Setting up the OpenRoads Designer File for Pipe Design

These instructions were created February 2024. These instructions were created with:



OpenRoads Designer CE - 2022 Release 3 Update 12 Version 10.12.02.4 This product is licensed to:

The first step to a pipe design, is to create the OpenRoads Designer files that are needed. In ProjectWise, use the Copy Seed tool. Navigate to the correct project directory for the project. In the Bridge folder right click on the folder and select the Copy Seed command.

1703503004	/ / / / / / D IV	1_//055245_t
T703503008	New Folder	5_E
· 25 7703503012	New Work Area	6_1
7703503013	0.000	5_1
7703503016	Open	5_[
# 2703503019	Open in New Window	4_2
7703504015	Copy Out	503
🖨 💯 Bridge	Purge Copies	9_D
🔰 🕀 💯 BRFinal 🗸		
🗄 💯 BRPreli	Purge Workspace	
🕀 💟 Design	Export	df
Project	Revert to Folder	
⊕ ∰ Saved S ⊕ ∭ Concept	Create Renditions	
Concept	Export Dependency Map(s)	
Design		
DistrictDes	Import Dependency Map(s)	
DistrictRCE	Cut	E E
🕀 💯 DistrictROV	Сору	W
🕀 💯 DistrictSun	Paste	1
🕀 💯 Geo		
🕀 💯 OLE	Rename	Pr
🕀 💯 Photo	Delete	Na
🗄 💯 PreDesign	Advanced Search	Fil
🕀 📴 PrelimSurv	Scan References and Link Sets	Fil
🕀 💯 ProjectMar		Fil
press F1	Properties	
	Copy Seed	
્રાજી, તેવે, તેવુ, તેવુ, જ્યુ, તેવુ, તેવુ, તેવુ		261

The Copy Seed utility will open.

Copy Seed v .08			×
File Suffix:	eate: Projects\7703504015\Bridge	Name of file to create (CCRRRPPP) : C=County, R=Route, P=Parenthesis	
Choose file type:	ORD PIPE CULVERTS Seed		✓ Create File
Extension of file to (create : dgn	Scale of file to create : Z08 \checkmark	Exit

Next, name the file. For pipes, the naming convention for the file is ORD_CCRRRPPP_DOT_PIPE_CULVERTS_SPN

where

<u>ORD</u> = the application the work is done in <u>CC</u> = County <u>RRR</u> = Route <u>PPP</u> = Parenthesis <u>DOT</u> = company and or source of the file <u>PIPE_CULVERTS</u> = type of work <u>SPN</u> = coordinate projection of this project.

For this example, the file will be ORD_8075057_DOT_PIPE_CULVERTS_Z01.dgn. Please refer to the <u>Seed</u> <u>File</u> document on Iowa Department of Transportation Bridge Connect Documentation page for further instructions on naming the files.

Next select the correct file type. For this work, choose the ORD PIPE CULVERTS Seed.

Copy Seed v 10.0.0.0		·	×
File Suffix:	Name of file to create (CCRRRPPP) : C=County, R=Route, P=Parenthesis		
Location of file to crea	ate: Projects\3600202024\Bridge		
Choose file type:	v	Create File	1
	ORD 2D Seed ORD 3D Seed ORD Title Sheet (A)		
Extension of file to cru	ORD Detail Sheet Seed (B, J, U) ORD Legend Sheet Seed ORD Mitigation Design Sheet Seed	Exit	
	ORD Template library ORD STRUCTURES OVER VIEW Seed ORD PIPE CULVERTS Seed		
	ORD STRUCTURES Seed OBM 3D Seed		
	ORD Prelim Bridge Design Seed Bridge Plan Production Seed Master Common Details	rty value	
	M Sheet Stormsewer Calc File (*.xlsm) T Sheet Earthwork Calc File (*.xlsm) C Sheet Bridge Approach Calc File (*.xlsx)	,21018142_DOT_PIPE	_CUL
	Project Documentation File (*.xlsm)	02	

Then select the correct coordinate projection for the file. For this example, select Z08 for IaRCS Zone 08.

Copy Seed v 10.0.0.0			×
File Suffix:		Name of file to create (CCRRRPPP) : C=County, R=Route, P=Parenthesis	3075057_DOT_PIPE_CULVERTS_Z01
Choose file type:	ORD PIPE CULVERTS Seed		✓ Create File
Extension of file to (create : dgn Scale of file to create	e: Z01 ~ Z02 ^ Z03 Z04	Exit
Work Area Prop	Personal Portal Dependency Viewer Access Control	Z05	er l
Properties	(Work Area Type - IDOT_Bridge_Project_Number)	Z08	
BRG_PIN_N		Z09 Z10	
BRG_PROJ_	•	Z11	
BRG_PROJ_	•	Z12 Z13	
BRG_TYPE_	OF_PLANS	Z14	
IA_GROUP		UD CONNECT	
BRG_FILE_N		SPN SPS	
	M_ENGINEER	Z01	
BRG_FINAL		Z02 Z03	
BRG_DESIG	-	Z03	
BRG_STATU		Z05	
BRG_STATIC	ON_NUMBER	206	

Once everything is set, click on the Create File button.

Copy Seed v 10.0.0.0			×
File Suffix:		Name of file to create (CCRRRPPP) : C=County, R=Route, P=Parenthesis	3075057_DOT_PIPE_CULVERTS_Z01
Location of file to cr	eate: Projects\8407501017\Bridge		
Choose file type:	ORD PIPE CULVERTS Seed		Create File
Extension of file to	create : dgn	Scale of file to create : Z01 V	Exit

This creates the correct dgn file in the project directory.

y Seed v .08				
ile Suffix:		Name of file to create (C=County, R=Route, F		S_Z08
ocation of file to create	: Projects\7703504015\Bridge			
hoose file type: 0	CopySeed	×	Create	e File
	New docume	Created successfully.		
xtension of file to creat	te :	208 ~	Exi	ít

A message saying New document created successfully displays. Click OK button on the message.

Then, click on the Exit button to close the Copy Seed tool.

Once the file is created, open it in the project directory. To do this, select the file, then right click and select Open with...

		New	
		Open	
		Open as Read-Only	
		Open With 🧹	
-		Markup	
ProjectWise Explorer CONNECT Edition		PDF Markup	
D <u>a</u> tasource <u>F</u> older <u>D</u> ocument <u>V</u> iew <u>T</u> ools <u>W</u> indow <u>H</u> elp		View	
। 🞦 😪 🕾 । 🚘 । 🕒 º₂ 🖫 📰 📰 । 🎯 🖕 i 🖓 🗸 Search 🕎	<u>;</u>	Get Link	
🕴 💠 👻 🚽 🚺 🚽 Address 🏹 pw:\\NTPwint1.dot.int.lan:PWMa	iin\Documents\Projects\84075	Check Out	Ŧ
₩	🗄 List 🕒 Spatial	Check In	
₩ 2406001014	Name	Free	Description
a406001019	Enter text here	Copy Out	T Enter text here
B406001020 B-125 8406001021	257)_B02 Pipe work		
₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩	20 BRPrelim	Export	
₩	🖉 💟 Design Events	Import	
· · · · · · · · · · · · · · · · · · ·	NojectResources	Create Renditions	
·	2 17-84-075-010_STRU	Export Dependency Map(s)	STRUCTURES OVERVIE
·	2 🔂 ORD_8075057_DOT_P	Import Dependency Map(s)	Pipe Model file
₩ 2407501010		import Dependency Map(s)	-
· · · · · · · · · · · · · · · · · · ·	T	Update Server Copy	
iani and a state		Refresh Local Copy	
iandia and a bridge and a brid		Purge Local Copy	
(37)_B02 Pipe work	<	Purge WorkSpace	

Select the OpenRoads Designer CONNECT Edition program. Then click on OK.

Open document with			
t			
ogram			
Name	Description	Application	Enab
OpenRoads Designer CE 2022 Release 3	Bentley MicroStation Design	"C:\Program Files\Bentley\OpenRoads Designer CE 10.12\OpenRoadsDesigner\OpenRoadsDesigner.exe" "%1" -ws_PWEXPLORER=1 "-wsPWDIR=C:/PROGRA~1/Bentley/PROJEC~1/"	No
¢			
Always use this program			Browse
Open document as read-only			
ick here for a list of suggested document viewers			

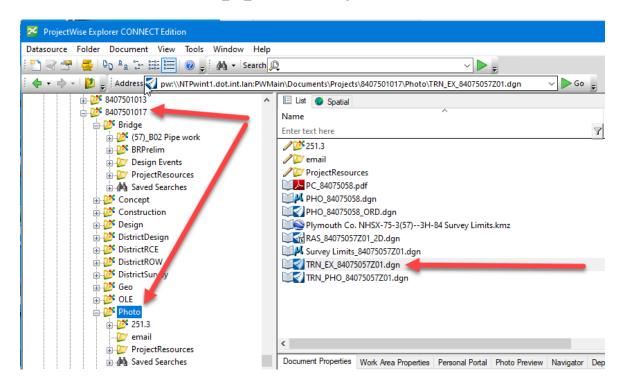
Now that the file is open, set the file up to allow the use of the muti-model workflow and make a 3D cut of the proposed corridor.

🗇 Mode	ls		– 🗆 X
	0 🚰 🗐 🍞 🗙		
Туре	2D/3D Name	Description	🔆 Cell Type
	PIPES	Road Pipes	✓ Graphic
	🗍 STR info	Pipe and Culvert info 3D	✓ Parametric
<			>

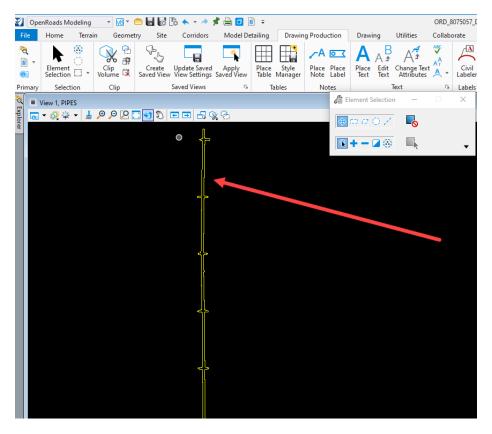
Next, use the existing ground TRN file to create the 3D managed model. Reference in the existing ground TRN file to the PIPES 2D model in the file that was just created.

In ORD when 3D information is leveraged in a 2D file it will automatically create the 3D managed model.

For this example, reference in the TRN file from the survey or Photo location. For this example, it is in the Photo folder and is called TRN_EX_84075057Z01.dgn.

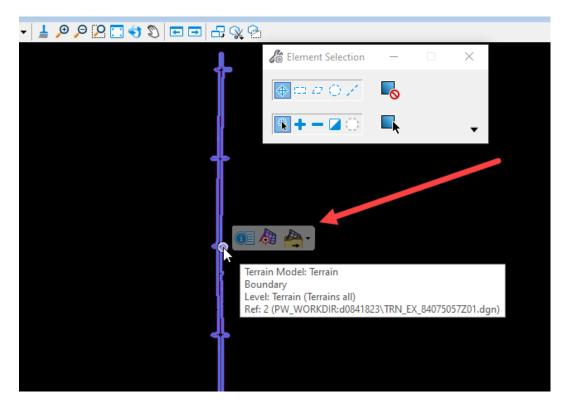


The content of the file should look like this:

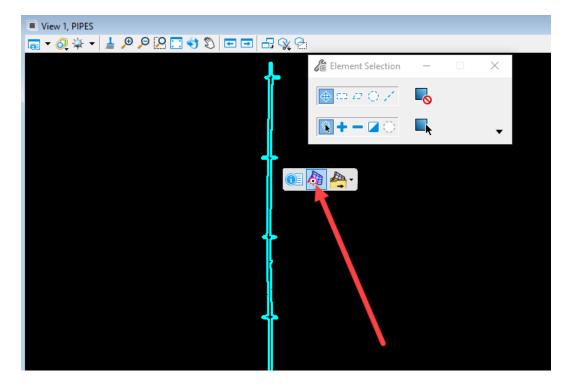


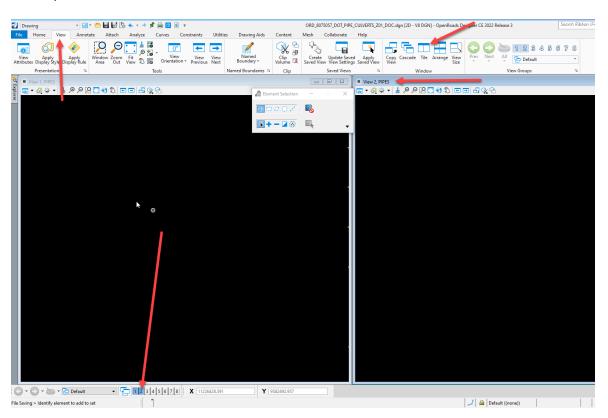
Next, using the Element Selection tool select the boundary of the TRN file.

It should turn blue. Then hover over it to activate the heads-up toolbox.



