

PENNDOT STRUCTURE BORING LOG INSTRUCTIONS

gINT

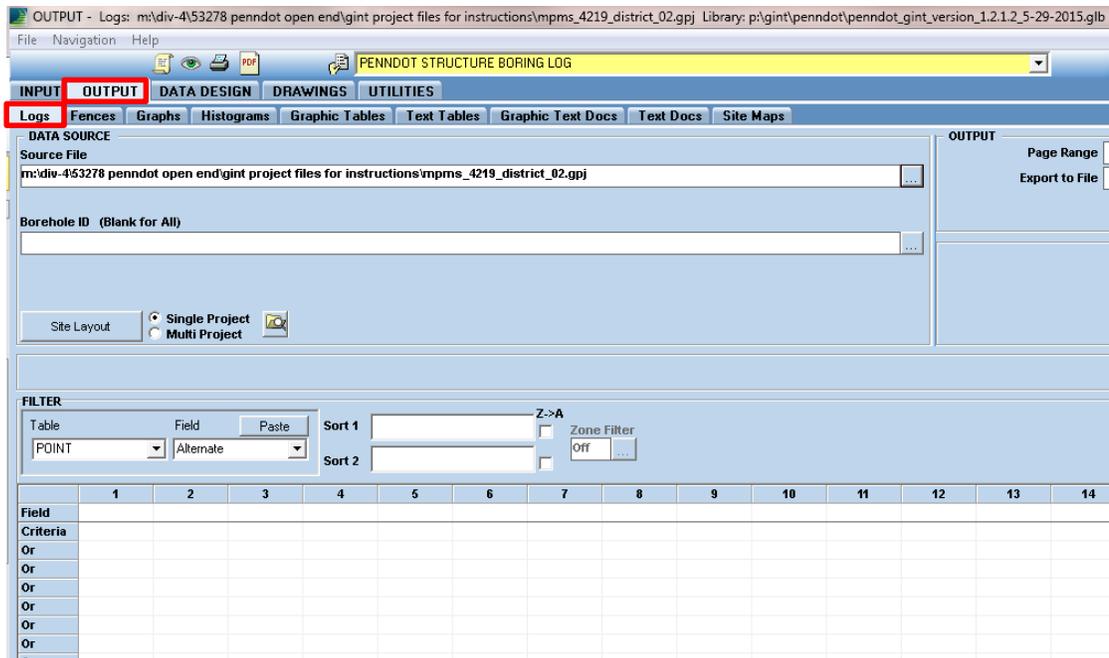
1. Prior to exporting and creating the structure boring logs check that the following information has been input into gINT for each boring.
 - Subsurface data from the field investigation
 - Survey information: Stations, Offsets, and Elevation
 - Complete laboratory test data
 - Substructure Unit, substructure number
 - Foundation type, foundation elevations, and Top of Rock (If applicable).
 - 0 hour and 24 hour groundwater level readings
 - Include all other information that is required for Structure Boring Logs as follows:

SUBSTRUCTURE UNIT: WINGWALL 1		LOG 1 OF 1	
BORING NUMBER: S1-01	BORING LOCATION STATION: 2288+58.0 OFFSET: 43.0 ft. LT.	START: 10/28/2008 9:00 AM FINISH: 10/28/2008 3:00 PM	HAMMER: AUTOMATIC EFFICIENCY: 0.6 ERm
DRILLING METHOD AND EQUIPMENT: DBLE. TUBE WIRE LN-NQ, AUTOMATIC, CME MODEL 55		SIZE OF CORE: 1.874"	VERTICAL SCALE: 0 FT. 5 FT. TOP OF BORING ELEVATION: 455.0 FT.
DRILLING INSPECTOR: NAME OF INSPECTOR DRILLER & DRILLING COMPANY: NAME OF DRILLER NAME OF DRILLING COMPANY		▽ 0 HR. READING - ELAPSED TIME: NR - NR ▼ 24 HR. READING - ELAPSED TIME: NR - NR	

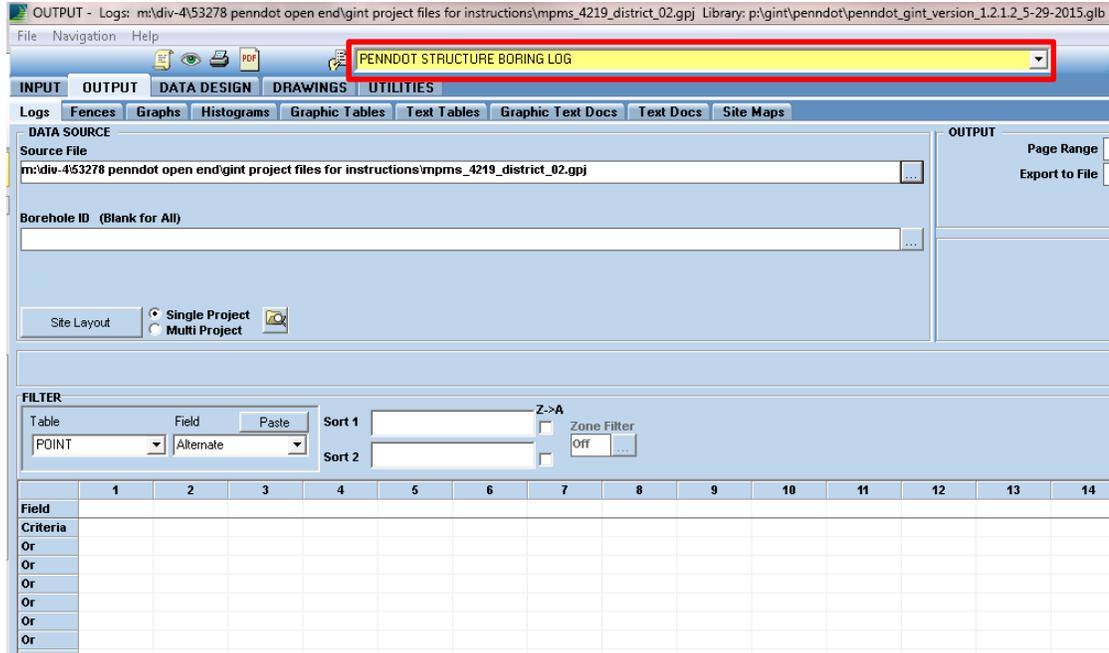
2. To export boring information from gINT, the following protocol must be followed;
 - Open the proper project file that contains the boring information

Structure Boring Log

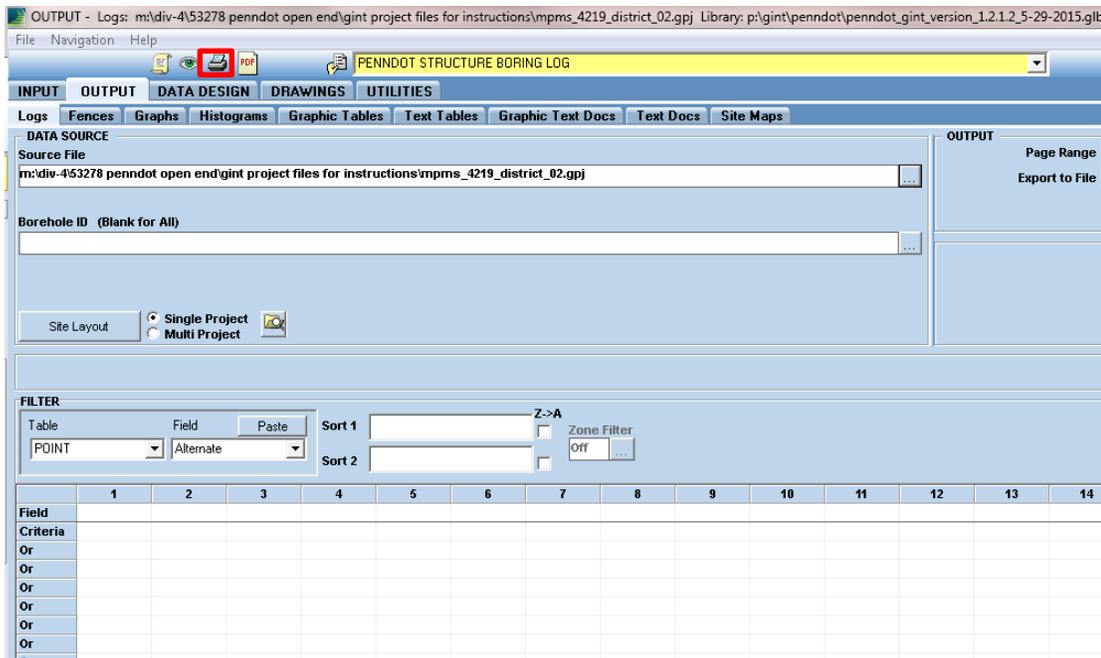
- Under the "Output" tab, click on the "Logs" tab



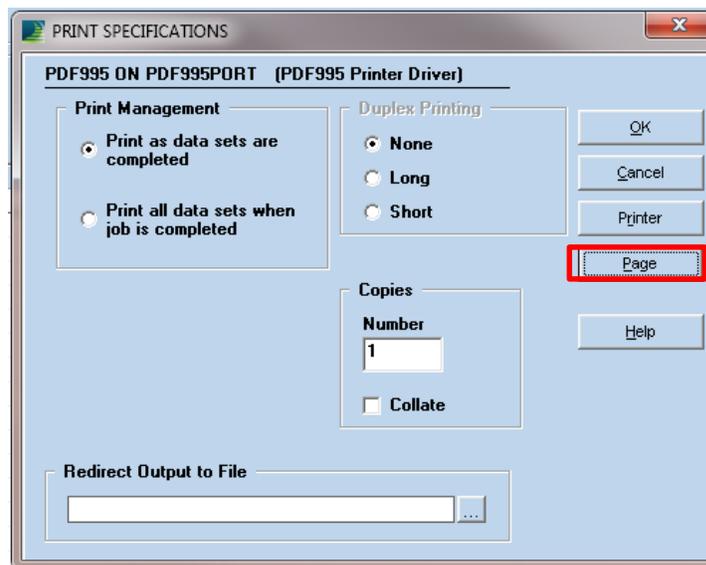
- From the drop down menu at the top of the page (bright yellow), select “PENNDOT STRUCTURE BORING LOG”



- Change paper size to 12” by 18”
 - Click the printer icon at the top left side of the page

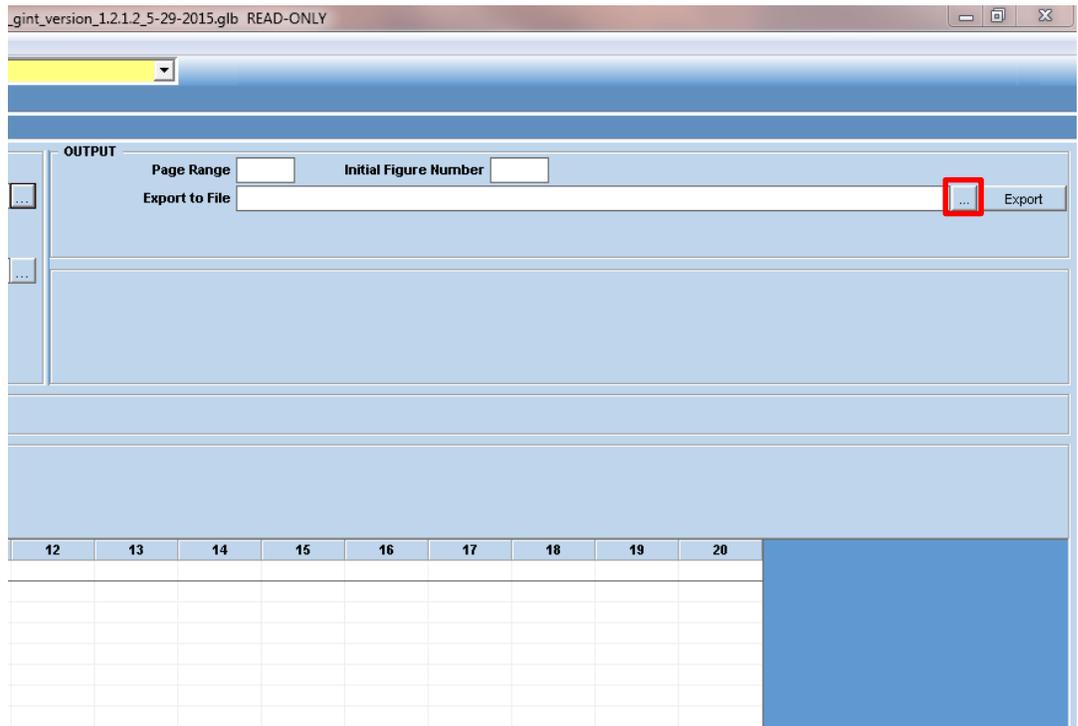


- Select “Page”

