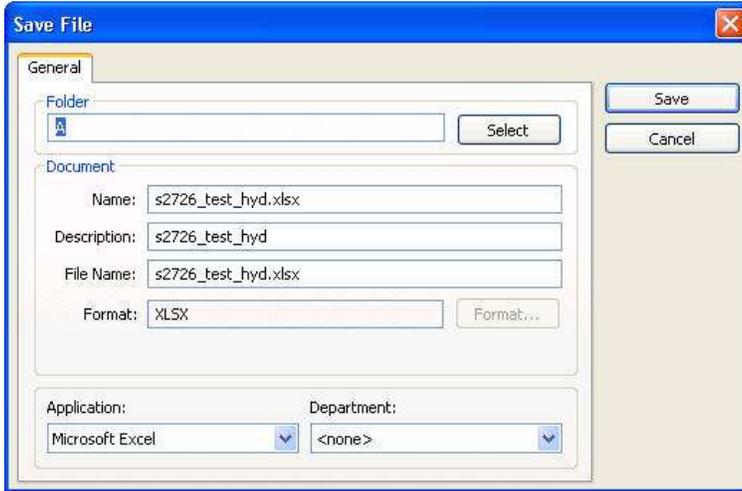
5. Wait until the Table Complete dialog displays, select **OK**

6. Open the Excel file you just created.

		STRUCTURE LOCATION					DRAINAGE STRUCTURES						PIPE SEWER			
STRUCT NO.	FLOWS TO	ALIGN	CASTING		BOTTOM		TYPE		CASTING ASSEMBLY TYPE	STEPS REQ'D	CONE TYPE	TOP OF CASTING ELEV	OUTLET ELEV	INLET ELEV DOWN STREAM STRUCT	18" CPP	10" PVC
			STATION	OFFSET	STATION	OFFSET										
DH61810	DH61820		114+05.61	24			CB	4.5	Existing Grate			847.28	842.78	843.29	75	
DH61810	DH61860		114+05.61	24			CB	4.6	Existing Grate			847.28	842.68	842.31	51	
DH61060	DH61090		135+24.19	-21			CB	2.4	Existing Grate			836.22	833.82	831.69		44
DH61070	DH61080		134+31.85	-25			CB	2.5	Existing Grate			837.27	834.77	834.34		51
DH60960	DH60970		145+44.89	34			MH	4.8	Existing Manhole			840.69	835.89	836.63		20
DH60970	DH69920		145+62.22	23			MH	3.5	Existing Manhole			840.33	836.83	836.87		11
DH60330	DH60340		169+58.79	-21			CB	2.7	Existing Grate			835.15	832.4	831.85		16
DH61260	DH61270		174+28.95	-21			CB	2.9	Existing Grate			833.54	830.64	829.08		45
DH61330	DH61320		174+29.25	21			CB	2.8	Existing Grate			833.8	831	829.18		45

Table title: INPLACE DRAINAGE TABULATION

7. There are empty columns you should hide.
8. Modify as needed and import tab into a dgn using Axiom Office Importer.