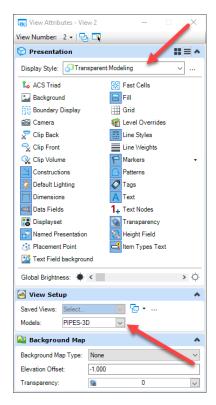
Select the middle tool, Set As Active Terrain Model. Once selected, it will change the icon.





Next, open a second view window. Then select the Tile windows tool in the Window ribbon.

Open the View Attributes tool in view 2. Select the PIPES-3D model in the View Setup section of the View Attributes tool.

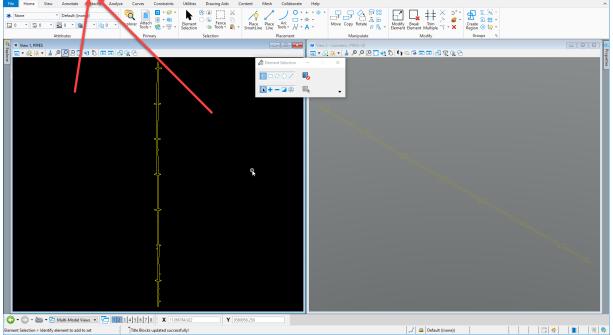


Note: It is preferred to change the Display Style in this view to Transparent Modeling to make it obvious when working in 2D or 3D.

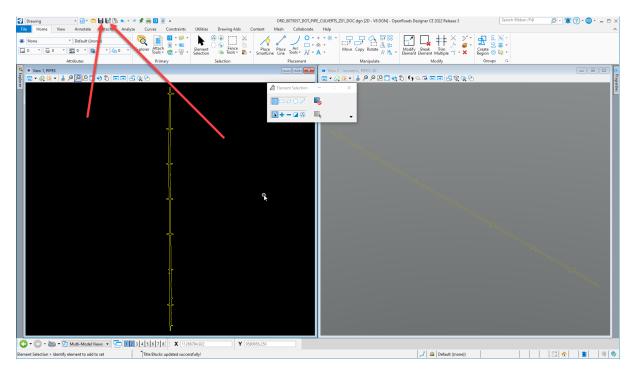
Ø•**\$**?•**®**• = □>

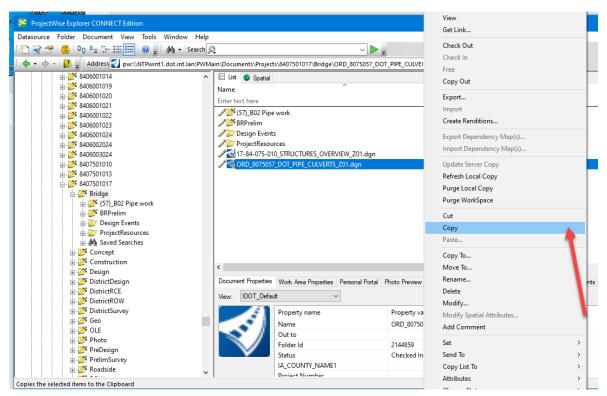
🛃 Di · • • 5057_DOT_PIPE_CULVERTS_Z01_DOG Collaborate 0 * + * **•** Element Selection Image: Second se Place Place Arc SmartLine Line Tools + W + A + Move Copy Rotate ত্ 0 🖬 * 🗟 0 - 30 - S Attribu

The content of the file should look like this:



Save the file and save the settings so that the next time the file is opened it will be set to these view settings.





Next, close the file and check it into ProjectWise. Then, select this file and right click to select Copy.

Paste the copied file in the parenthesis folder for making sheets. Rename the file to SHT_8075057_DOT_PIPE_CULVERTS_Z01.dgn. Please refer to the <u>Seed File</u> document on Iowa Department of Transportation Bridge Connect Documentation page for further instructions on naming the files.

ProjectWise Explorer CONNECT Edition			
Datasource Folder Document View Tools Window Help	,		
🞦 😪 😁 🚑 🗣 🛌 🏣 📰 📰 🎯 🥃 🚜 🗸 Search	Q		
🕴 💠 👻 🚽 🚺 🖕 🗄 Address 🏹 pw:\\NTPwint1.dot.int.lan:PWM	/lain\Documents\Projects\8407501017\Bridge\(57)_B02 Pipe work		
8406001014	🗄 List 💿 Spatial		
a 2406001019	Name	Descriptio	n
	Enter text here	T Enter text	here
B 25 8406001021	✓ [Paren]_Standards		
⊕ <u>2</u> 8406001022 ⊕ <u>2</u> 8406001023	CC-RRRS-PPP Review		
8406001023	CC-RRRS-PPP_Shop Drawings		
8406001024	/ DOT		
8406003024	ProjectResources		
B407501010	Sketches		
± 28407501013	XYZ-CORP		
8407501017	SHT_8075057_DOT_PIPE_CULVERTS_Z01.dgn	Pipe x sect	tions
🔄 💯 Bridge			
⊕ 💯 (57)_B02 Pipe work			
BRPrelim			
🖶 💯 Design Events			
ProjectResources			
🔬 🖗 Saved Searches			
Construction	<		
DistrictDesign	Document Properties Work Area Properties Personal Portal	Photo Preview Navigator Dependency Vie	wer Access Control Components
⊕-	View: IDOT_Default ~		
			-
ia-ias Geo	Property name	Property value	Property name
and a set of the set	Name	SHT_8075057_DOT_PIPE_CULVERTS	Description
Photo	Out to		File Updated
Hills	Folder Id	2144905	File Size
PreimSurvey	Status	Checked In	File Updated By
Roadside 🗸	IA_COUNTY_NAME1		IA_PIN_NUM
I I I I I T ™ ▼	Droject Number		Doc Tree
1 object(s) selected			

Next, open the SHT file. Then, detach the TRN file reference.

🕜 🖽 😂 🔿 🦯	0			- • ×
Tools <u>P</u> roperties				
🗄 🛨 陰 🔌 👌 🎉 🧇 🧽 🖻 🖓 🏠 🖏 🖓 🎒 🙀 🖓 🖉 Hilite Mode: 🛙	Boundaries 🔻			
Slot 🏴 🛅 File Name Model 🥒	Description L	ogical Orientation	Presentation	/isible Edges [
3 V SHT_8075057_DOT_PIPE_CULVERTS_Z01_DOC.dgn PIPES-3D		Ref Coincident - World	Wireframe [Dynamic
2 PW_WORKDIR:d0841823\TRN_EX_84075057Z01.dgn Default	<u>A</u> ttach	Coincident - World	Wireframe [Dynamic
1	Detach Reload Exchange Open in New Sission Activate	Coincident - World	Wireframe [Dynamic
<	Deactivate			>
Scale 1.00000000 : 1.00000000 Rotation 00*00*00" Offset X 0.0 Image: Config Variable Image: Config Varia	<u>M</u> ove <u>C</u> opy <u>S</u> cale <u>R</u> otate Merge Into Master	0 ay Overrides: Allow 🔻	_	

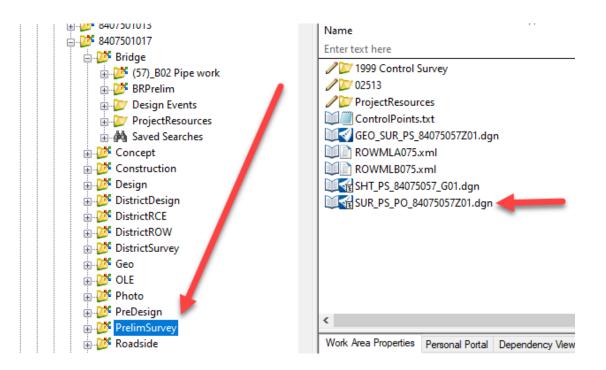
Then attach the model file ORD_CCRRRPPP_DOT_PIPE_CULVERTS_Z01.dgn from under the Bridge folder using live Nesting Depth of 2.

						* +	- 🛛	0	k		•						
📄 Ref	ferences (19 of 19	unique	, 19 displ	ayed)												
<u>T</u> ools	<u>P</u> ropert	ies															
. •	詮 Ş	k 🛅	1 1		2	<u>}</u>)]	7 6 d	i 📴 🥡) 🗙	<u>H</u> ilite	Mode:	Boundaries	•			
Slot	۳ 🗅	File N	lame					Model				Descr	ription	Logical	Orientation		Presentat
3	~	SHT_	8075057	DOT_PIP	E_CUL	ERTS_Z	01	PIPES-3D						Ref	Coincident -	World	Wirefram
2		\OF	RD_80750	057_DOT	PIPE_C	ULVERT.		PIPES 📑				Road	Pipes		Coincident -	World	Wirefram
1	\sim	SHT_	8075057	DOT_PIP	E_CUL	/ERTS_Z	01	STR info				Pipe a	and Culvert inf	f	Coincident -	World	Wirefram
<																	
	1.000000	000		1.0		20		Detection	- 0080010	0"	0		0.000		V 0.000		
Scale	1.000000	000	_	: 1.0	0000000			Kotatio	n 00°00'0	0	0	set <u>X</u>	0.000		<u>Y</u> 0.000		
• -	2 🕨 🔁	1:1	<i>7</i> 9	: 🏭 🗞	90] 📥 🧖	۱ <u>۳</u>	ested Att	achments:	Live N	lesting		 Nesting D 	e <u>p</u> th: 1	Display Overrid	es: Allo	w -
Ne <u>w</u> L	evel Displ	lay: Co	onfig Vari	iable 🔻	Geore	eference	d: No		-								
					_												

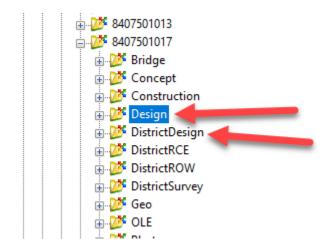
Save settings and exit the file.

The sheet file and model file are now created for the pipe design.

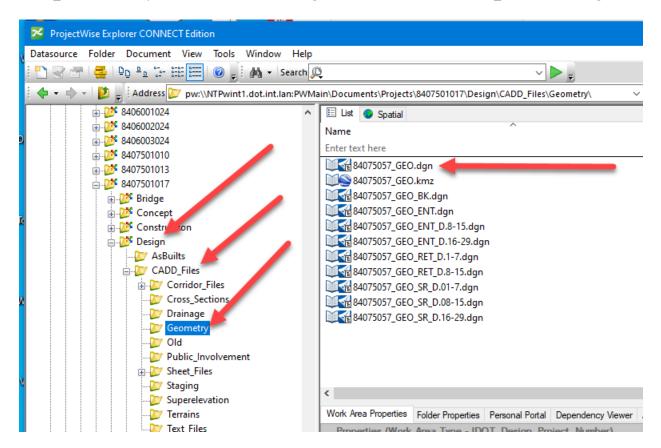
In the Bridge folder open the ORD_CCRRRPPP_DOT_PIPE_CULVERTS_Z01.dgn. Attach the survey file that contains the existing 3D pipes and surrounding topo features that are needed to do an effective design.



Next reference in the Design alignment that has an active profile. This file should be located in the Design or the District Design folder depending on what group is doing the road design portion of this project.

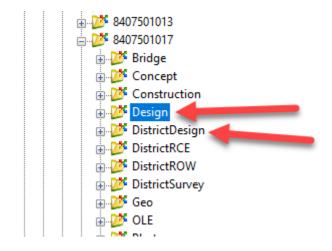


For this example, it is being done by the design group. So the alignment is under the CADD_Files\Geometry\ folder. Select the GEO Alignment file that is named GEO_CCRRRPPPZZZ.dgn.

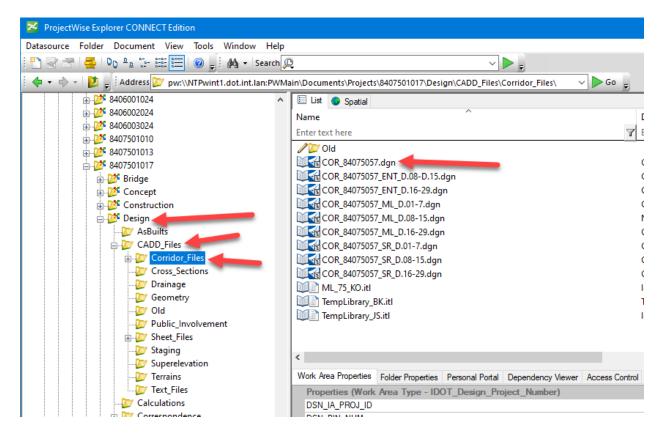


This is the container GEO file that will contain all the Alignments for this project. Attach it using the orientation of Coincident World. Turn on the live nesting and set its depth to 1.

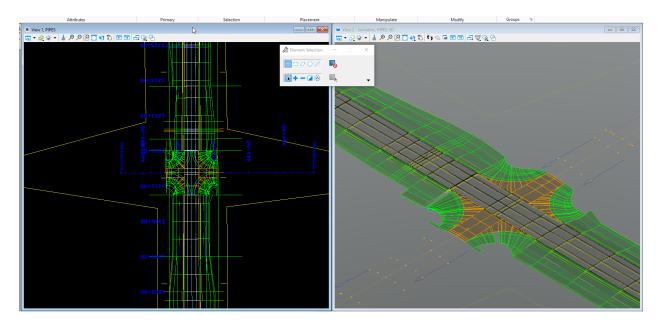
Next, reference the proposed corridor container file. This file should be located in the Design or the District Design folder depending on what group is doing the road design portion of this project.