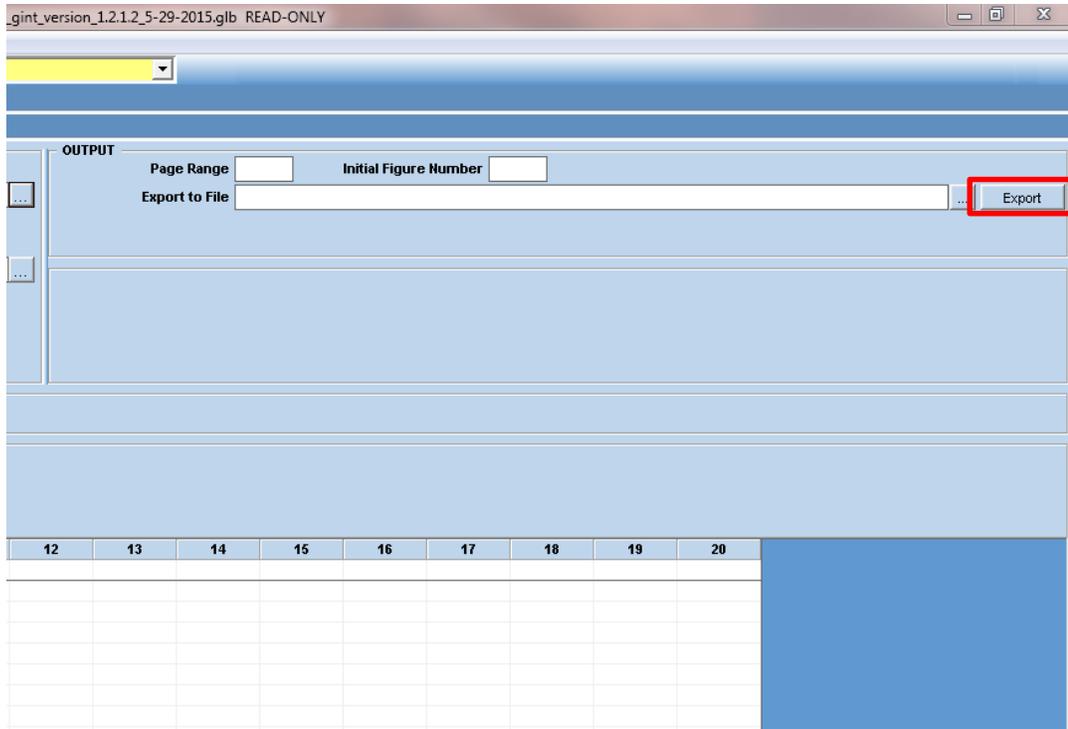


- From the “Page Size” drop down menu, select 12” x 18” or “Arch B” depending on the default printer configuration

- Under Output: click the square box to the right of the “Export to File” selection box and select the proper location for filing



- Give the file a representative name (ProjectName_StructureBoring1.pdf)
 - Save the file in .pdf format
 - Click “Save”
- Click “Export” to the right of the “Export to File” selection box

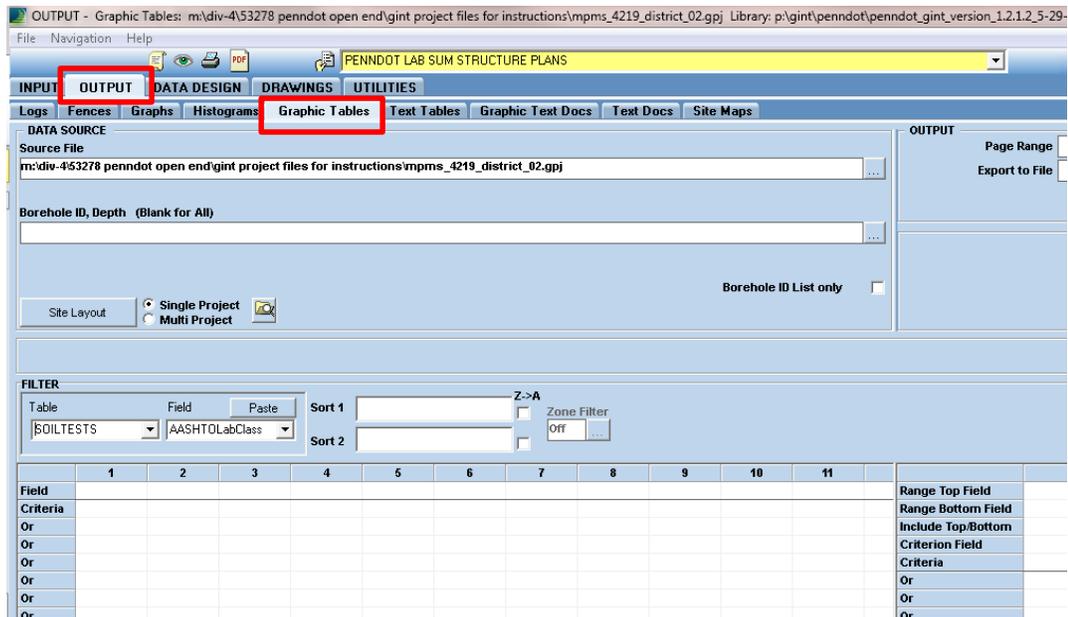


- The tracing is now exported into a .pdf file and can be referenced into Microstation

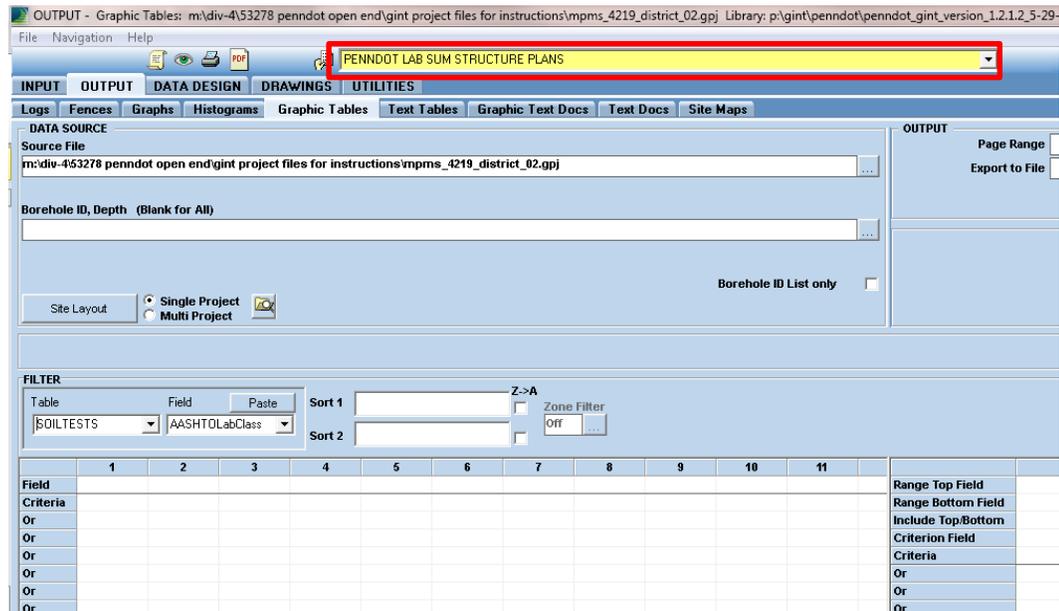
Note: Microstation only recognizes one page of a .pdf file. If a boring has multiple pages, break into multiple .pdf files (one for each page)

Soil Lab Summary Table

- Under the “Output” tab, click on the “Graphic Tables” tab



- From the drop down menu at the top of the page (bright yellow), select “PENNDOT LAB SUM STRUCTURE PLANS”

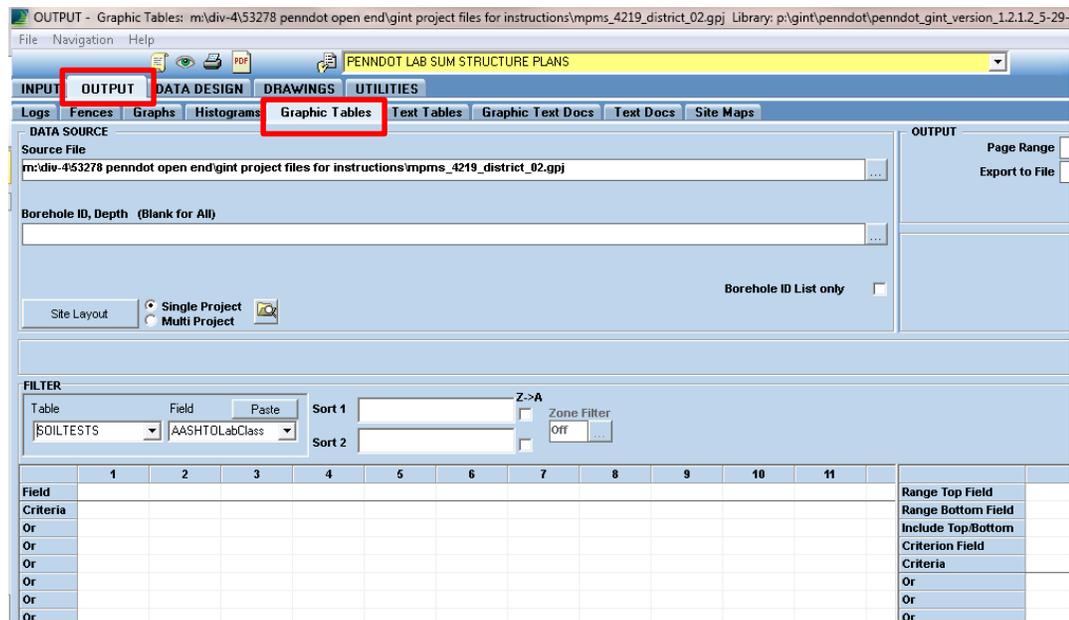


- Click the box to the right of “Borehole ID” selection box and select all of the borings that contain lab testing having the same S-Number as the structure that you are creating the structure boring logs for. You may use the Filter and Field Criteria available on the Output tab, or manually select the borings. For gINT users not familiar with the “Filter” feature in gINT, please see the Filtering Lab Test Results section on page 10.
- Note: If gINT project file includes only one structure, this will include all borings that contain lab test information on the list.
- Under Output: click the square box to the right of the “Export to File” selection box and select the proper location for filing
 - Give the file a representative name (ProjectName_SoilLabSummaryTable.pdf)
 - Save the file in .pdf format
 - Click “Save”
 - Click “Export” to the right of the “Export to File” selection box

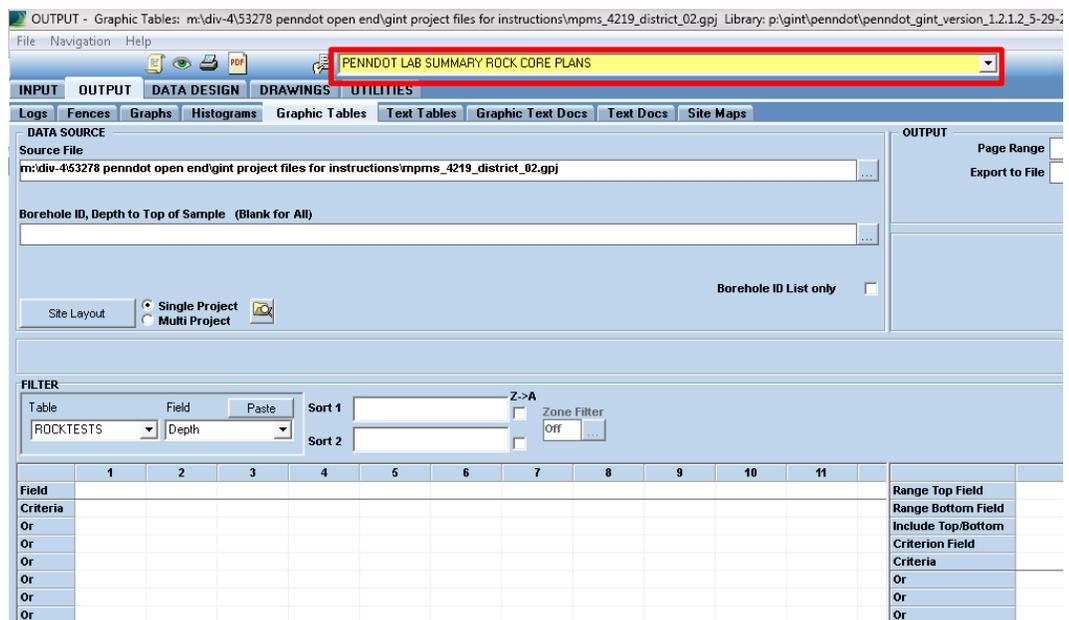
The soil lab summary table is now exported into a .pdf file and can be referenced into Microstation

Rock Lab Summary Table

- Under the “Output” tab, click on the “Graphic Tables” tab



- From the drop down menu at the top of the page (bright yellow), select “PENNDOT LAB SUMMARY ROCK CORE PLANS”



- Click the box to the right of “Borehole ID” selection box and select all of the borings that contain lab testing information having the same S-Number as the structure that you are creating the structure boring logs for. You may use the Filter and Field Criteria available on the Output tab, or manually select the

borings. For gINT users not familiar with the “Filter” feature in gINT, please see the Filtering Lab Test Results section on page 10.