For this example, it is being done by the design group. So the corridor file is under the CADD_Files\ Corridor_Files\folder. Select the COR Corridor file that is named COR_CCRRRPPPZZZ.dgn.



This is the container COR file that will contain all the Corridor for this project. Attach it using the orientation of Coincident World. Turn on the live nesting and set its depth to 1.



The file content should look like this:

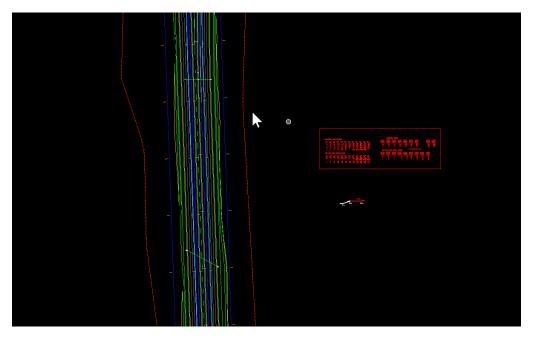
Next, reference in a file that contains a selection of Iowa DOT pipe aprons 2D cells. This file is located in pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Resources\ClientWorkspaces\IowaDOT\IowaDOTProdu ction\Organization-Civil\IowaDOT_Standards\Cell\BridgeDesignDetails\ <u>ApronsConnect.dgn</u>

Then find this refenced content. It should look like this:



Select it with the Element Selection tool.

With the Copy tool make a copy of it and place it close to the design corridor.



Then, detach the reference file and save the settings.

The last step to setting up the CADD files for pipe design is to make sure the pipe3D model is referenced into the Structures overview file. If there is not a Structures overview file in the project directory, create it with the Copy Seed tool.

opy Seed v 10.0.0.0			
File Suffix:		Name of file to create (CCRRRPPP) : C=County, R=Route, P=Parenthe	3075057_DOT_PIPE_CULVERTS_Z01
Location of file to cre	eate: Projects\8407501017\Bridge		
	ORD PIPE CULVERTS Seed		and a sector file
Choose file type:	ORD 2D Seed		Create File
	ORD 3D Seed		
	ORD Title Sheet (A)		
	ORD Detail Sheet Seed (B,J,U)		
Extension of file to c	ORD Legend Sheet Seed		Exit
	ORD Mitigation Design Sheet Seed ORD Template library		Luc Luc
	ORD STRUCTURES OVER VIEW Seed		
	ORD PIPE CULVERTS Seed		2
_	ORD STRUCTURES Seed		
	OBM 3D Seed		
	ORD Prelim Bridge Design Seed		
	Bridge Plan Production Seed		
	M Sheet Stormsewer Calc File (*.xlsm)		
	T Sheet Earthwork Calc File (*.xlsm)		
	C Sheet Bridge Approach Calc File (*.xlsx) Project Documentation File (*.xlsm)		

The Structures overview file will only contain the 3D information from the model files under the Bridge folder. Make sure only the 3D model is referenced from the

ORD_CCRRRPPP_DOT_PIPE_CULVERTS_SPN.dgn into the overview file.

Other designers will be referencing this file nested and don't need to be pulling in any information, but the models that were just created. Make sure all references to the overview file are not nested.

Now that the file is set up, start designing and calculating the pipe inverts from the project information. <u>PW02 Laying out Pipes in Connect</u>

Laying out Pipes and Drainage Design in Connect

These instructions were created March 2024. These instructions were created with:



OpenRoads Designer CE - 2022 Release 3 Update 12 Version 10.12.02.4

This product is licensed to:

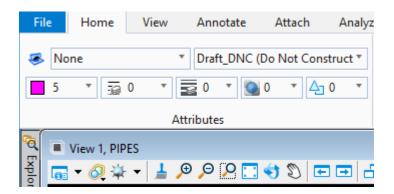
First, review the project information and determine where a pipe is needed. Once a location is determined, calculate the correct size. Refer to the BDM Chapter 4 <u>https://iowadot.gov/bridge/policy/04-01-00Prelim.pdf</u>. When the correct type, size and location are determined, design the new pipe for that location.

Open the ORD_CCRRRPPP_DOT_PIPE_CULVERTS_SPN.dgn file under the Bridge folder in the project directory for this project in ProjectWise. For this example, use the ORD_8075057_DOT_PIPE_CULVERTS_Z01.dgn file.

Once the file is open, place a pattern line at the location of each pipe needing to be designed. Set the attributes to the correct symbiology. Use the level Draft_DNC that indicates draft lines to <u>not</u> be constructed and is also set to not print on the final plans.

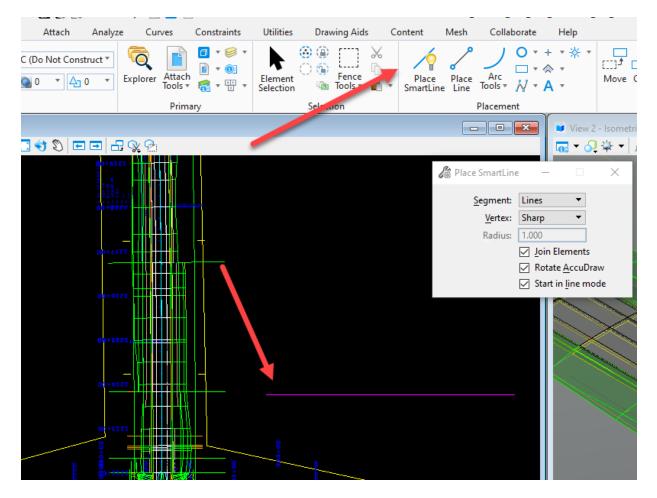
File Home View	Annotate Attach Analy	yze Cup Consti
None	Default ((none))	Show *
Δ.	ttri Search Levels	2 v
View 1, PIPES	 Draft_1 ((none)) Draft_2 ((none)) Draft_3 ((none)) Draft_4 ((none)) Draft_5 ((none)) 	
	Draft_6 ((none)) Draft_7 ((none)) Draft_8 ((none)) Draft_9 ((none))	
	Draft_DNC (Do Not Construct, I Drain_Struc (Drainage Struc) Drainage (Drainage Features (Po EdgeBed ((none)) EdgePaved (Edge of pavement) EdgeShoulder (Edge of shoulde EdgeUnpaved (Edge of unpaver	

It is preferred to also change the color to something that will stand out and make it easier to find in the file. Color 5 is recommended.



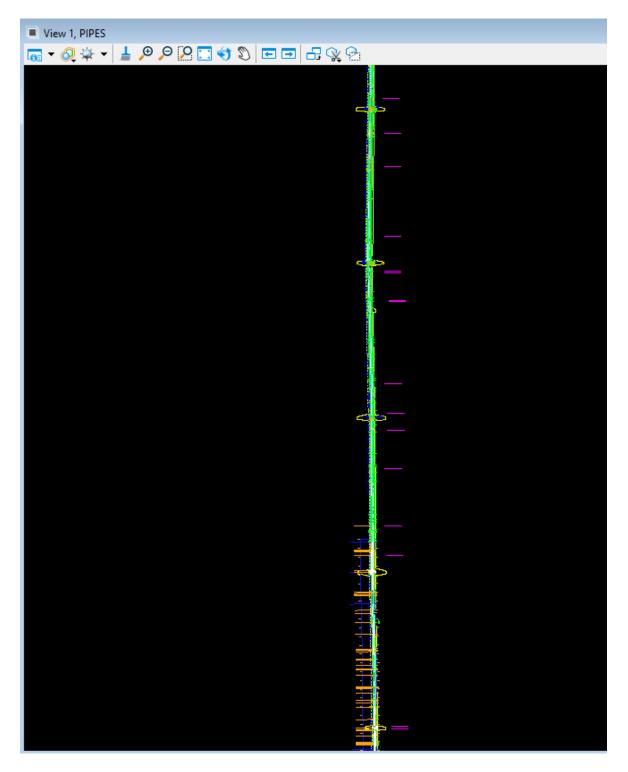
Next, use the Place Smart Line tool and place a line of 560'.

It should look similar to this:



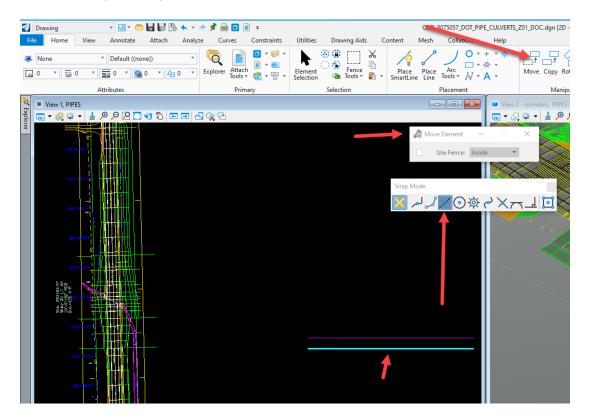
Use the copy tool to copy the line just created and place a copy at each pipe location needed.

It should look like this:



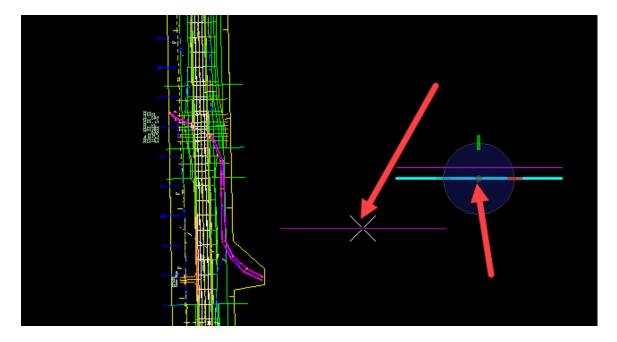
Next, move the pattern line to the location needed to place the pipe. Rotate the pattern line to the skew of the pipe also. The midpoint of the pattern line should intersect the horizonal design alignment for the project. The purpose of the pattern line is to ensure that all the pipe cross sections are the same width and that the centerline or offset in the cross section is in the center of the cross section.

To do this, use the Element Selection tool to select the pattern line. Then click on the move tool and select the midpoint snap.



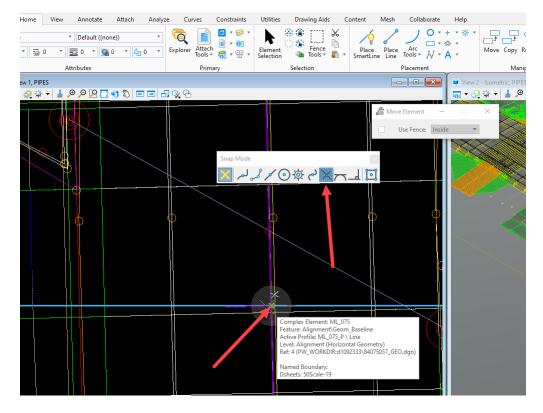
Let the tool find the midpoint on the selected line and datapoint to accept it. Then move the line to the location needed to place the pipe.

It should look like this:

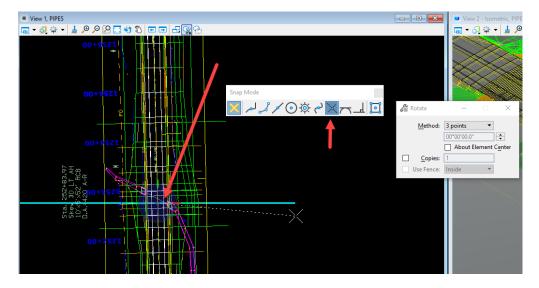


Select the intersection snap and select the location to place it on the alignment.

It should look like this:

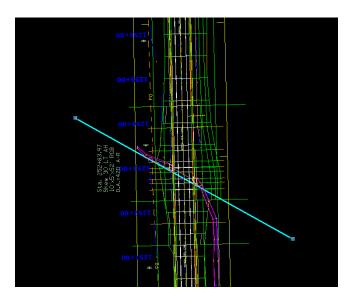


Next click the reset on the mouse once so that the pattern line is still selected with the Element Selection tool and select the rotate tool. Set the method to 3 points and with the intersection snap set, select the point where the pattern line and the alignment intersect for the first point.



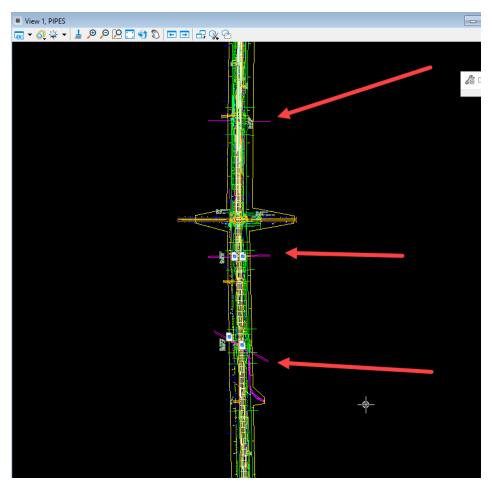
For the second point, select the end of the pattern line then select the point to rotate it to.

It should look like this:



Unselect the line with the Element Selection tool. Repeat the process for all the locations of the pipes.

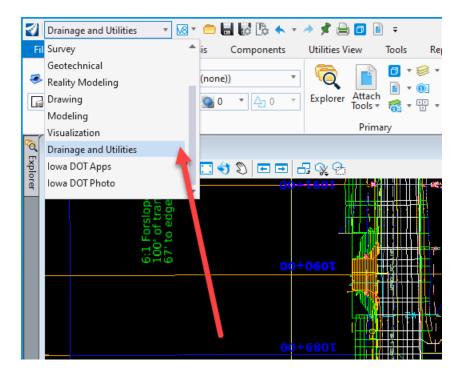
When finished, the file content should look like this:



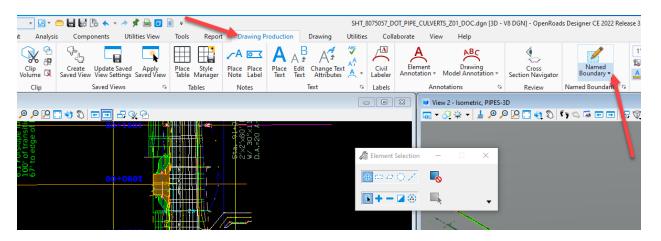
Once identifying the pipe locations is completed, switch to the pipe cross section file SHT_CCRRRPPP_DOT_PIPE_CULVERTS_SPN.dgn under the (Paren)_Work Description folder. For this example, use the SHT_8075057_DOT_PIPE_CULVERTS_Z01.dgn file.

Now that the pattern lines are in place and are in the SHT file, the files are ready to cut the cross sections.

To do this, set the workflow to Drainage and Utilities.



Next, use the place Named Boundary tool on the Drawing Production ribbon tab.



Complete the following steps for the Place Named Boundary dialog box.

- 1. Select the Place Named Boundary Civil Cross Section 2 Points tool.
- 2. Select the 2 Point Cross Section Drawing Seed:

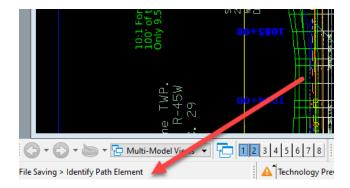
🔏 Place Named Boundary Ci	vil Cross Section 2 Points 🚽 1	×
	a 🖓 🏾 🕲 🖊 🗇 🎞	0
Drawing Seed:	2 Point Cross Sections	-2
Group:	(New) 👻	
Name:	Untitled	
Description:		
Vertical Exaggeration:	1.000000	
Top Clearance:	40.000000	
Bottom Clearance:	20.00000	
Elevation Datum Spacing:	5.000000	
	Backward Facing	
	Create Drawing	
	Show Dialog	

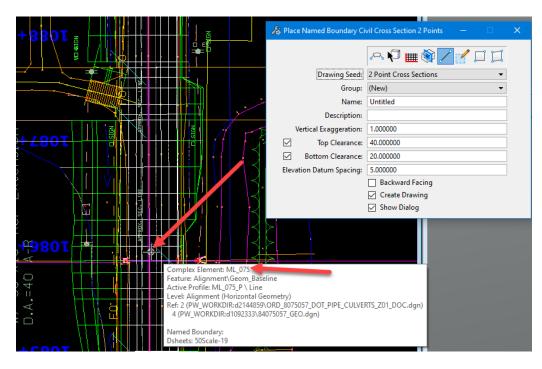
Note: For the first section cut from an alignment set the Group to (New).

Toggle on Create Drawing.

🔏 Place Named Boundary Ci	vil Cross Section 2 Points 🛛 🗖 🗌	×
	a 🖓 🏢 🎕 🖊 🖊 🎞	
Drawing Seed:	2 Point Cross Sections 🔹	
Group:	(New)	
Name:	Untitled	
Description:		
Vertical Exaggeration:	1.000000	
Top Clearance:	40.000000	
Bottom Clearance:	20.000000	
Elevation Datum Spacing:	5.000000	
	Backward Facing	
	Create Drawing	
	Show Dialog	

Follow the prompts in the lower left corner of the application window. The first prompt is Identify Path Element.



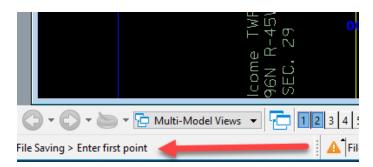


Select the design alignment that the pattern line intersects. For this example, it will be ML_075.

Once the alignment is selected, the name of the Group will populate with the alignment name.

🔏 Place Named Boundary Ci	vil Cross Section 2 Points —	\times
	~ P 🖩 🕅 🖊 🗇 🎞	
Drawing Seed:	2 Point Cross Sections 🔹	
Group:	(New) 🔻	
Name:	ML_075	
Description:		
Vertical Exaggeration:	1.000000	
Top Clearance:	40.000000	
Bottom Clearance:	20.000000	
Elevation Datum Spacing:	5.000000	
	Backward Facing	
	Create Drawing	
	Show Dialog	

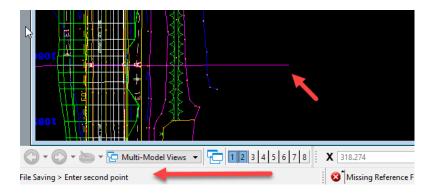
The next prompt is Enter first point.



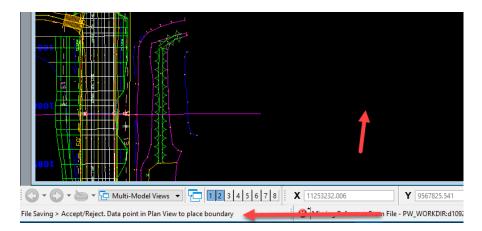
Find the pattern line and select one end of the pattern line.



The next prompt is Enter second point. Select the other end of the pattern line.



The next prompt is Accept/Reject. Data point in Plan View to place boundary.

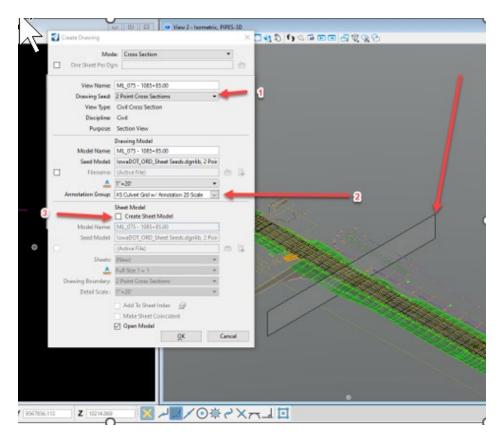


Then the boundary will be placed. Move the cursor to black space and datapoint to accept.

The Create Drawing dialog box opens.

Set the following settings.

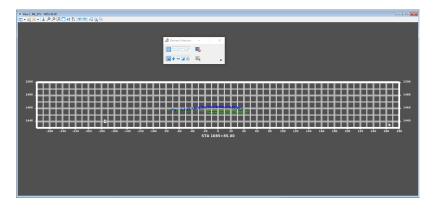
- 1. Drawing Seed to 2 Point Cross Section
- 2. Annotation Group to XS Culvert Grid w/Annotation 20 Scale
- 3. Uncheck the Create Sheet Model.



Also, notice that the boundary has been placed in the 3D model.

Once everything is set correctly, click OK. This will create and open the drawing model.

It should look like this:



It is recommended to work in the drawing model with the line weights turned off. Open the View Attributes dialog box and turn off the Line Weights and Markers.

7									
View 1, ML_075 - 1085+85.00									
	1 🗆 🐨 🖉 🖃 🕻	∍ 占 😪	2						
View Number: 1 👻 🖳									
😚 Presentation		#≡ ^							
Display Style: (Wireframe Di	isplay)	~						State Ele	ement Sele
🔒 ACS Triad	🔆 Fast Cells								
Background	🖹 Fill							⊕ :	ш <i>и</i> ()
Boundary Display	Grid							502	
🐻 Camera	宿 Level Overrides							-	4
💭 Clip Back	Line Styles								
😪 Clip Front	Line Weights								
	P Markers								
Constructions	Patterns	· `		_					
🙀 Default Lighting	Tags								
Dimensions	A Text								
📼 Data Fields	1+ Text Nodes								
Displayset	Transparency			_					
Named Presentation	સ Height Field				==			_	
🔅 Placement Point 🛛	📑 Item Types Text								
Text Field background									
Global Brightness: 🔶 <		> Q	ŢĨ					T	
🦂 View Setup		*	-180	-160	-140	-120	-100	-80	-60
Saved Views: Select	✓ ¹ / ₁ +								
Models: ML_075 - 1085+8									

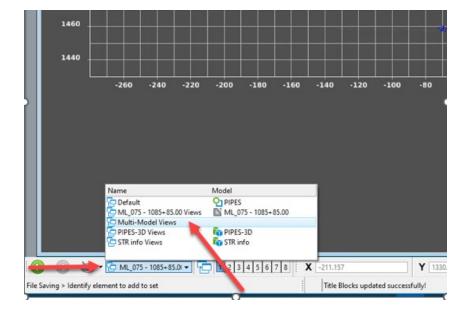
Next, turn off the Line Weights in the Saved View. Open the Reference dialog box and select the saved view in the list. Right click and select Presentation.

Sele 1.00000000 Sele 1.00000000 Sele 2.000 Se
References (27 of 27 unique, 27 displayed) Tools Properties Tools Properties Stot P File Name 1 PW WORKDIR:d2144995;SHT_8075057, DOT_PIPE (
References (27 of 27 unique, 27 displayed) Tools Properties Tools Properties Stot P File Name 1 PW WORKDIR:d2144995;SHT_8075057, DOT_PIPE (
Tools Properties Image: Solution of the second seco
Tools Properties Image: Solution of the second seco
Image: Store Piece Attach Model Description Logical Orientation Pr Image: Store Piece Attach PW_WORKDIR:d2144905\SHT_8075057_DOT_PIECe Attach Detach Model Description Logical Orientation Pr Image: Store Piece Attach PW_WORKDIR:d2144905\SHT_8075057_DOT_PIECe Attach Detach Rejoad Exchange Image: Open in New Session Activate Deactivate Deactivate Deactivate Image: Piece Attach Scale Rotate New Level Display: Config Variable Georeferenced: No Make Direct Attach.ment Add Link to Element Add Link to Element Add Link to Element Add Link to Element
Image: Store Piece Attach Model Description Logical Orientation Pr Image: Store Piece Attach PW_WORKDIR:d2144905\SHT_8075057_DOT_PIECe Attach Detach Model Description Logical Orientation Pr Image: Store Piece Attach PW_WORKDIR:d2144905\SHT_8075057_DOT_PIECe Attach Detach Rejoad Exchange Image: Open in New Session Activate Deactivate Deactivate Deactivate Image: Piece Attach Scale Rotate New Level Display: Config Variable Georeferenced: No Make Direct Attach.ment Add Link to Element Add Link to Element Add Link to Element Add Link to Element
Stot Pile Name Model Description Logical Orientation Pr 1 PW_WORKDIR-d2144905\SHT_8075057_DOT_PIPE Attach Detach PIPES-3D PIPES-3D ML_075 - 1085+85.00 Tr 1 PW_WORKDIR-d2144905\SHT_8075057_DOT_PIPE Attach Detach PipeS-3D PIPES-3D ML_075 - 1085+85.00 Tr 2 Sgale 1.00000000 Exchange Open in New Session Activate Deactivate 2 Sgale 1.00000000 Exchange Scale Scale New Level Display: Config Variable Georeferenced: No Mace Direct Attachment Add Link to Element Add Link to Element Master Master
1 PW_WORKDIR-d2144995\SHT_807505_DOT_PIPE Attach Ptach Detach Reload Exchange Open in New Session Activate Deactivate Move Scale Rotate New Level Display: Config Variable Georeferenced: No
1 PW_WORKDIR:d2144995\SHT_8075057_DOT_PIPE Attach Petach Petach Reload Egchange Open in New Session Activate Deactivate Deactivate Scale 1.00000000 New Level Display: Config Variable V Georeferenced: No
Image: Seale Seale New Level Display: Config Variable New Level Displa
Regload Exchange Open in New Session Activate Deactivate Deactivate New Level Display: Config Variable
Egchange Open in New Session Activate Period New Session Activate Scale 1.00000000 : 1.0000000 : 1.0000000 : 1.00000000 : 1.00000000 : 1.00000000 : 1.00000000 : 1.00000000 : 1.0000000 : 1.00000000 : 1.00000000 : 1.0000000 : 1.0000000 : 1.0000000 : 1.0000000 : 1.0000000 : 1.0000000 : 1.0000000 : 1.00000000 : 1.00000000 : 1.00000000 : 1.00000000 : 1.0000000 : 1.00000000 : 1.00000000 : 1.000000000 : 1.000000000 : 1.000000000 : 1.000000000 : 1.00000000 : 1.00000000 : 1.000000000 : 1.0000000000
Open in New Session Activate Open in New Session Activate Scale Deactivate Scale Copy New Level Display: Config Variable I Georefrenced: No More Copy Scale More Rotate Marge Into Master Make Direct Attachment Add Link to Element More Copy
Activate Deactivate Sgale Signer New Level Display: Config Variable Georeferenced: Now Move Copy Scale Rotate Mace Direct Attachment Add Link to Element
Deactivate Scale New Level Display: Config Variable V Georeferenced: No Move Copy New Level Display: Config Variable V Georeferenced: No Move Copy New Level Display: Config Variable V Georeferenced: No Move Copy New Level Display: Config Variable V Georeferenced: No Move Rotate Mace Direct Attachment
Scale 1.00000000 : 1.00000000 : 0.00000000 : 0.0000000 : 0.0000000 : 0.0000000 : 0.0000000 : 0.0000000 : 0.0000000 : 0.0000000 : 0.0000000 : 0.0000000 : 0.0000000 : 0.0000000 : 0.0000000 : 0.0000000 : 0.0000000 : 0.0000000 : 0.00000000 : 0.0000000 : 0.0000000 : 0.0000000 : 0.0000000 : 0.0000000 : 0.0000000 : 0.0000000 : 0.0000000 : 0.0000000 : 0.0000000 : 0.0000000 : 0.0000000 : 0.0000000 : 0.0000000 : 0.0000000 : 0.0000000 : 0.0000000 : 0.00000000 : 0.0000000 : 0.0000000 : 0.0000000 : 0.0000000 : 0.0000000 : 0.0000000 : 0.0000000 : 0.0000000 : 0.0000000 : 0.0000000 : 0.0000000 : 0.0000000 : 0.0000000 : 0.00000000 : 0.0
Scale 1.00000000 1: 1.00000000 1: 0.0000000 1: 0.0000000 1: 0.00000000 1: 0.00000000 1: 0.000000000 1: 0.0000000000
Scale 1.00000000 : 1.00000000 Rot Scale 1.00000000 : 1.00000000 Rot Scale 1.00000000 : 1.00000000 Rot Scale Rotae New Level Display: Config Variable I Georeferenced: No Merce Into Master Made Direct Attachment Add Link to Element
Scale Rotate New Level Display: Config Variable Georeferenced: No
New Level Display: Config Variable Georeferenced: No Rege Into Master Merge Into Master Marge Into Master Mad Link to Element
Merge Into Master Make Direct Attachment Add Link to Element
Make Direct Attachment Add Link to Element
Add Link to Element
Create Drawing Boundary
10 -220 -200 -180 -160 -140 -120 -100 -80 -6 <mark>Clip Mas<u>k</u> 0 20 40 60 80 100 12</mark>
Delete Clip 35+85.00
Presentation
Uddate From Saved View
Push to Saved View
Update From iModelHub
Settings