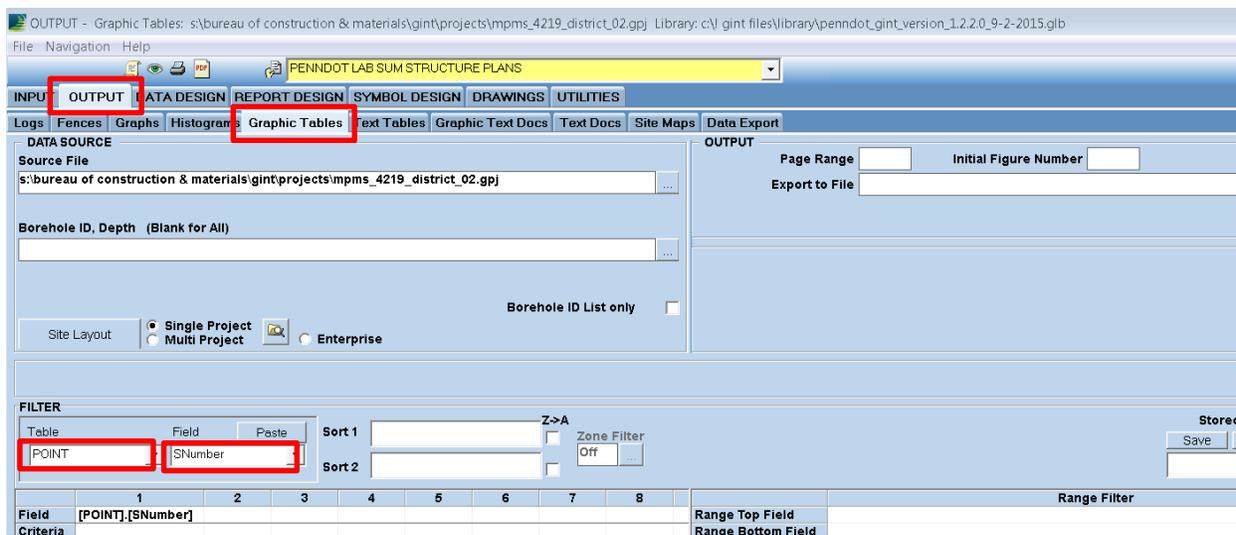
Note: If gINT project file includes only one structure, this will include all borings that contain lab test information on the list.

- Under Output: click the square box to the right of the “Export to File” selection box and select the proper location for filing
 - Give the file a representative name (ProjectName_RockLabSummaryTable.pdf)
 - Save the file in .pdf format
 - Click “Save”
- Click “Export” to the right of the “Export to File” selection box

The rock lab summary table is now exported into a .pdf file and can be referenced into Microstation

Filtering Lab Test Results

- Under “Filter”, on the “Graphic Tables” tab in “Output”, select from the “Table” drop down “Point/Boring Test Pit”.
- From the “Field” drop down select “SNumber/S-Number”



- Select the blank box under “Field 1”. Then click on Paste and “Field 1” will be automatically filled.

FILTER

Table: POINT Field: SNumber **Paste** Sort 1: Z->A Zone Filter: Off

Sort 2: Zone Filter: Off

	1	2	3	4	5	6	7	8	
Field	[POINT].[SNumber]								Range Top Field
Criteria									Range Bottom
Or									Include Top/Bottom
Or									Criterion Field
Or									Criteria
Or									Or

➤ Adjacent to "Criteria" specify filtering criteria, in this case "Like 30733"

FILTER

Table: POINT Field: SNumber **Paste** Sort 1: Z->A Zone Filter: Off

Sort 2: Zone Filter: Off

	1	2	3	4	5	6	7	
Field	[POINT].[SNumber]							
Criteria	Like 30733							
Or								
Or								
Or								
Or								
Or								
Or								

➤ Preview the table

Exit Preview Edit File

LABORATORY TEST SUMMARY - SOILS																							
BORING NUMBER	STATION & OFFSET	SAMPLE #	TEST DEPTH (FT.)	NATURAL MOISTURE %	% GRAIN SIZE DISTRIBUTION (SIGHT)							CLASSIFICATION		PLASTICITY PARAMETERS				SHEAR STRENGTH				TEST METHOD	
					GRAVEL %	SAND %	COARSE SAND %	FINE SAND %	FINES %	SILT %	CLAY %	AASHTO	USCS	S.O.	LIQUID LIMIT	PLASTIC LIMIT	P. I.	C (TSF)	C' (DEG.)	C (TSF)	C' (DEG.)		
S1-02	2289+42.0 29 ft. RT.	S-2 to 7	3.0 to 12.0	8.0		25.0			25.0	75.0	35.0	40.0	A4	SP-SM	2.71	NP	NP	NP	32.0	31.0	TRIA/AL-CD		
S1-03	2289+45.0 9 ft. RT.	S-2 to 9	12.0 to 15.0	8.0									A4	ML	2.68	10	4	6	29.0	0.080	28.0	DIR. SHR.-CD	
S1-03	2289+45.0 9 ft. RT.	S-4 to 14	20.0 to 22.0	5.0									A4	ML	2.65	9	4	5	0.007	32.0	0.050	26.5	TRIA/AL-CD
S1-04	2289+40.0 28 ft. LT.	S-1 to 12	1.5 to 19.5	14.1				40.0	60.0	30.0	30.0		A4	ML	2.79	23	15	8	18.2			DIR. SHR.	

➤ Export to PDF...

LABORATORY TEST SUMMARY - SOILS																							
BORING NUMBER	STATION & OFFSET	SAMPLE #	TEST DEPTH (FT.)	NATURAL MOISTURE %	% GRAIN SIZE DISTRIBUTION (AASHTO)							CLASSIFICATION			PLASTICITY PARAMETERS			SHEAR STRENGTH					
					GRAVEL %	SAND %	COARSE SAND %	FINE SAND %	FINES %	SILT %	CLAY %	AASHTO	USCS	S.G.	LIQUID LIMIT	PLASTIC LIMIT	P. I.	C (TSF)	φ (DEG.)	C' (TSF)	φ' (DEG.)	TEST METHOD	
S1-02	2288+82.0 29 ft. RT.	S-2 to 7	3.0 to 12.0	8.0		25.0			25.0	75.0	35.0	40.0	A-4	SP-SM	2.71	NP	NP	NP		32.0		31.0	TRIAxIAL-CD
S1-03	2288+93.0 9 ft. RT.	S-2 to 9	12.0 to 15.0	8.0									A-4	ML	2.66	10	4	6		29.0	0.060	28.0	DIR. SHR.-CD
S1-03	2288+93.0 9 ft. RT.	S-4 to 14	20.0 to 22.0	5.0									A-4	ML	2.65	9	4	5	0.007	32.0	0.050	26.5	TRIAxIAL-CD
S1-04	2289+00.0 28 ft. LT.	S-1 to 12	1.5 to 19.5	14.1					40.0	60.0	30.0	30.0	A-4	ML	2.79	23	15	8		16.2			DIR. SHR.

Note: Users may specify search criteria for other graphic tables to best filter the data for the application.

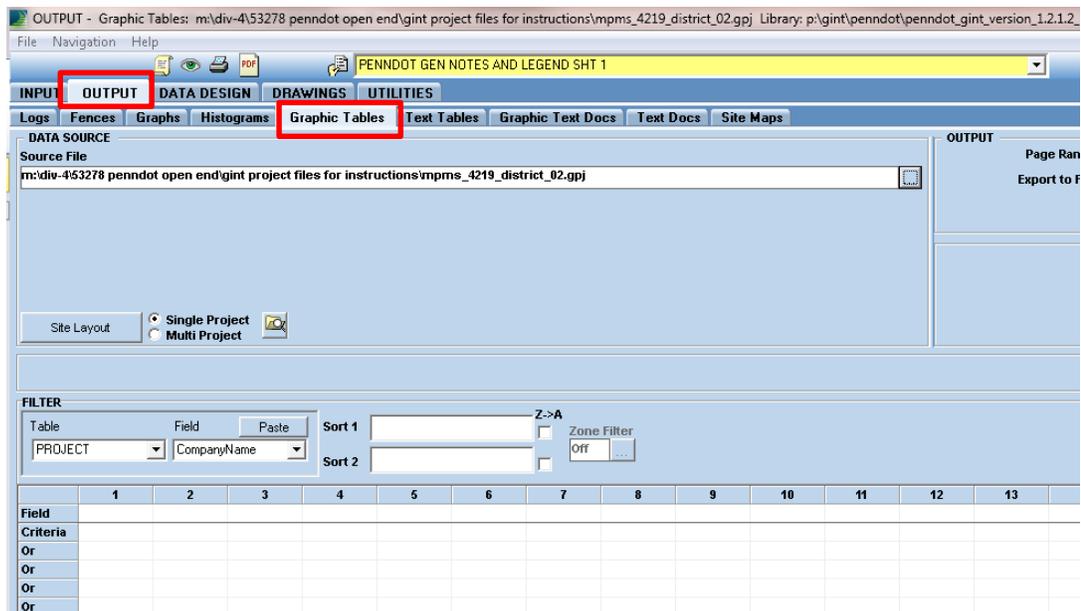
General Notes

General Notes are placed on each page of the structure tracings. However, the format of the notes differs slightly between the first sheet, last sheet, and sheets in between.

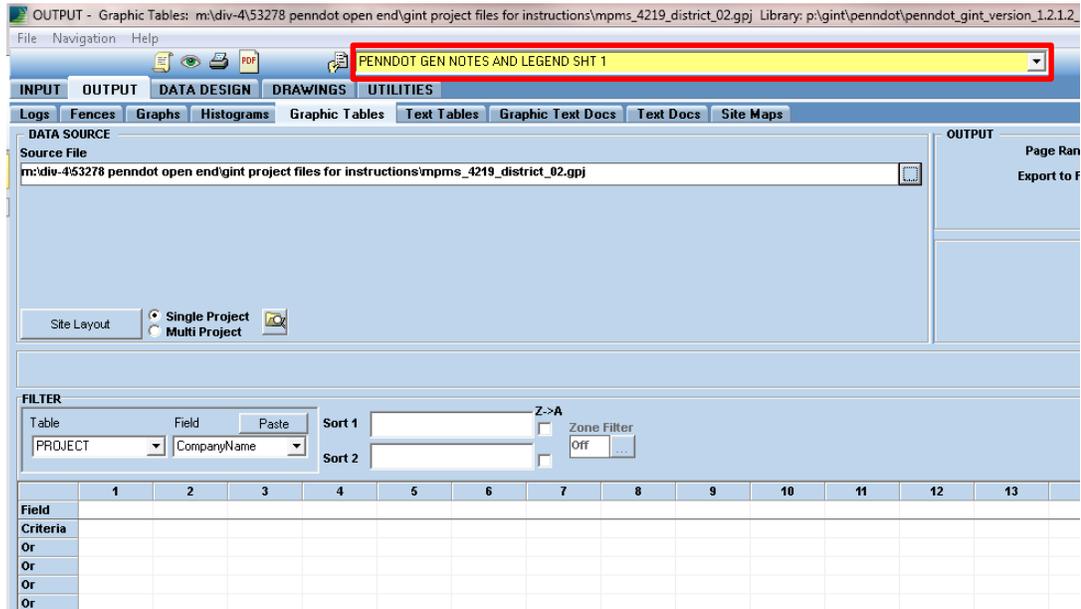
There are three General Notes available to be exported from gINT. There is a note designated for the first sheet of the structure borings, the last sheet of the structure borings, and every sheet in between.