Next, turn off the Line Weights then click on the blue arow icon to Accept Changes and then Push to Saved View:

s (27 of 27 unique, 27 displayed)	Reference Presentation - O	×		
erties	Presentation	_		
* 🗅 🕉 🔶 😓 🖗 🏷 🟠 🏷	Display Style: Transparent Shadows	~		
File Name V PW_WORKDIR:d2144905\SHT_8075057_DOT_PIPE_0	Use View Flags		Orientation Presentati , ML_075 - 1085+85.00 Tran\Sho	
• • • • • • • • • • • • • • • • • • •	Clip Volume Line Styles Constructions Line Weights		ML_0/3 - 10834 63.00	Tran\Shadow
00000 : 1.00000000 Rot Diana 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Fast Cells Fill Fill Level Overrides Named Presentation Kellshirt Field	OC ay) Overrides: Always •	
	Text Field background Clip Volume Settings Forward: Back: From View From From View From From View From From From From From View From From From From From From From From			
60 -140 -120 -100 -80 -6	Cut: From View Outside: Cut: From View Synchronize View: Volume Only		80 100	120 140
	OK Can	Accept C	hanges and then Push	to Saved View

Now cut the next section. Go back to the Multi Model View by selecting the Multi Model View from the View Group at the lower left of the application window.



Cutting the next section on this alignment is done with the same steps as before except for one change. When a section is cut from an alignment, it will create a group. The group is used to help organize and orient the sections to each alignment. When cutting another section from the same alignment, choose the correct group for the correct alignment. In this example, the group was ML_075. Change the group from New to ML_075 by selecting from the drop-down list.

🔏 Place Named Boundary Ci	vil Cross Section 2 Points 🛛 🗖 🗌	×
	~ V 🖩 🕅 🖊 🗸 🗆	
Drawing Seed:	2 Point Cross Sections 🔹	
Group:	(New) 👻	
Name:	Name	
Description:	(New)	
Vertical Exaggeration:	ML_075	\
Top Clearance:	40.000000	
Bottom Clearance:	20.000000	
Elevation Datum Spacing:	5.000000	in the
	Backward Facing	
	Create Drawing	
	Show Dialog	

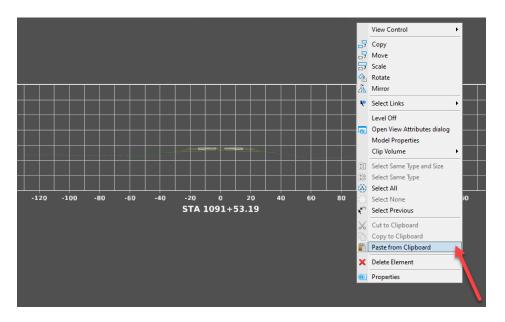
This may seem like a small detail but setting this correctly here avoids major issues later. Remember only use the New group the first time a section is cut from an alignment, then always select the correct group from then on.

Note: It is suggested to cut all the sections on a project at the same time. Change the locations of the pattern lines whenever needed throughout the design. However, removing the cross section boundary if it has been cut and recutting the section at the new location will be necessary. Make sure the correct cross section group is chosen. This helps when making the plan sheets.

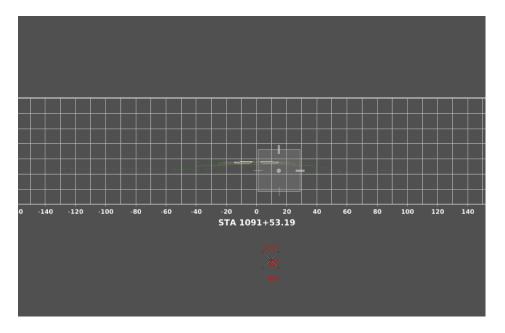
Now move onto the designing of the pipe. Start in the Multi-Model View and use the Element Selection tool to select the pipe apron template that is appropriate for the design.

For this example, use a 24" DR-201. It should look like this:

Once it is selected, press Ctrl + C on the keyboard at the same time copying the selection to the clipboard. Then open the drawing model of the cross section for the pipe design. Once in that model, right click and hold. The right click context menu displays. Select the Paste from Clipboard option.

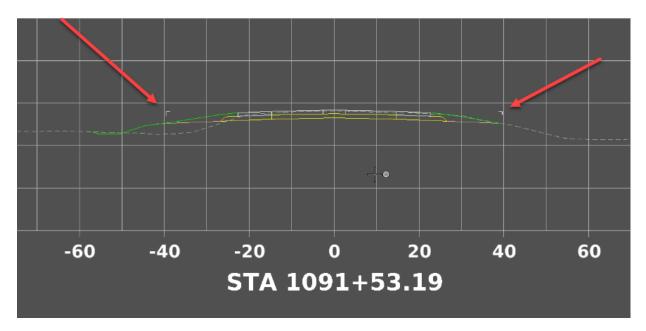


The pipe apron template placed in the clipboard will appear on the end of the cursor.



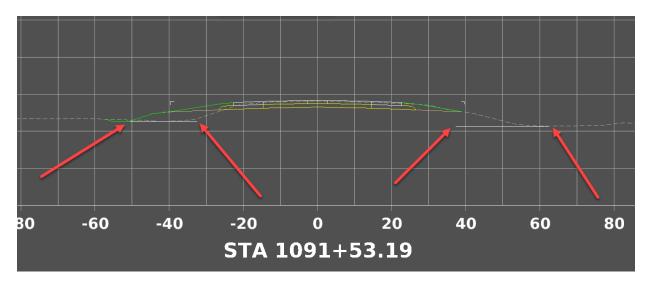
Once confident of the correct location of the new pipe and the hydraulic calculations determined the correct size, determine the clear zone at this location to meet compliance. Use AccuDraw to draw a line from the edge of travel way in the cross section to clear zone distance which marks the clear zone used to help determine the minimum length of the pipe.

It should look something like this:



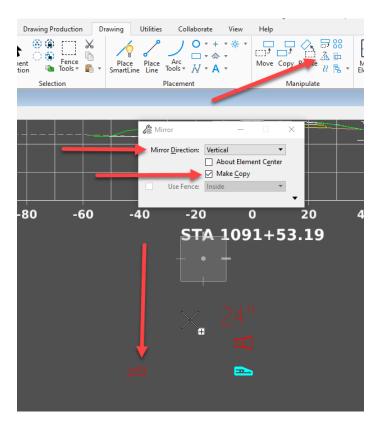
Next, set the flow lines of the pipe. This can be done in many ways depending on the location and design. For a typical crossroad pipe, it would be from one ditch grade to the other ditch grade. Use this approach for this example. Use the place line tool with the aid of AccuDraw and select the low point in each ditch to place the line.

It should look something like this:



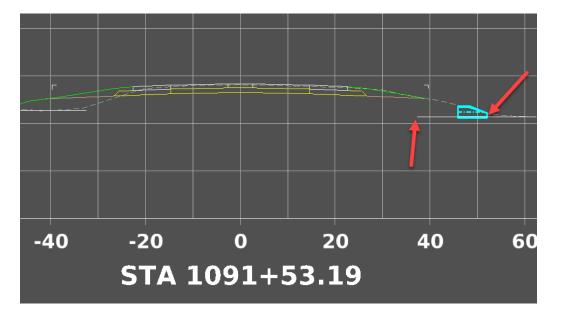
Next, select the apron template copied to this section and make a Mirror copy to use on the other end. Select the Mirror tool, set the Mirror Direction to Vertical and toggle on the Make Copy option.

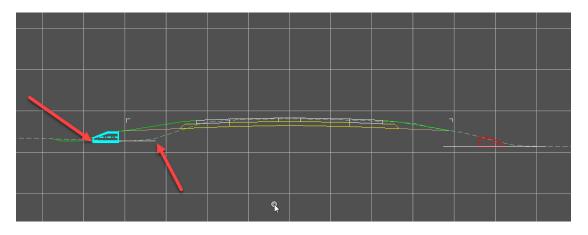
It should look something like this:



Next, select the apron template for the end of the apron and place it on the line representing the low point in the ditch grade. Make sure it is placed at the intersection of the fore slope or the clear zone marker.

It should look something like this:

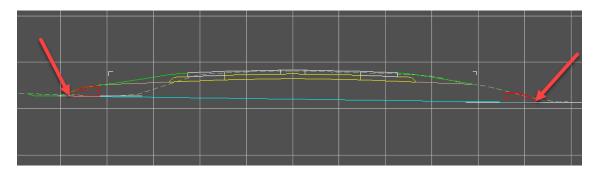




Next place the other apron the same way on the other end.

Next, place a line from the end of each apron that will represent the flow line of the proposed pipe. Change the color to blue to make it show up better.

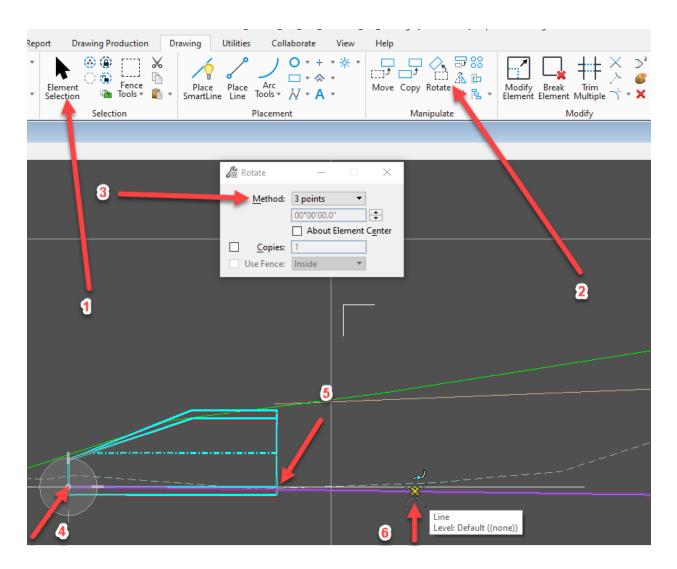
It should look something like this:



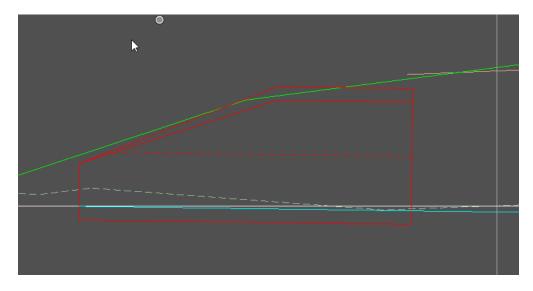
Next select the apron template at one end. Rotate the template to match the blue line that was just placed.

Follow these steps to complete.

- 1. Use the Element Selection tool to select the apron template.
- 2. Select the Rotate tool.
- 3. Select the rotate Method as 3 points.
- 4. Using an intersection snap, select the flow line of the end of the apron from the template.
- 5. Using an intersection snap, select the point of the flow line on the template that would join with the pipe.
- 6. Using a near snap, select the blue line that represents the proposed flow line of the pipe.



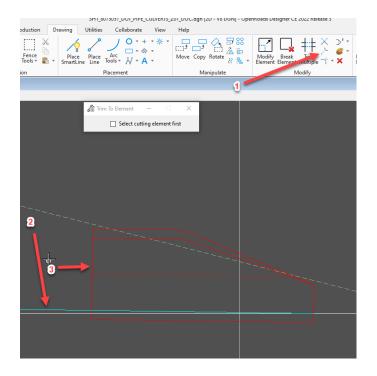
It should look something like this:



Repeat the same process on the other end of the pipe.

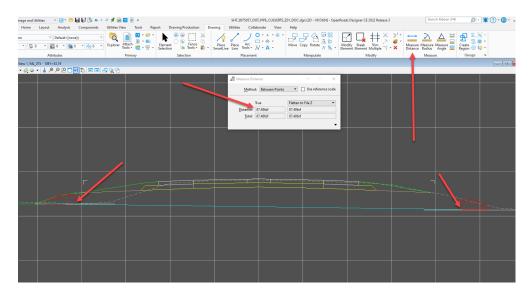
Then, use the Trim To Element tool to trim the blue line representing the proposed flow line of the pipe.

- 1. Select the Trim To Element tool.
- 2. Select the blue line.
- 3. Select the pipe apron template.

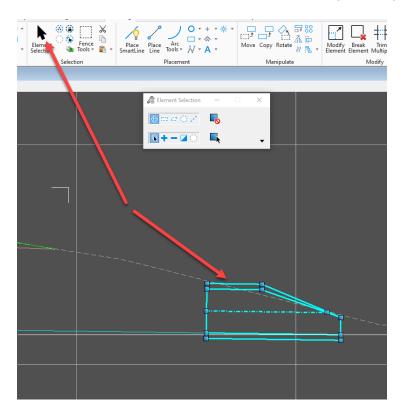


Repeat this at the other end of the pipe.

Next, use the measure distance tool to measure the blue line representing the proposed flow line of the pipe.

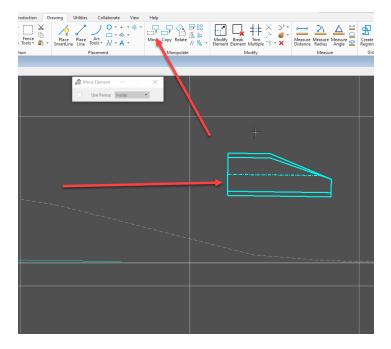


Notice the distance of the line after trimming, it is 87.486' Add 0.514' to the outlet end of the blue line representing the proposed flow line of the pipe to make it an even 88.00'. Pipe design length is constrained to even 2' intervals due to how the pipes are bid and manufactured.



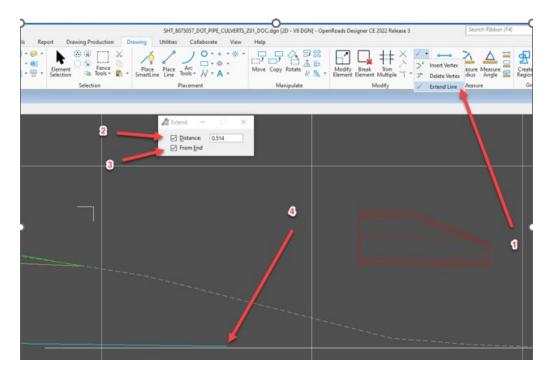
Use the Element Selection tool and select the outlet apron template.

Select the move tool and move it out of the way.

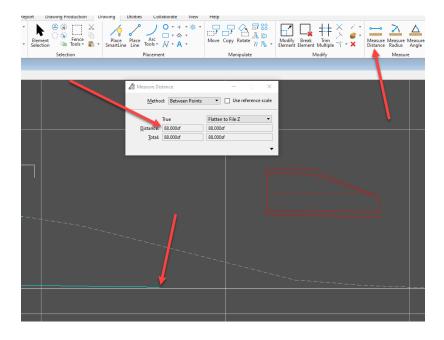


Next follow these steps to achieve the correct length.

- 1. Select the Extend line tool.
- 2. Toggle on the distance
- 3. Toggle on the From End.
- 4. Select the outlet end of the blue line representing the proposed flow line of the pipe.

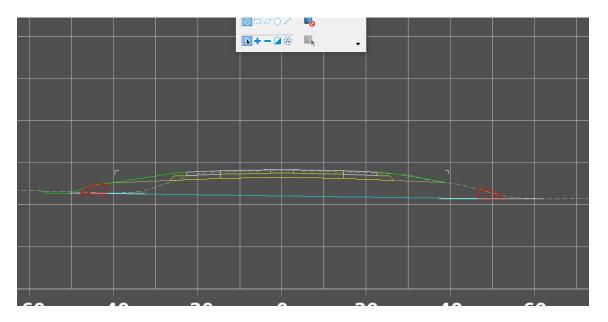


This will make the line exactly 88'. Use the measure distance tool to confirm.

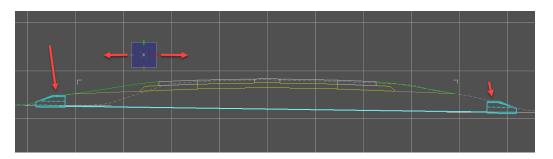


Then use the Element Selection tool to select the outlet pipe apron template and replace it to the end of the outlet end of the blue line.

It should look like this:



Next, use the Element Selection tool and select the blue line and both pipe apron templates. Then, use the move command to move it left or right to best fit the fore slopes.



Now the invert information needed to model the 3D pipes is completed. Continue to the modeling of the pipes.

PW03 Modeling Pipes in Connect

Modeling Pipes in CONNECT

These instructions were created April 2024. These instructions were created with:



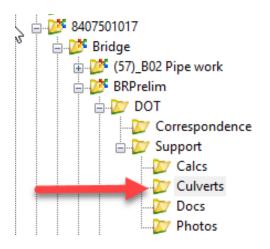
OpenRoads Designer CE - 2022 Release 3 Update 12 Version 10.12.02.4

This product is licensed to:

Once the invert coordinates of the pipes to be modeled are determined, then place them into the ASCII input file. To do this, copy the PIPE SEED.txt file from the

PWMain\Documents\Resources\ClientWorkspaces\IowaDOT\IowaDOTProduction\Organization-Civil\IowaDOT_Standards\Cell\BridgeDesignDetails\ folder to the project folder.

Iowa DOT personnel should create a Culverts folder under the \Bridge\BRPrelim\DOT\Support\ subfolder for the project and copy the text file there.



Consultant designers should create a Culverts folder under the \Bridge\BRPrelim\XYZ-CORP\Support\ subfolder for the project and copy the text file there. The XYZ-CORP folder will be renamed for the consultant contracted for the design project.

For more information refer to : Consultant ProjectWise CONNECT Bridge Project Folder Structure

Once the seed file is copied, rename it to Pipes.txt. Then open it in Notepad or other similar text editor.

It should look something like this:

	/	۶.
e Edit Format View Help 000000.000000,000000,000000,000.000.		^
-601 with DR-201 on the inlet		
000000.000000.0000000.000000.000.000.0		
800000,000000,0000000,0000000,000.000,0000		
000000.0000000.0000000.000.000.000.000		
-601 with DR-205 on the inlet		
-001 With DR-205 ON THE INDEE 000000.000000.0000000.0000000.0000.0	10 000	
000000.000000.0000000.000.000.000.000.		
000000.000000,0000000.000.000,000,000,0		
000000.000000,0000000.000000,000.000,PRO STA 00000+00.00 DR-201 Outlet end of apron 24in RCP +/- 0000.00 RT/LT		
-641		
0		
000000.000000,0000000,000.000,000,000,0		
000000.000000.0000000.000.000.000,PIP00 STA 00000+00.00 DR-122 TYPE C-3 Outlet of 00in RCP +/- 0000.00 RT/LT		
0000000,0000000,0000000,0000,000,000,0		
808080.0808080,0808080.0808080.0808080.080.		
000000.0000000.0000000.000000.000.000.		
000000.000000,0000000.00000,000.000,PRO STA 00000+00.00 DR-203 Outlet end of apron of DR-641 00in CMP +/- 0000.00 RT/LT		
P Median Drain DR-601 000000.000000,000000,000000,000.000.PRO STA 00000+00.00 DR-201 or DR-205 or DR-202 Inlet end of apron 00in RCP Median Drain +/- 0000.00 RT/LT		
000000.000000.000000.000000.000.000.00		
000000.000000,0000000.000.000,000.000,PIP00 STA 00000+00.00 DR-601 24in RCP Median Drain +/- 0000.00 RT/LT		
000000.000000,0000000.0000,000.000,PRO STA 00000+00.00 DR-201 Outlet end of apron 24in RCP Median Drain +/- 0000.00 RT/LT		
P Phase 1 and 2		
000000.000000.0000000.000000.000.000.0	C/LT	
000000.000000,0000000.000.000,000.000,PIP00 STA 00000+00.00 DR-601 Inlet or Outlet of 00in RCP PHASE 1 +/- 0000.00 RT/LT	/	
000000.000000,0000000.000000,000.000,PIP00 STA 00000+00.00 DR-121 Inlet or Outlet of 00in RCP PHASE 1 +/- 0000.00 RT/LT		
000000.000000.0000000.0000000,000.000,PIP000 STA 00000-00.00 DR-121 Inlet or Outlet of 00in RCP PHASE 2 +/- 0000.00 RT/LT		
800000.000000,0000000.000000.000000.000.	глт	
20000-000000-000000-000000-000-000-000 Jun 20000+00.00 Du-201 DL DU-203 DL DU-203 THIEL DL DUFEL END OF #PROF 001 UL PROF 2 +/- 0000-00 UL	101	~
	>	1
Ln 1, Col 1 100% Windows (CRLF) UTF-8		

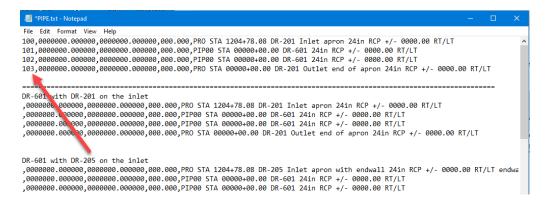
This file was made to provide some of the templates of the data that will be stored and saves some of the typing that is needed to create the ASCII input file. Now, find the template that best suits the pipe design and highlight it in the lower portion of the file and make a copy of it. For this example, the design is for a typical crossroad pipe that would be a DR-601.