General Notes for Sheet 1

- Under the “Output” tab, click on the “Graphic Tables” tab



- From the drop down menu at the top of the page (bright yellow), select “PENNDOT GEN NOTES AND LEGEND SHT 1”

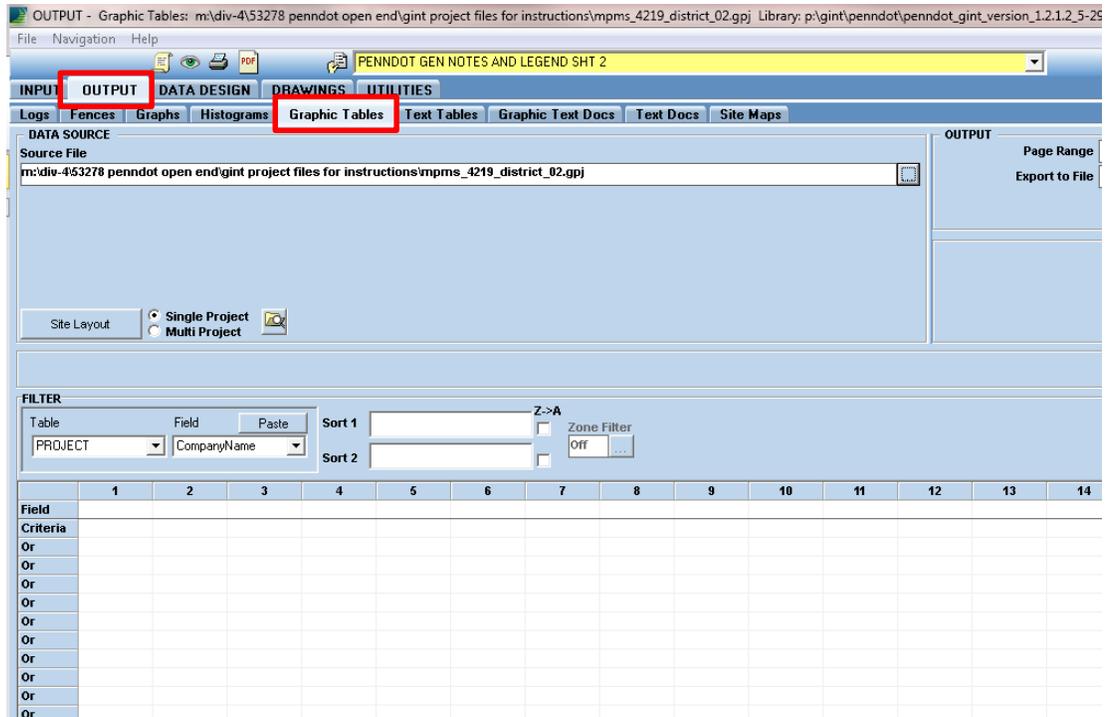


- Under Output: click the square box to the right of the “Export to File” selection box and select the proper location for filing
 - Give the file a representative name (ProjectName_GenNotes1.pdf)
 - Save the file in .pdf format
 - Click “Save”
- Click “Export” to the right of the “Export to File” selection box

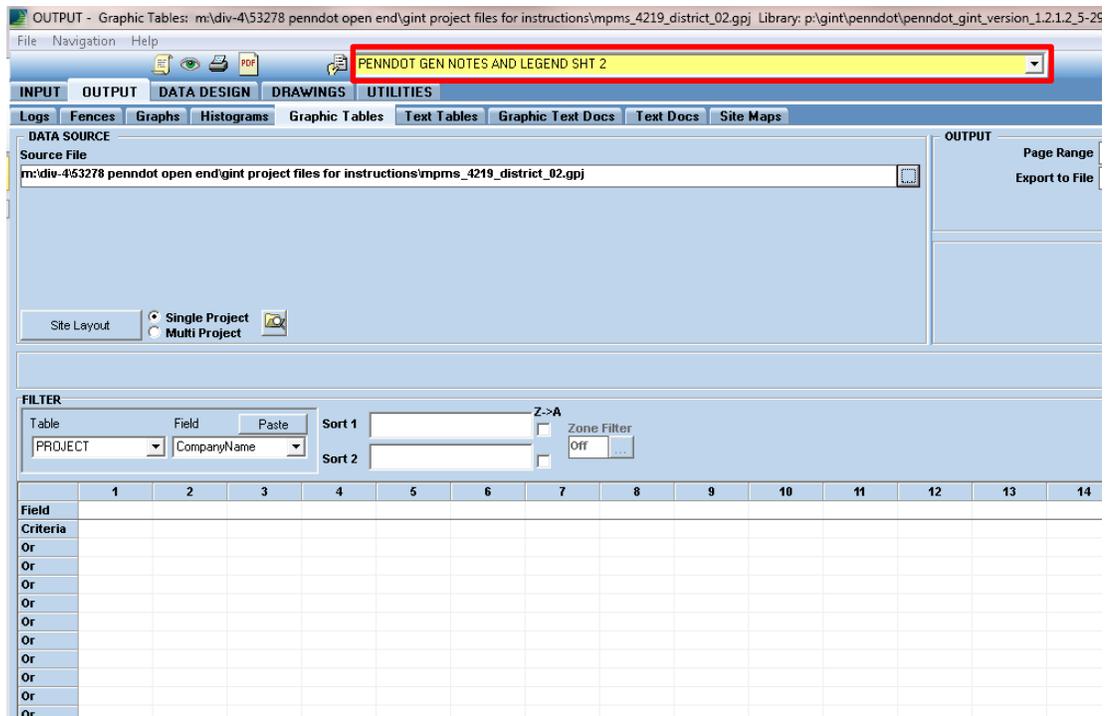
The General Notes and Legend for sheet 1 are now exported into a .pdf file and can be referenced into Microstation

General Notes for Middle Sheets

- Under the “Output” tab, click on the “Graphic Tables” tab



- From the drop down menu at the top of the page (bright yellow), select “PENNDOT GEN NOTES AND LEGEND SHT 2”

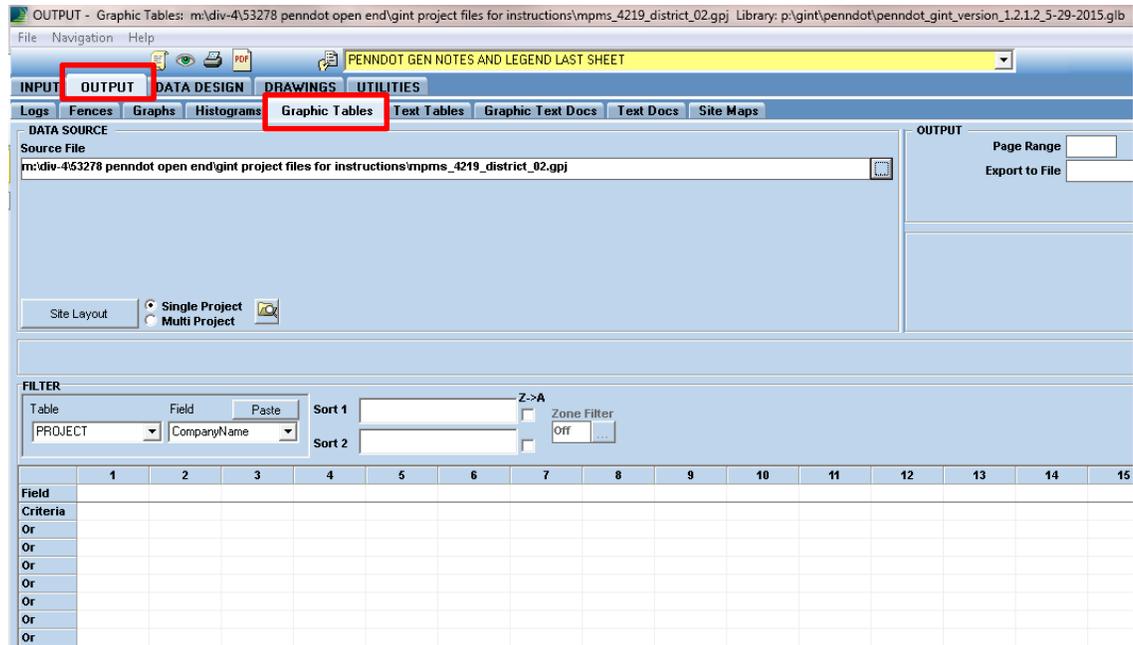


- Under Output: click the square box to the right of the “Export to File” selection box and select the proper location for filing
 - Give the file a representative name (ProjectName_GenNotes2.pdf)

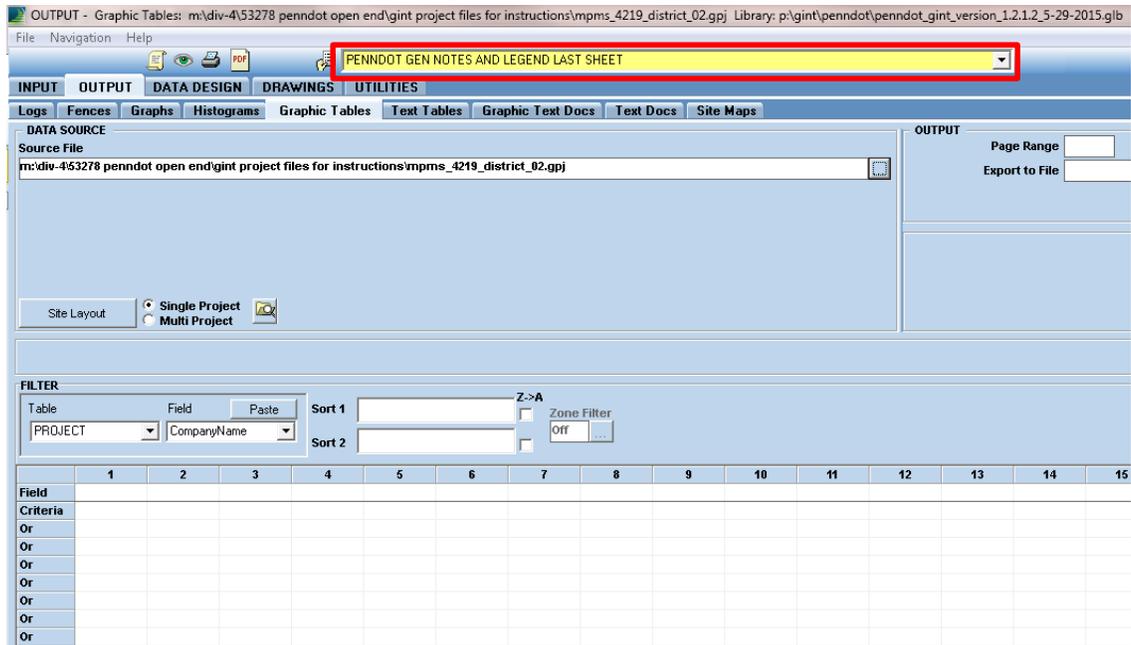
- Save the file in .pdf format
 - Click “Save”
- Click “Export” to the right of the “Export to File” selection box
The General Notes and Legend for the middle sheets are now exported into a .pdf file and can be referenced into Microstation

General Notes for the Last Sheet

- Under the “Output” tab, click on the “Graphic Tables” tab



- From the drop down menu at the top of the page (bright yellow), select “PENNDOT GEN NOTES AND LEGEND LAST SHEET”

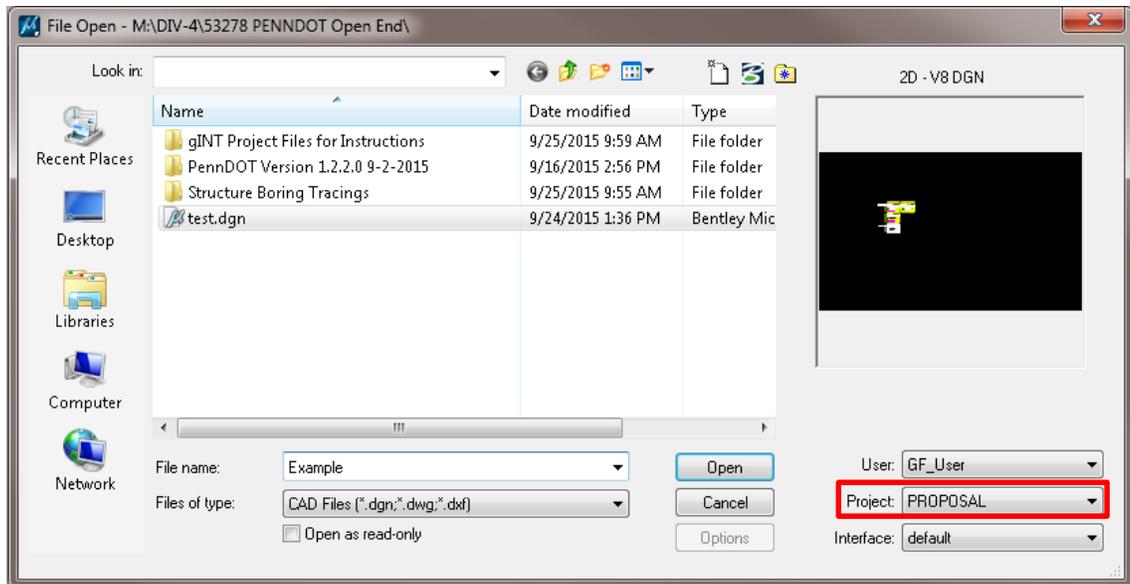


- Under Output: click the square box to the right of the “Export to File” selection box and select the proper location for filing
 - Give the file a representative name (ProjectName_GenNotesLast.pdf)
 - Save the file in .pdf format
 - Click “Save”
- Click “Export” to the right of the “Export to File” selection box

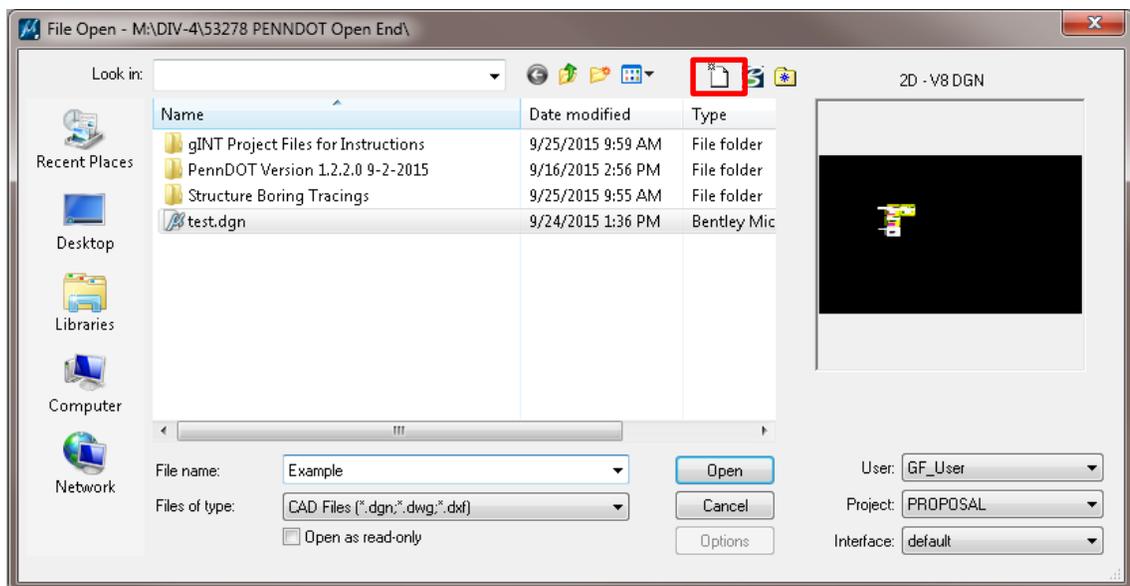
The General Notes and Legend for the last sheet are now exported into a .pdf file and can be referenced into Microstation

Microstation

1. Open Microstation
 - Choose the correct PennDOT project configuration from the bottom right corner

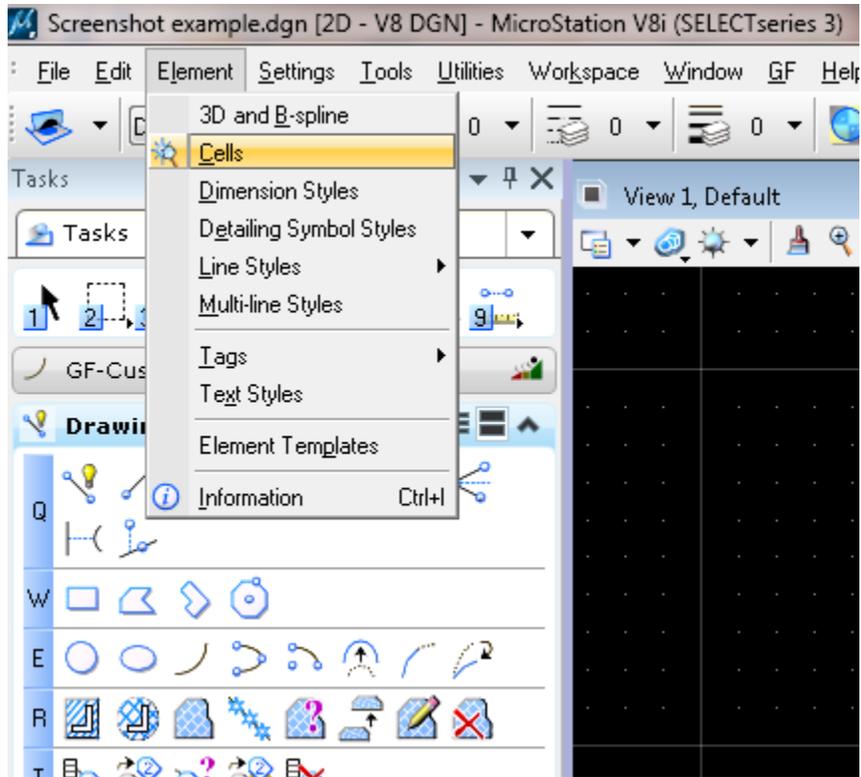


- Click the white page icon to open a new file

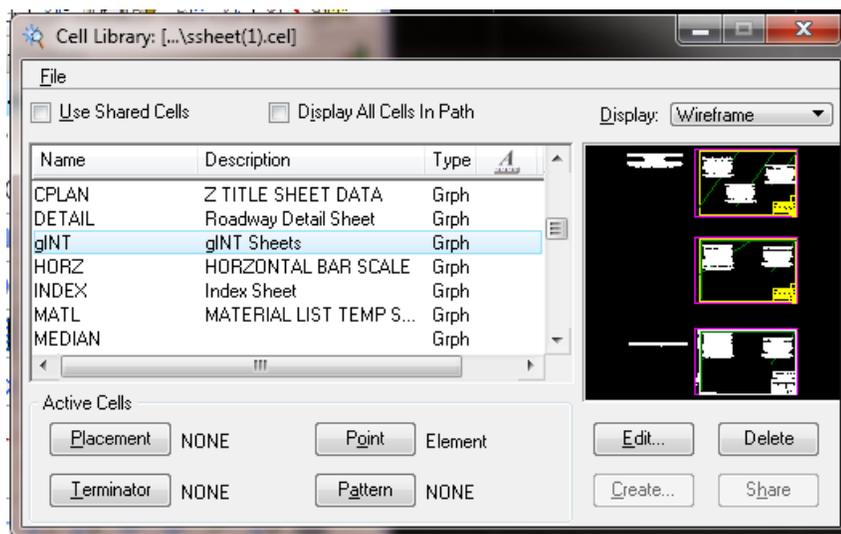


- Give the file a name and save it in the appropriate folder
- Open the file

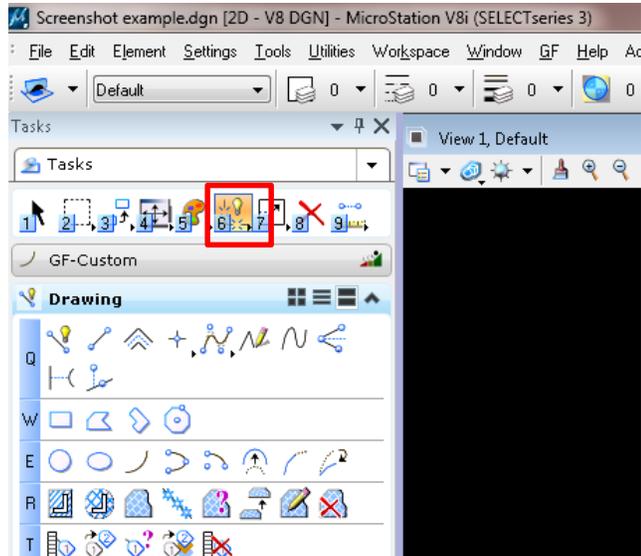
2. Click "Element" at the top of the page and select "Cells" from the drop down menu



- In the Cell Library, click “File”, “Attach File”
- Locate PennDOT’s ssheet.cel files on the local network (Note: Business Partners may obtain a copy of the ssheet.cel file from the CADD Resource Files download facility on PennDOT’s web site. Business Partners need to register to obtain these resource files).
- Open the file ssheet.cel, the Cell Library will now be populated with a list of cells
- Scroll down the list and right click on the cell called “gINT”, select “place” and click anywhere in the Microstation work area to place the cell