IPIE.txt - Notepad	- 🗆 ×
ile Edit Format View Help	
0000000.0000000.0000000.000.000,	
R-601 with DR-201 on the inlet 🚽	
0000000.0000000.0000000.0000000.000.00	
3000000.000000,0000000.000000,000.000,PIP00 STA 00000+00.00 DR-601 24in RCP +/- 0000.00 RT/LT 3000000.000000,0000000.0000000,000.000,PIP00 STA 00000+00.00 DR-601 24in RCP +/- 0000.00 RT/LT	
0800000.0000000.0000000.0000000.000.000	
R-601 with DR-205 on the inlet 0000000.000000,0000000.0000000,000.000,PRO STA 1204+78.08 DR-205 Inlet apron with endwall 24in RCP +/- 0000.00 RT/LT e	dwall flowling elevation 000 000
0000000.0000000,0000000.000000,000.000,000 000	
0000000.000000,0000000.000000,000.000,PIP00 STA 00000+00.00 DR-601 24in RCP +/- 0000.00 RT/LT	
0000000.000000,0000000.000000,000.000,PRO STA 00000+00.00 DR-201 Outlet end of apron 24in RCP +/- 0000.00 RT/LT	
R-641	200 00 PT // T
000000.000000,0000000.000000,000.000,PRO STA 00000+00.00 DR-201 or DR-205 Inlet of DR-641 end of apron 00in RCP +/- 0000000.000000,0000000.000000,000.000,PIP00 STA 00000+00.00 DR-641 Inlet of 00in RCP +/- 0000.00 RT/LT	500.00 KI/LI
3000000.0000000,0000000.0000000,000.00000,PIP00 STA 00000+00.00 DR-122 TYPE C-3 Outlet of 00in RCP +/- 0000.00 RT/LT	
0000000.000000,0000000.00000,000.000,010000 STA 00000+00.00 DR-122 TYPE C-3 Inlet of 00in CMP +/- 0000.00 RT/LT	
3000000.000000,0000000.000000,000.000,PIP000 STA 00000+00.00 elbow in DR-641 00in CMP +/- 0000.00 RT/LT	
3000000.000000,0000000.000000,000.000,PIP000 STA 00000+00.00 elbow in DR-641 00in CMP +/- 0000.00 RT/LT 3000000.000000,0000000.000000,000.000,PIP000 STA 00000+00.00 Outlet DR-641 00in CMP +/- 0000.00 RT/LT	
3000000.000000,0000000.000000,000.000,000,000 STA 00000+00.00 DR-203 Outlet on of apron of DR-641 00in CMP +/- 0000.00 R	/LT
CP Median Drain DR-601	
0000000.000000,0000000.000000,000.000,PRO STA 00000+00.00 DR-201 or DR-205 or DR-202 Inlet end of apron 00in RCP Medi	n Drain +/- 0000.00 RT/LT
3000000.000000,00000000,000000,000.000,PIP00 STA 00000+00.00 DR-601 24in RCP Median Drain +/- 0000.00 RT/LT	
000000.000000,0000000.000000,000.000,PIP00 STA 00000+00.00 DR-601 24in RCP Median Drain +/- 0000.00 RT/LT 0000000.000000,0000000.000000,000.000.PRO STA 00000+00.00 DR-201 Outlet end of apron 24in RCP Median Drain +/- 0000.0	RT/LT
P. Phase 1 and 2	
000000.000000,0000000.000000,000.000,PRO STA 00000+00.00 DR-201 or DR-205 or DR-202 Inlet or Outlet end of apron 00i 0000000.000000,0000000.000000,000.000,PIPO0 STA 00000+00.00 DR-601 Inlet or Outlet of 00in RCP PHASE 1 +/- 0000.00 RT	
000000.000000.000000.000000.000000.0000,PIP00 STA 00000+00.00 DR-121 Inlet or Outlet of 00in RCP PHASE 1 +/- 0000.00 RT	
0000000.000000,0000000.00000,000.000,010000 STA 00000+00.00 DR-121 Inlet or Outlet of 00in RCP PHASE 2 +/- 0000.00 R	
0000000.000000,0000000.0000000,000.000,PIP000 STA 00000+00.00 DR-601 Inlet or Outlet of 00in RCP PHASE 2 +/- 0000.00 R	
000000.000000,0000000.000000,000.000,PRO STA 00000+00.00 DR-201 or DR-205 or DR-202 Inlet or Outlet end of apron 00i	RCP PHASE 2 +/- 0000.00 RT/LT
	>

Then paste it at the top of the file like this:

III *PIPE.txt - Notepad	- 🗆 X
File Edit Format View Help ,0000000.0000000,0000000.000000.0000.0	
DR-601 with DR-201 on the inlet ,0000000.000000,0000000.0000000,000.000 PRO STA 1204+78.08 DR-201 Inlet apron 24in RCP +/- 0000.00 RT/ ,0000000.000000,0000000.0000000,0000.000 STA 00000+0.00 DR-601 24in RCP +/- 0000.00 RT/LT ,0000000.000000,000000.000000,000000,PTPO STA 00000+00.00 DR-601 24in RCP +/- 0000.00 RT/LT ,0000000.000000,000000.000000,000000,PTPO STA 00000+00.00 DR-201 24in RCP +/- 0000.00 RT/LT ,0000000.000000,000000.000000.00000,000 PTPO STA 00000+00.00 DR-201 24in RCP +/- 0001.00 RT/LT	
DR-601 with DR-205 on the inlet ,0000000.0000000.0000000.0000000.000.00	
DR-641 ,0000000.000000,0000000.000000,000.000,PRO STA 00000+00.00 DR-201 or DR-205 Inlet of DR-641 end of ap ,0000000.0000000,0000000.000000,000.000,PIP00 STA 00000+00.00 DR-641 Inlet of 001n RCP +/- 0000.00 RT/ ,0000000.0000000,0000000.0000000,000.000,PIP00 STA 00000+00.00 DR-122 TYPE C-3 Outlet of 001n RCP +/- 0 ,00000000.0000000,0000000.000000,000.000,PIP000 STA 00000+00.00 DR-122 TYPE C-3 Inlet of 001n RCP +/- ,00000000.0000000,0000000.0000000,000.PIP000 STA 00000+00.00 DR-122 TYPE C-3 Inlet of 001n RCP +/- ,00000000.0000000,00000000.0000000,0000.PIP000 STA 00000+00.00 DR-121 DNoi IN CP +/- ,00000000.0000000,00000000.0000000,000.PIP000 STA 00000+00.00 DLOw in DR-641 001n CMP +/- ,00000000.0000000,00000000.0000000,000.000,PIP000 STA 00000+00.00 DLOw in DR-641 001n CMP +/- ,00000000.0000000,00000000.0000000,000.000,PIP000 STA 00000+00.00 DLOw in DR-641 001n CMP +/- ,00000000.0000000,0000000.0000000,000.000,PIP000 STA 00000+00.00 DLOw in DR-641 001n CMP +/- ,00000000.0000000,0000000.0000000,0000,000,PIP000 STA 00000+00.00 DLOW in DR-641 001n CMP +/- 00000000.0000000,00000000.0000000,000,0	T I bool.00 RT/LT /LT /LT r
RCP Median Drain DR-601 ,0000000.000000,0000000.000000,000.000,PRO STA 00000+00.00 DR-201 or DR-205 or DR-202 Inlet end of ap ,0000000.000000,0000000.0000000,000.000.PTP00 STA 00000+00.00 DR-601 24in RCP Median Drain +/- 0000.00 ,00000000.0000000,0000000.0000000,000.PTP00 STA 00000+00.00 DR-601 24in RCP Median Drain +/- 0000.00 ,00000000.0000000,0000000.000000,000.000,PT00 STA 00000+00.00 DR-201 Outlet end of apron 24in RCP Median	RT/LT RT/LT
RCP Phase 1 and 2 ,0000000.000000,000000.000000,000.000,PRO STA 00000+00.00 DR-201 or DR-205 or DR-202 Inlet or Outlet ,0000000.000000,0000000.0000000,000.000.PTP00 STA 00000+00.00 DR-601 Inlet or Outlet of 00in RCP PHASE ,00000000.000000,0000000.0000000,000.PTP00 STA 00000+00.00 DR-121 Inlet or Outlet of 00in RCP PHASE ,00000000.000000,0000000.000000,000.000,PTP00S STA 00000+00.00 DR-121 Inlet or Outlet of 00in RCP PHASE	1 +/- 0000.00 RT/LT 1 +/- 0000.00 RT/LT
<u> </u>	Ln 1, Col 1 100% Windows (CRLF) UTF-8

Next, add the point number to each line. It is suggested to start with 100.



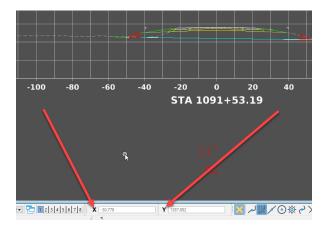
Next fill out the station and set the first feature number like this.

	_	~
- *PIPE.txt - Notepad -	L L	×
File Edit Format View Help		
100,0000000.000000,0000000.00000,000.000,PRO STA 1002.55.19 DR-201 Inlet apron 24in RCP +/- 0000.00 RT/LT		^
101,0000000.000000,000000.00000,000.000.		
102,0000000.000000,0000000.0000000.000,000.000,PIP0 <u>1 STA 1091+53</u> .19 DR-601 24in RCP +/- 0000.00 RT/LT		
103,0000000.000000,0000000.00000,000.000.		
DR-601 with DR-201 on the inlet		
,0000000.000000,0000000.000000,000.000,PRO STA 1204+78.08 DR-201 Inlet apron 24in RCP +/- 0000.00 RT/LT		
,0000000.000000,0000000.000000,000.000,PIP00 STA 00000+00.00 DR-601 24in RCP +/- 0000.00 RT/LT		
,0000000.000000,0000000.000000,000.000,PIP00 STA 00000+00.00 DR-601 24in RCP +/- 0000.00 RT/LT		
,0000000.000000,0000000.000000,000.000,PRO STA 00000+00.00 DR-201 Outlet end of apron 24in RCP +/- 0000.00 RT/LT		
DR-601 with DR-205 on the inlet		
,0000000.000000,0000000.000000,000.000,PRO STA 1204+78.08 DR-205 Inlet apron with endwall 24in RCP +/- 0000.00 RT/ ,0000000.000000,0000000.0000000,000.000,PIP00 STA 00000+00.00 DR-601 24in RCP +/- 0000.00 RT/LT	LI en	.dwa
,0000000.0000000,0000000,000.000,000,00		

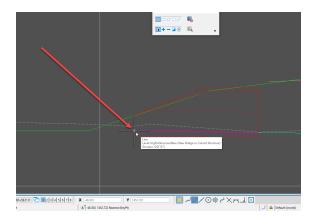
Go back to the cross section used to design the pipe. Open the AccuDraw settings and make sure it is set to Rectangular under the Coordinates tab.

🍫 AccuDraw	Settings	- C	×
Operation	Display	Coordinates	
Coordinate	System		
<u>R</u> otation:	View	•	
Туре:	Rectangular	-	
Unit Round	off		
D <u>i</u> stance:	0.000		
A <u>n</u> gle:	00°00'00.0"		
Indexing -			
	Axis		
	✓ Distance		
<u>T</u> olerance:	10		

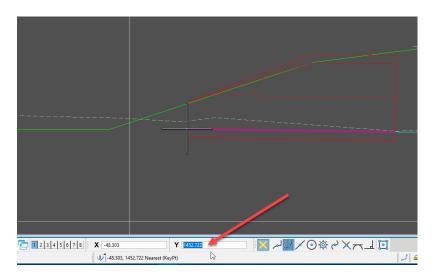
This will provide the Coordinates read out at the bottom of the application window.



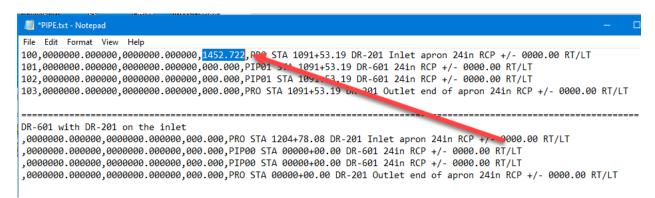
Then in the cross section, select the Element Selection tool and make a tentative snap to the end of the inlet apron in the design.



The AccuDraw Coordinates readout is displaying the Elevation in the Y window and the offset in the X window. Highlight the number in the Y window and use the Ctrl + C keys on the keyboard to copy that number.



Then go to the ASCII input file and paste the inlet elevation in the correct location.

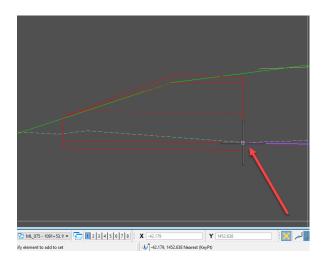


Next, copy the offset from the X window of the AccuDraw Coordinates readout display and paste it in the correct location in the ASCII input file.

*PIPE.txt - Notepad									
File Edit Format View	Help								
.00,000000.000000	,0000000.000000,1	452.722,PRO S	TA 1091+53.19 D	R-201 Inlet e	nd of apron 24	lin RCP <mark>-48</mark>	.303 LT		
01,0000000.000000	,0000000.00000,0	00.000,PIP01	STA 1091+53.19	DR-601 24in R	CP +/- 0000.0) RT/LT			
02,0000000.000000	,0000000.00000,0	00.000,PIP01	STA 1091+53.19	DR-601 24in R	CP +/- 0000.0) RT/LT			
03,0000000.000000	,0000000.00000,0	00.000, PRO ST	A 1091+53.19 DR	-201 Outlet e	nd of apron 24	in RCP +/-	0000.00	RT/LT	-
R-601 with DR-201 0000000.000000,00 0000000.000000,00 0000000.000000,00 0000000.000000,00	00000.000000,000 00000.000000,000 00000.000000,000	.000,PIP00 STA .000,PIP00 STA	00000+00.00 DR 00000+00.00 DR	-601 24in RCP -601 24in RCP	+/- 0000.00	RT/LT RT/LT		 T/LT	 I

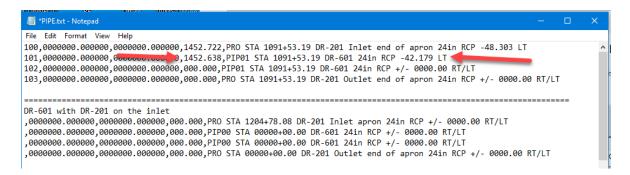
Then in the cross section, select the Element Selection tool and make another tentative snap to the junction of the pipe apron and the first pipe section at the flowline.

It should look something like this:



Then copy and paste the elevation and offset from the AccuDraw Coordinates readout and paste it in the correct location in the ASCII input file.

it should look something like this.



Repeat the process at the other end of the pipe starting at the junction of the pipe apron (the last section of the pipe at the flowline of the outlet) and the point at the end of the outlet apron and paste them in the ASCII input file.