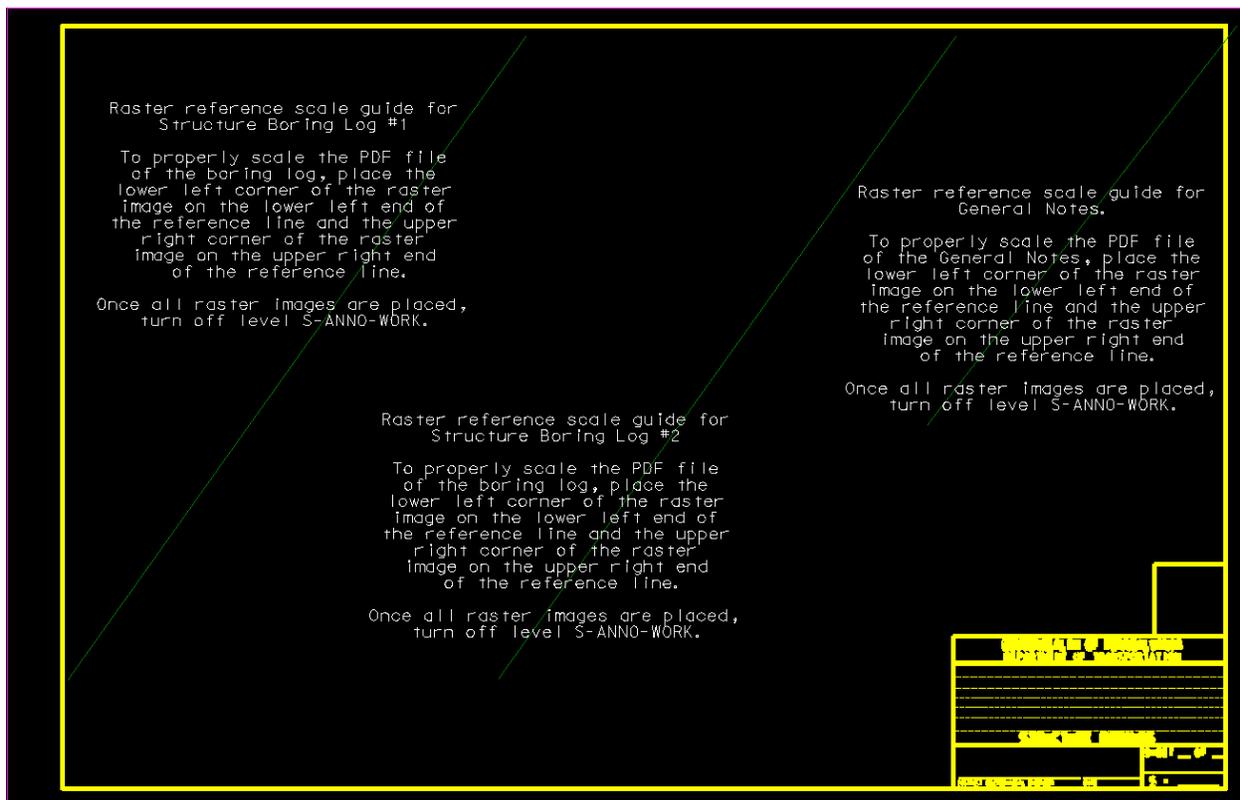


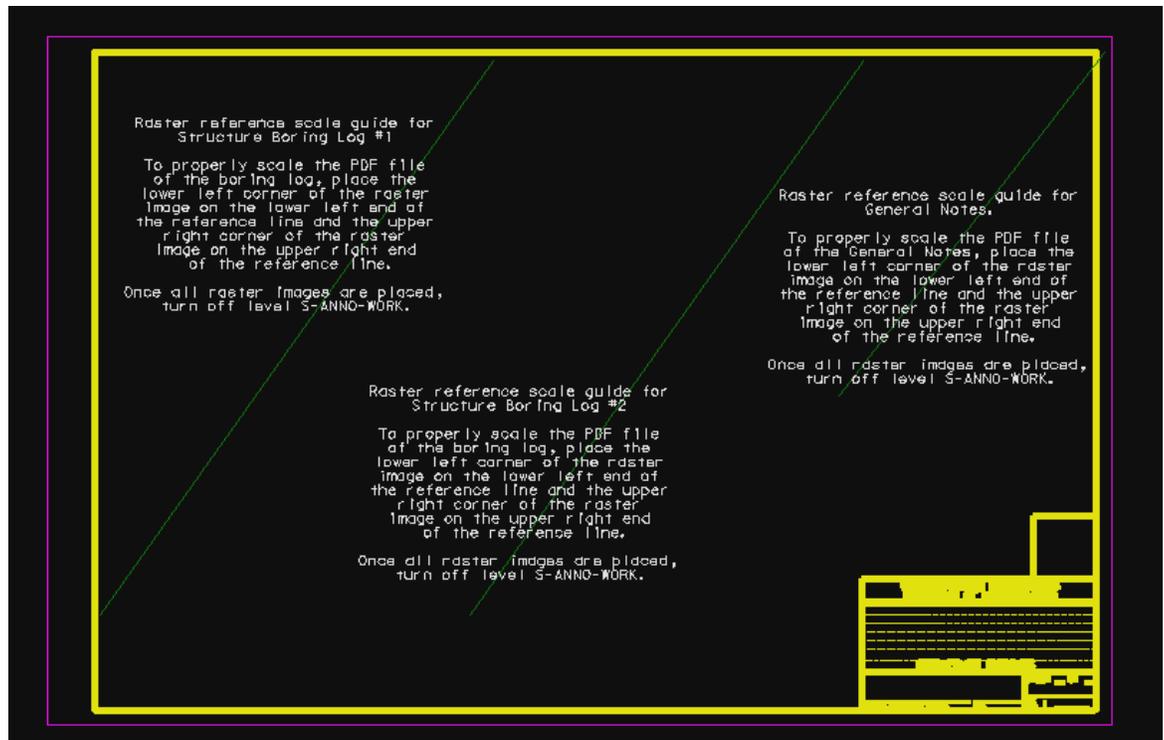
- Close the Cell Library
- Under “Tasks” in the left column, select “Drop Element,” then click on any part of the gINT sheet cell. This tool breaks up complex elements into simpler components for editing



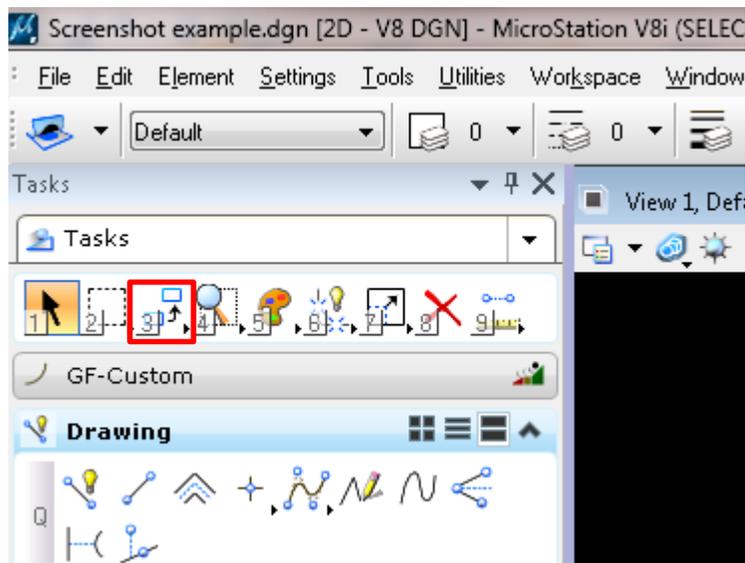
Below are examples of what each sheet looks like in Microstation.

For the Structure Boring Plan and Structure Boring Logs, use:





- Under “Tasks”, select “Copy”



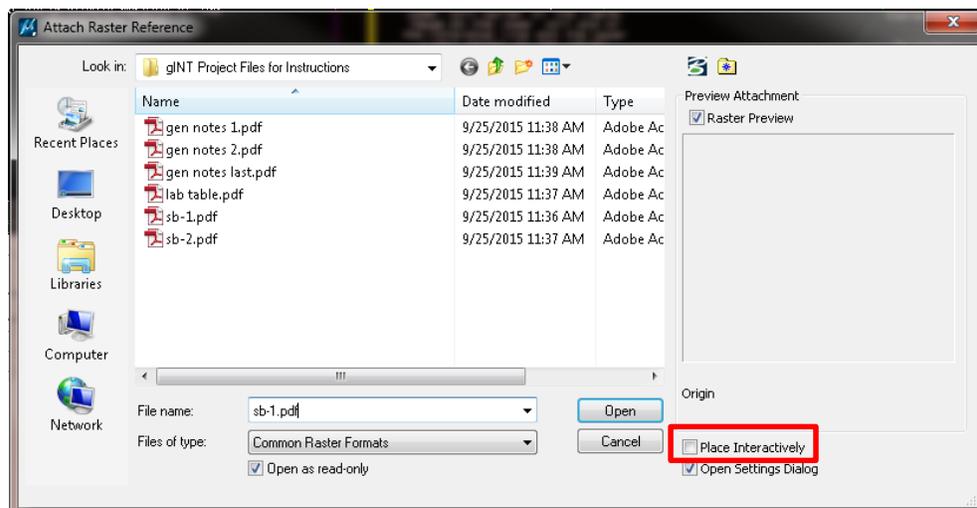
- Click on the border of the sheet that needs copied and place as many copies as needed

4. Reference in gINT PDF files as raster images

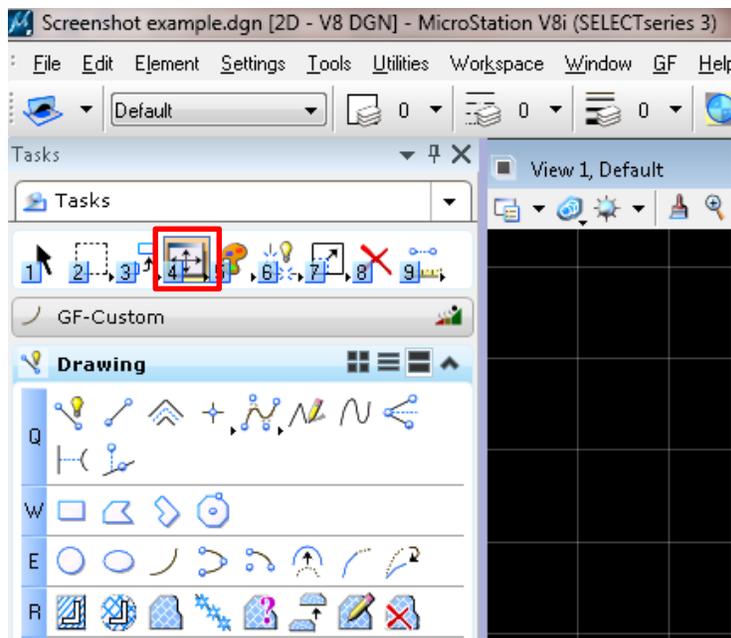
The following steps should be used to import structure borings logs, lab testing tables, and notes. See the screenshot below to determine where each item should be placed within the structure boring sheet. Structure boring logs are placed on the sheets that have three diagonal

green lines. The lab testing table is placed on the sheet that has only two diagonal green lines. The lab testing sheet should always be the last sheet in a set of Structure Borings. (**NOTE:** See Lab Testing Sheet Notes on page 26 of this document for potential exceptions for including lab summaries on the last sheet of the set of Structure Borings.)

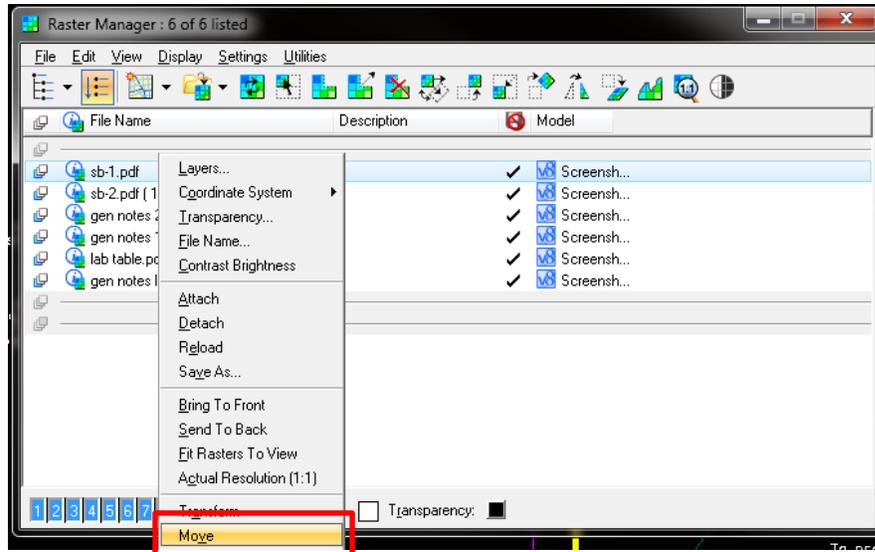
- Click “File”, “Raster Manager”
 - Within the Raster Manager dialogue box, click “File”, “Attach”, “Raster”
 - Select a structure boring PDF that was exported from gINT
 - Ensure that the “Place Interactively” check box is unchecked and click “Open”



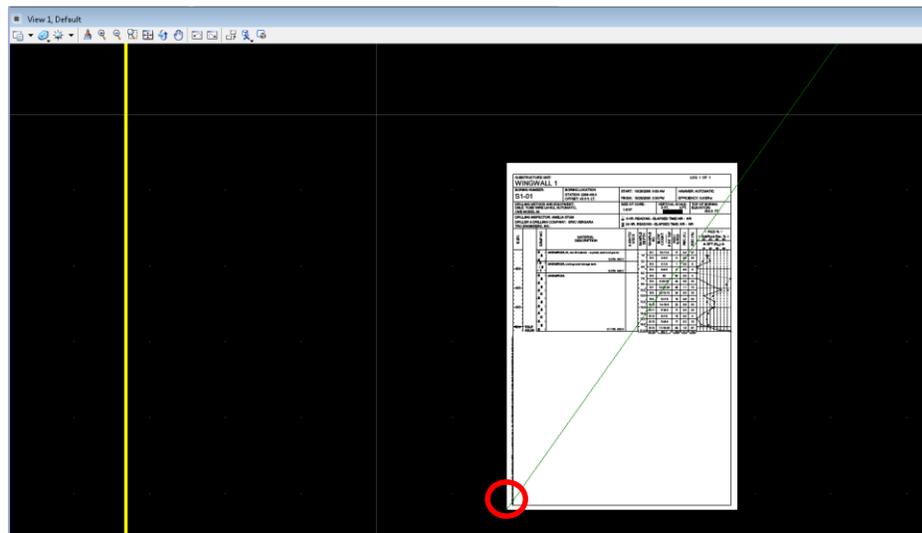
- Click the “Fit View” icon and find where the PDF was imported (typically in the bottom left)



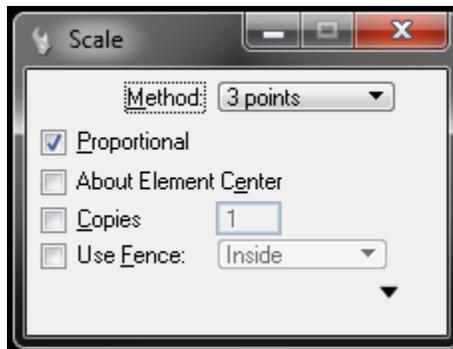
- Open the Raster Manager
 - Select the PDF from the file name list
 - Right-click on the name and select “Move”



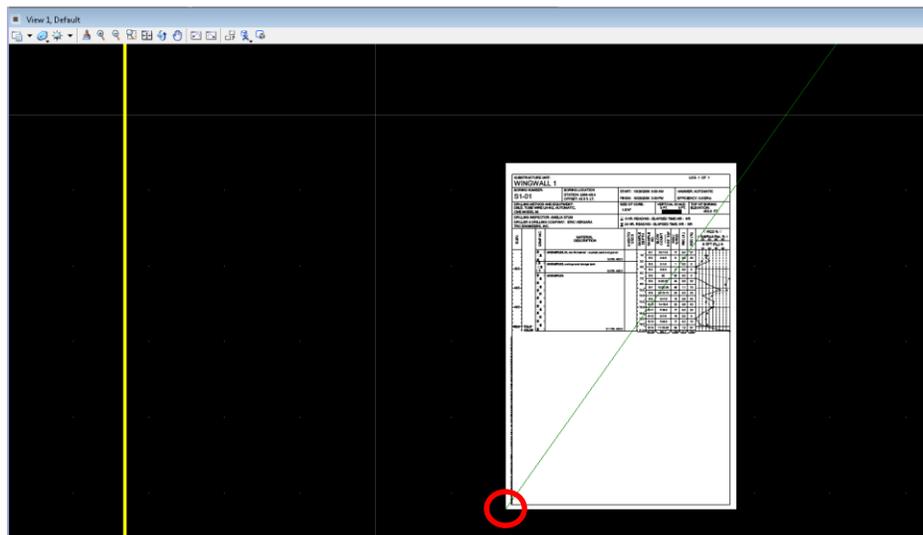
- In the work area, click on the bottom left corner of the PDF and move the image by clicking on the bottom left end of the diagonal green line on the structure boring sheet



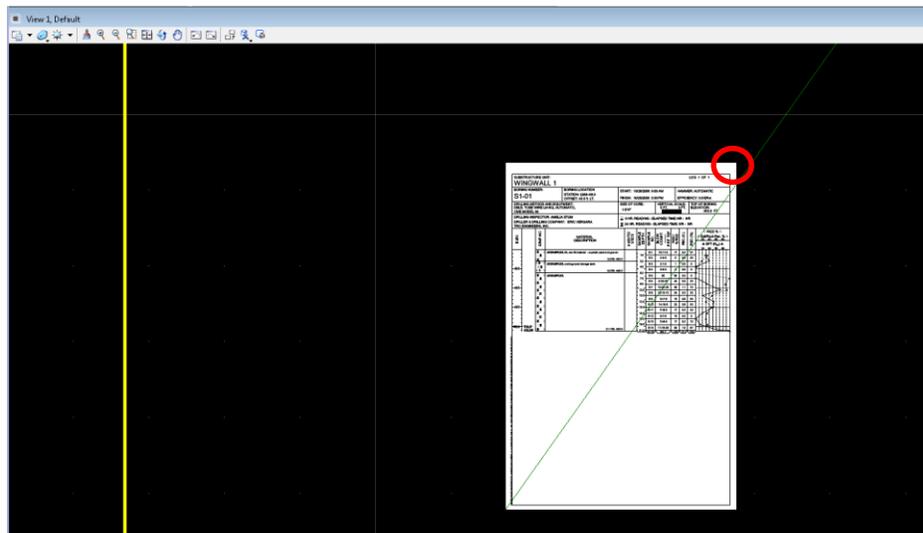
- Return to the Raster Manager
 - Again, right click on the PDF file name and select “Scale”, a “Scale” dialogue box should appear
 - Beside “Method” select “3 points” from the drop down menu
 - Check the box that reads “Proportional”



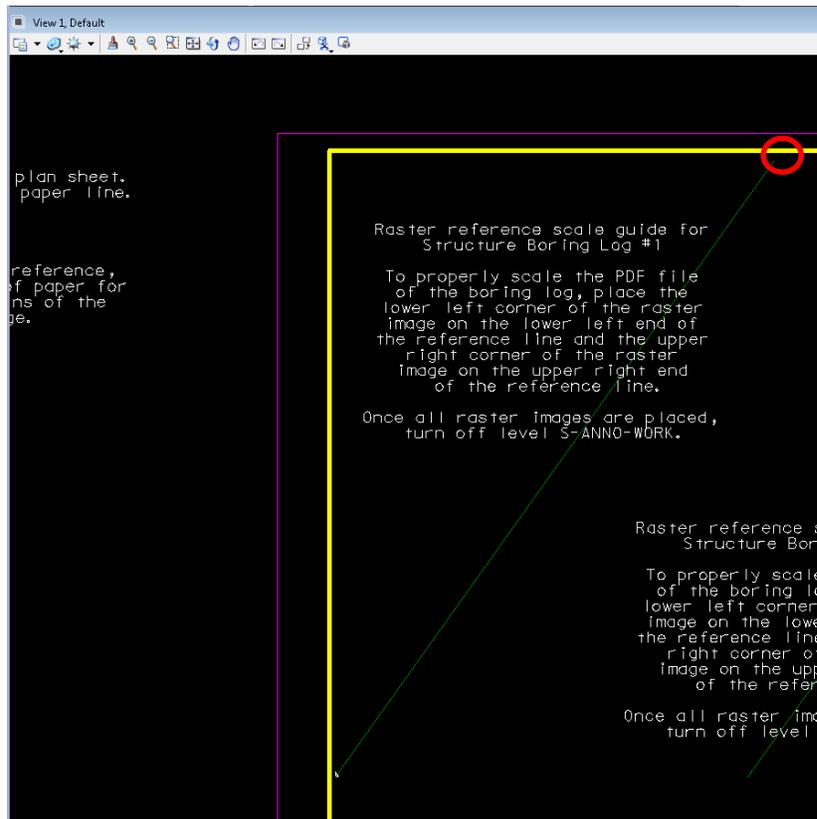
- Click the bottom left corner of the PDF



- Click the top right corner of the PDF



- Click the top right end of the diagonal green line on the structure boring sheet



- Use the instructions within the structure boring sheet for further assistance
- Repeat these steps for the all structure boring logs, lab testing tables, and general notes.

Note: It may look like the PDF runs off of the structure boring sheet; this is not a problem as only the black lines of the PDF show up on the printed version

5. Input the project information in the title block in the bottom right corner of the sheet
 - This information should match structure plans
 - Delete the dotted text alignment lines after the title blocks have been completed

LABORATORY TEST SUMMARY - SOILS																				
BORING NUMBER	STATION	SAMPLE #	TEST DEPTH (FT.)	NATURAL MOISTURE %	% GRAIN SIZE DISTRIBUTION (ASTM)					CLASSIFICATION		PLASTICITY PARAMETERS			SHEAR STRENGTH		TEST METHOD			
					GRAVEL %	SAND %	COARSE SAND %	FINE SAND %	SILT %	CLAY %	USCS	S.G.	LIQUID LIMIT	PLASTIC LIMIT	P.L.	φ (TSF/LOG)		c (TSF/LOG)		
R1-01	228H-020 17A, LT.	S-1 to 5	1.5 to 5.0	4.9	11.6	36.6			52.2	24.0	28.2	A-4	CL	2.66	NP	NP				
R1-03	19+95.8 12.8, RT.	S-5 to 7	6.0 to 9.0	10.1	1.1	28.0			70.9	32.3	38.6	A-6	CL	2.74	29	17	12			
R1-03A	19+97.8 12.8, RT.	S-1	4.0 to 5.0	17.9	10.8	38.1			51.0	25.8	25.2	A-4	CL	30	22	8				
R1-04	11+97.8 9.5, LT.	S-4	4.0 to 5.0	14.2	-6.1	42.2			91.7	30.4	21.3	A-4	CL-M	2.69	21	15	6	0.199	29.0	DR, SHR
R1-05	13+07.8 11.5, RT.	S-1 to 5	1.5 to 5.0	2.5	21.6	38.6			42.4	21.0	21.4	A-4	BC	2.70	23	14	9			
R1-07	2300+070 17.8, RT.	S-7 to 13	9.0 to 19.5	8.4	2.1	34.3			63.6	29.2	34.4	A-6	CL	2.73	33	17	13			
R2-07A	2300+090 17.8, RT.	S-1	15.0 to 17.0	16.6	10.1	32.0			58.0	28.6	28.4	A-6	CL	29	18	11		0.130	28.0	TRAXIAL, CO
R2-11	2304+010 13.8, RT.	S-5 to 10	6.0 to 15.0		11.1	30.5			58.4	23.3	35.1	A-6	CL	2.69	33	21	18	0.130	28.0	TRAXIAL, CO
S1-02	228H-020 28.8, RT.	S-2 to 7	3.0 to 12.0	15.7		25.0			25.0	75.0	35.0	A-0	CL	2.71	28	17	9	0.059	15.6	TRAXIAL, CO
S1-04	228H-020 28.8, LT.	S-1 to 12	1.5 to 19.0	14.1					40.0	60.0	30.0	A-4	BC	2.75	23	15	8	0.045	16.2	DR, SHR
S2-15	228H-020 25.8, LT.	S-5 to 12	6.0 to 18.0	8.3	5.0				20.0	75.0	40.0	A-4	CL	2.73	24	15	9			
S2-26	228H-020 102.4, RT.	S-11 to 15	15.0 to 25.0	14.7	10.0	35.0	5.0	30.0	55.0	25.0	30.0	A-5	SP	2.74	24	15	9	0.079	20.1	DR, SHR
S2-26	228H-020 100.4, RT.	S-16	25.0 to 25.5									A-1-A	GW							

GENERAL NOTES

THIS SHEET IS INCLUDED FOR THE CONVENIENCE OF THE DEPARTMENT. REFER TO PUBLICATION 408 SECTION 102.06 FOR FURTHER INFORMATION.

FOR ADDITIONAL SOIL AND ROCK DESCRIPTIONS SEE PUBLICATION 322.

THE BORING LOGS AND RELATED INFORMATION DEPICT SUBSURFACE CONDITIONS ONLY AT THE SPECIFIC LOCATIONS AND DATES INDICATED. SUBSURFACE CONDITIONS MAY DIFFER FROM THE CONDITIONS REPORTED AT THE SPECIFIC LOCATIONS. ALSO, THE PASSAGE OF TIME MAY RESULT IN A CHANGE OF CONDITIONS AT THE BORING LOCATIONS.

LEGEND

- PP POCKET PENETROMETER
- S-1 SURFING
- BE BOTTOM OF CULVERT ELEVATION
- BFE BOTTOM OF FOOTING ELEVATION
- BSB BOTTOM OF ROCK SOCKET ELEVATION
- BPE BOTTOM OF PILE CAP ELEVATION
- STE ESTIMATED TOP OF ELEVATION
- PGE PROPOSED GROUND ELEVATION
- PTE PILE TOP ELEVATION
- SSE STREAM BED ELEVATION
- TSB TOP OF DRILLED SHANK ELEVATION
- TOLP TOP OF LEVELING PAD
- TOR ESTIMATED TOP OF ROCK ELEVATION
- TORS TOP OF ROCK SOCKET ELEVATION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

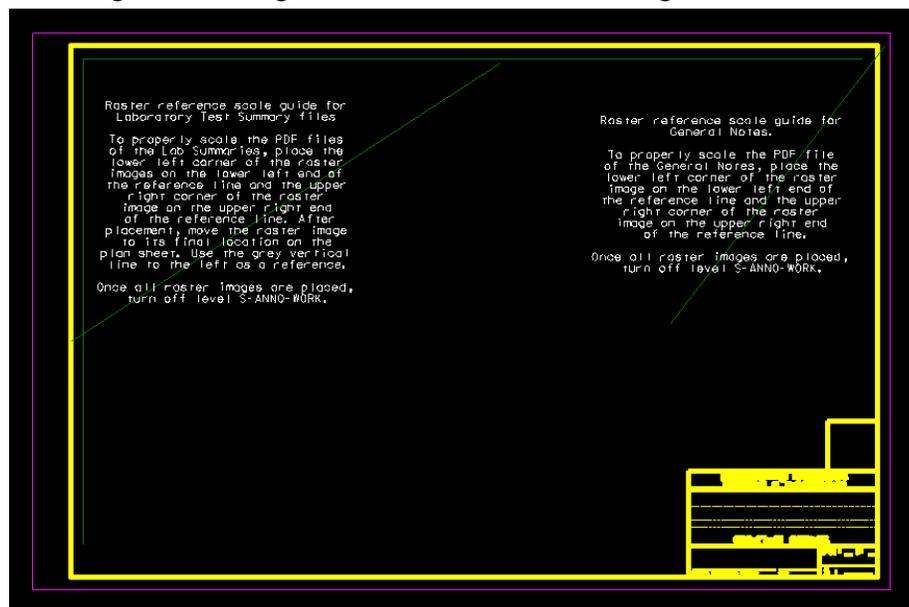
STRUCTURE BORINGS

SHEET OF

DATE -

Lab Testing Sheet Note:

- Lab testing tables may be included on other Structure Boring Sheets including Sheet 1, only if space allows. This will eliminate the need for a separate lab testing sheet at the end of the structure boring set.
- Regardless of which sheet lab testing tables are included on, the tables must be scaled according to the scale guide included on the Lab Testing Sheet shown below.



6. Create Structure Boring Sheet 1

- Reference a plan view of the structure from the latest set of structure plans
- Include the boring locations
- Reference an accurate scale, legend, and core boring data table from the latest set of structure plans
- Scale each item accordingly
- Attach the Sheet 1 General Notes as a raster image and scale accordingly
 - Note: This is the only sheet that receives the Sheet 1 General Notes
- Input the project information in the title block in the bottom right corner of the sheet
 - This information should match structure plans
- See photo below for location of items

GENERAL NOTES

THIS SHEET IS INCLUDED FOR THE CONVENIENCE OF THE DEPARTMENT. REFER TO PUBLICATION 438 SECTION 30.21 FOR FURTHER INFORMATION. FOR ADDITIONAL SOIL AND ROCK DESCRIPTIONS SEE PUBLICATION 232.

THE BORING LOGS AND RELATED INFORMATION DEPICT SUBSURFACE CONDITIONS ONLY AT THE SPECIFIC LOCATIONS AND DATES INDICATED. SUBSURFACE CONDITIONS MAY DIFFER FROM THE CONDITIONS REPORTED AT THE SPECIFIC LOCATIONS. ALSO, THE PASSAGE OF TIME MAY RESULT IN A CHANGE OF CONDITIONS AT THE BORING LOCATIONS.

LEGEND

PP POCKET PENETROMETER
T TORSION
BCE BOTTOM OF CULVERT ELEVATION
BFE BOTTOM OF FOOTING ELEVATION
BRS BOTTOM OF ROCK SOCKET ELEVATION
BSCC BOTTOM OF PILE CAP ELEVATION
EPTE ESTIMATED PILE TIP ELEVATION
PGE PROPOSED GROUND ELEVATION
PTE PILE TIP ELEVATION
SSE STREAM BED ELEVATION
TOSB TOP OF STREAM BED ELEVATION
TOSR TOP OF ROCK ELEVATION
TORS ESTIMATED TOP OF ROCK ELEVATION
TORSR TOP OF ROCK SOCKET ELEVATION

THE DESCRIPTIONS OF THE MATERIALS HAVE BEEN VERIFIED.

THE SUBSURFACE EXPLORATION DATA THAT ARE PRESENTED ON THESE DRAWINGS INCLUDING BORING LOGS, EARTH SAMPLES, ROCK CORES, CLASSIFICATION OF MATERIALS AND DEPTH OF BORING(S) ACCURATELY REPRESENT THE CONDITIONS ENCOUNTERED BY THE TEST BORING PROGRAM AT EACH BORING LOCATION.

GEOTECHNICAL ENGINEER/ENGINEERING GEOLOGIST DATE

NO.	STATION	OFFSET	SURFACE ELEVATION

LEGEND:

⊕ - LOCATION OF CORE BORING

Work	Description	By	Checked	Reviewed	Date
REVISIONS					

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

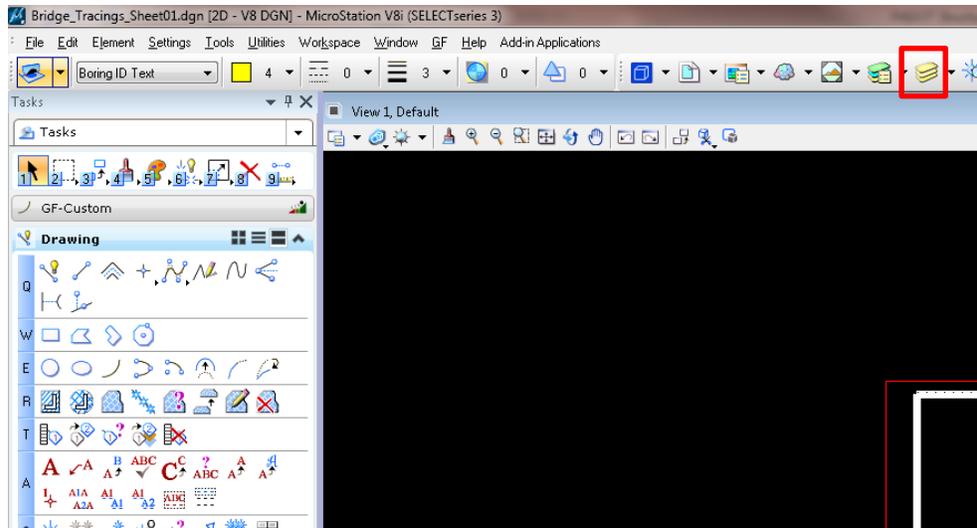
STRUCTURE BORINGS

SHEET ___ OF ___

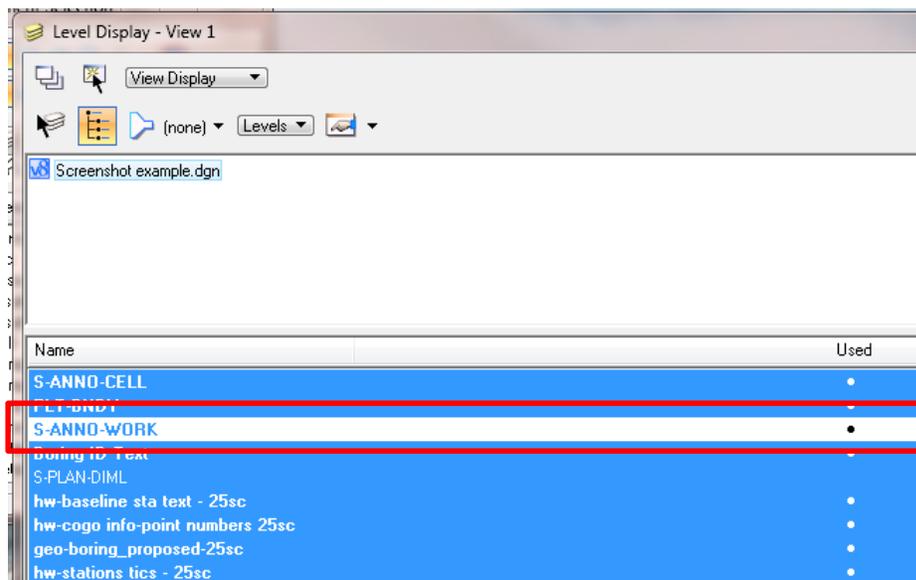
DATE: _____ S - _____

7. Print Structure Tracing Sheets (Each sheet will need to be printed separately)

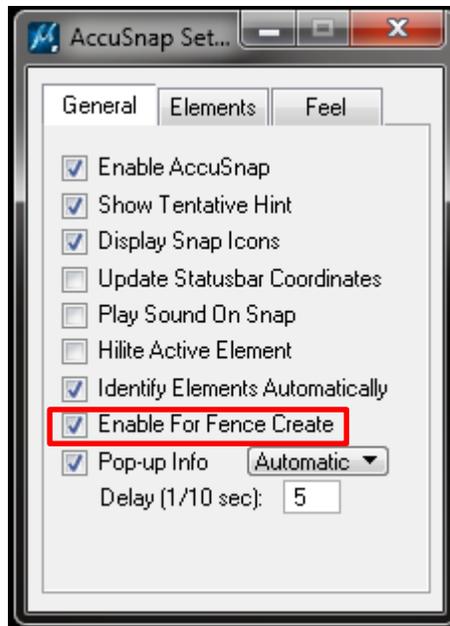
- Turn off the "S-ANNO-WORK" level
 - Open "Level Display"



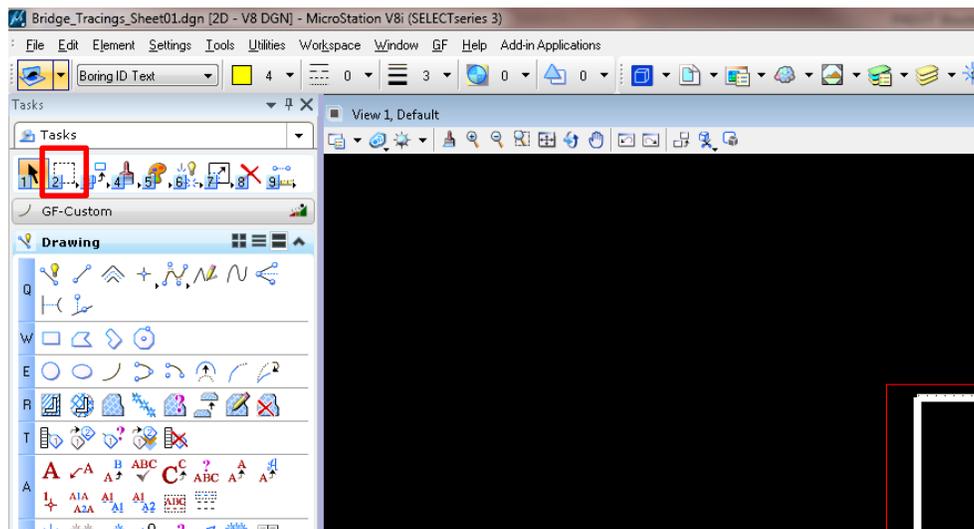
- From list of levels, click on “S-ANNO-WORK” to turn off



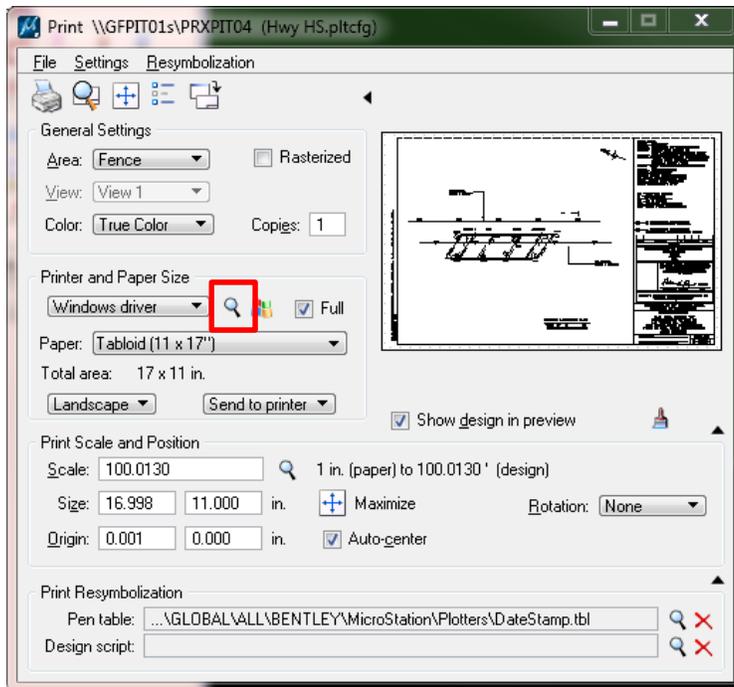
- Click “Settings”, “Snaps”, “AccuSnap”
 - Check the box next to “Enable For Fence Create”



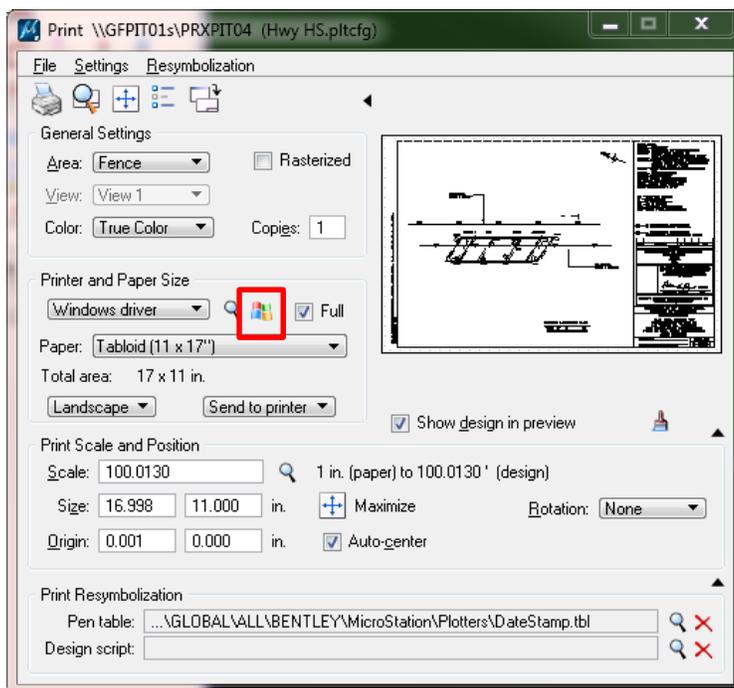
- Close AccuSnap
- Select the “Fence” feature (Under “Tasks” the square icon with a number 2)



- Use the pink outer border of each sheet as a guide to set the fence
 - Start the fence by clicking on the bottom left corner of the pink border
 - Complete the fence by clicking the top right corner of the pink border
- Click “File” “Print”
- Under Printer and Paper Size select the appropriate printer driver configuration file



- Click the Microsoft Windows icon under “Printer and Paper Size” to select the appropriate printer



- Structure Borings are to be printed to 22”x34” plan sheets. Business Partners are responsible for ensuring that the final plot of Structure Boring sheets are scaled correctly.
- Click the printer icon in the top left corner of the dialogue box to print