When done it should look like this:

		X
File Edit Format View Help		
<pre>Inc lut format view field 100,0000000.000000,0000000.000000,1452.722,PRO STA 1091+53.19 DR-201 Inlet end of apron 24in RCP -48.303 LT 101,0000000.000000,0000000.000000,1452.638,PIP01 STA 1091+53.19 DR-601 24in RCP -42.179 LT 102,0000000.000000,0000000.000000,1451.439,PIP01 STA 1091+53.19 DR-601 24in RCP +45.814 RT 103,000000.000000,0000000.000000,1451.356,PRO STA 1091+53.19 DR-201 Outlet end of apron 24in RCP +51.938 RT</pre>		^
DR-601 with DR-201 on the inlet ,0000000.000000,0000000.000000,000.000,PRO STA 1204+78.08 DR-201 Inlet apron 24in RCP +/- 0000.00 RT/LT ,0000000.000000,0000000.000000,000.000,PIP00 STA 00000+00.00 DR-601 24in RCP +/- 0000.00 RT/LT ,0000000.000000,0000000.000000,000.000,PIP00 STA 00000+00.00 DR-601 24in RCP +/- 0000.00 RT/LT ,0000000.000000,0000000.000000,000.000,PRO STA 00000+00.00 DR-201 Outlet end of apron 24in RCP +/- 0000.00 RT/L	 т	
DR-601 with DR-205 on the inlet ,0000000.000000,0000000.000000,000.000,PRO STA 1204+78.08 DR-205 Inlet apron with endwall 24in RCP +/- 0000.00 ,0000000.000000,0000000.000000,000.000,PIP00 STA 00000+00.00 DR-601 24in RCP +/- 0000.00 RT/LT	RT/LT e	ndwa

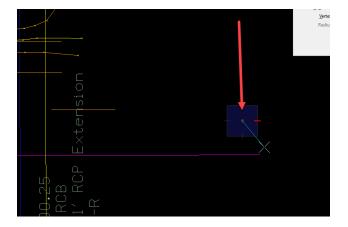
Keep in mind that up to 256 characters can be used to describe the point that will be mapped. On the outlet it is suggested to include the comment that will become the notes on the schedule sheet. This will make it easier to input the information into the database by copying and pasting and not retyping it. This note can consist of any information appropriate to convey to the contractor building the pipe. For example, "Jack new 24" RCP. Remove Existing pipe at Sur Sta. 1090+68.1 or will be plugged and abandoned with flowable mortar." For this example, use "Culvert is designed to be cut and cover. Lay 88' of 24" 2000D RCP with two DR-201 Aprons."

Next, calculate the X and Y Coordinates of the four points in the ASCII input file. To do this, close and check in the SHT file and open the ORD model file under the Bridge folder. Once the file is open, find the pattern line used to cut the cross section from. For this example, it was the line at STA 1091+53.19.

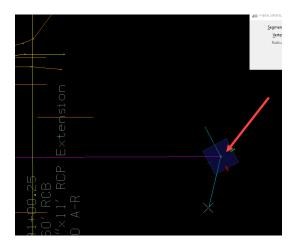
Hint: If uncertain where to look in the file for the pattern line, using the Open Cross Section View tool is helpful in locating the pattern line.

Next, place construction lines to locate the x and Y Coordinates. With the Place Smart Line command and AccuDraw on, locate the left off set points. Start on the right side of the pattern line making the first point just above or below the pattern line.

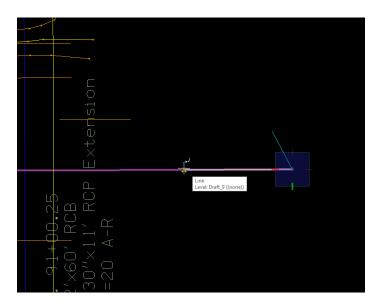
It should look like this:



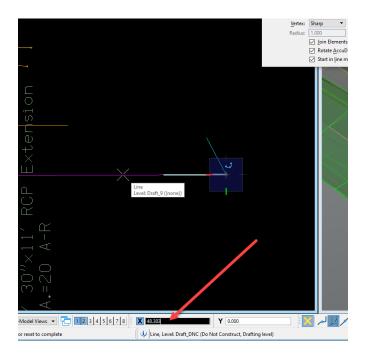
Next snap to the end of the pattern line.



Now, on the keyboard type Q then R. This is the command in AccuDraw to quick rotate. This will make the AccuDraw compass rotate. Then, select the near snap and snap on the pattern line. This assures the line will be drawn exactly along the pattern line.

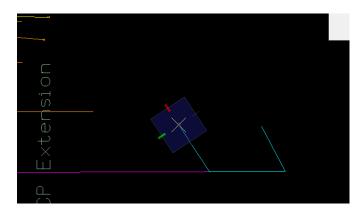


Next, type in the left offset distance to the end of the left apron stored in the ASCII input file. For this example, it is -48.303.

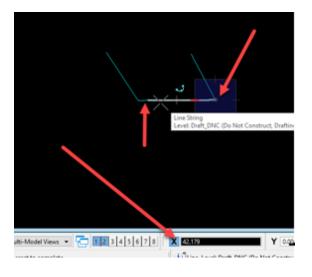


Then draw a line off that point to make it easier to find.

It should look something like this:

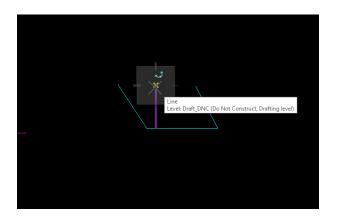


Next, select the smart line just created and move it off the pattern line to make it easier to define the other points. Next, define the next point that is left of the centerline. To do this, snap to the smart line from the measured point and rotate the compass to match the last distance point and type in the next offset distance (like before). For this example, it will be 42.179.



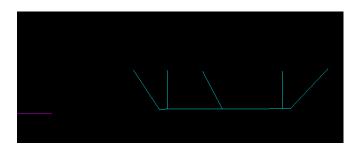
Then draw a line to make it easier to snap.

It should look something like this:

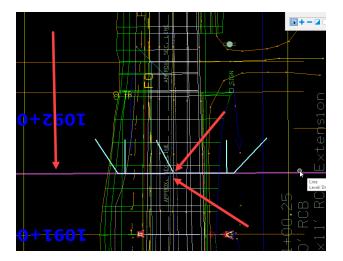


Next, draw lines for the right off set points (same way as the left points).

It should look something like this:

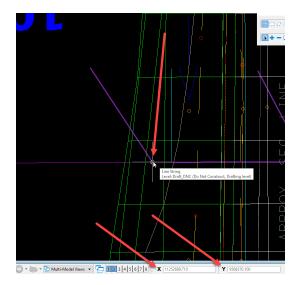


Now with the Element Selection tool, select the smart lines just created. Move them to the location to do this snap to the centerline point and place it at the intersection of the alignment and the pattern line.



Once it is moved, then unselect the smart lines that were moved into place.

Next, make a tentative snap to the first point to define the X and Y coordinates in the ASCII input file.



Next, copy the Y and X coordinates and paste them into the ASCII input file in the correct locations.

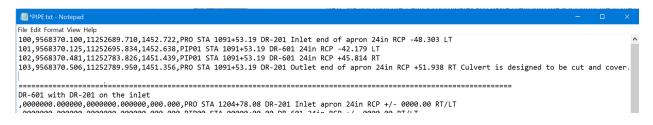
Hint: Remember that ASCII input file stores the coordinates as Y - X - Z in that order.

It should look something like this:

*PPE.txt - Note	epad	×						
File 衬it Format V	/iew Help							
100, <mark>9568370.</mark>	100,11252689.	<mark>/10</mark> ,1452.722,P	RO STA 1091+	53.19 DR-201	Inlet en	d of apron 24	in RCP -48.3	03 LT
101,0000000.0	000000,000000	0.000000,1452.	638,PIP01 ST	A 1091+53.19	DR-601 2	4in RCP -42.1	79 LT	
102,0000000.0	000000,000000	.000000,1451.	439,PIP01 ST	A 1091+53.19	DR-601 2	4in RCP +45.8	14 RT	
103,0000000.0	000000,000000	.000000,1451.	356,PRO STA	1091+53.19 D	R-201 Out	let end of ap	ron 24in <mark>R</mark> CP	+51.938 RT C
	DR-201 on the							
,0000000.0006	000,0000000.00	,000,000,000	PRO STA 1204	+78.08 DR-20	1 Inlet a	pron 24in RCP	+/- 0000.00	RT/LT
0000000 0000	,	000 000 000	DTDAA CTA AA	םם מט מטיממט	601 21in	DCD 1/ 0000	00 DT/IT	

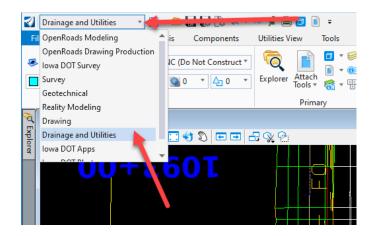
Repeat on the other points and finish the structure in the ASCII input file.

It should look like this once completed:

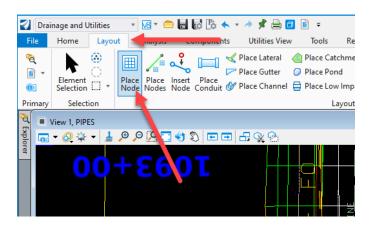


Now, the file is ready to model the pipe in the model file.

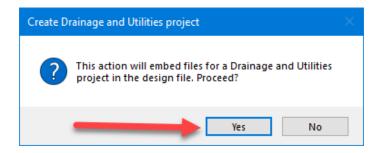
First change the workflow to Drainage and Utilities.



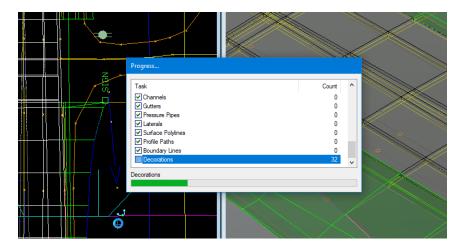
Then select the Place Node tool in the Layout tab.



A prompt to proceed will display. Click Yes. This only displays the first time the DU tools are leveraged.



Next, set the file up to use the Drainage and Utilities tools.



Make sure to work in view 1, the 2D model. Select the Place Node tool again. It will open the dialog box needed to define the Feature Definition, the Name Prefix and the Elevation constraints.

First, set the Feature.

For this example, it will be 24 in DR-201.

			A Place Node	- T X
🔏 Place Node 💊	– 🗆 🗙		Feature	
Feature	*		Feature Definition	P-DR-201 Type-1(24")Circular
Feature Definition	P-DR-201 Type-1(24'')Circular 🗸	1	Name Prefix	ElectricalNode ▲ ⊕- D GasNode
		4	Elevation	E-D StomWaterNode
Name Prefix	HW		Elevation is the Invert	iar-jiii Pedestrian Tunnel head walls iar-jiii Pipe Aprons
Elevation			Elevation	Aprons None
Elevation			Vertical Offset	CMP Aprons
Elevation is the Invert				⊕ → D Arched
Elevation	934.345	1	Baseline Reference	 in→ipi Circular in→ipi Existing
			Baseline Reference	Proposed
Vertical Offset	0.000		Rotation	E-Circular DR-201 Type 1
Baseline Reference	·e 🔥		Rotation Mode	…
baseline Kererene	÷ **		Rotation	P-DR-201 Type-1(18")Circular
Baseline Reference			- Hotation	P-DR-201 Type-1(21")Circular
			$\tilde{\sim}$	P-DR-201 Type-1(24) Circular
Rotation	*			@ P-DR-201 Type-1(30")Circular
Rotation Mode	Absolute	1	 I 	P-DR-201 Type-1(36'')Circular
D Deterior		- -		<pre></pre>
Rotation	N90°00'00.0"E		$(\mathbf{O} \mid \mathbf{I})$	

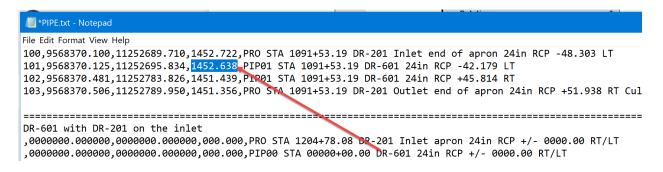
Next, place the Name Prefix. This will be a part of the description from the ASCII input file. It will consist of the Station, standard, description and offset.

i *PIPE.txt - Notepad
File Edit Format View Help
100,9568370.100,11252689.710,1452.722,PRO STA 1091+53.19 DR-201 Inlet end of apron 24in RCP -48.303 LT
101,9568370.125,11252695.834,1452.638,PIP01 STA 1091+53.19 DR-601 24in RCP -42.179 LT 🔪
102,9568370.481,11252783.826,1451.439,PIP01 STA 1091+53.19 DR-601 24in RCP +45.814 RT
103,9568370.506,11252789.950,1451.356,PRO STA 1091+53.19 DR-201 Outlet end of apron 24in RCP +51.938 RT Culvert i
DR-601 with DR-201 on the inlet
,0000000.000000,0000000.000000,000.000,PRO STA 1204+78.08 DR-201 Inlet apron 24in RCP +/- 0000.00 RT/LT 🔪
,0000000.000000,00000000.00000,000.000,PIP00 STA 00000+00.00 DR-601 24in RCP +/- 0000.00 RT/LT
,0000000.000000,00000000.000000,000.000,PIP00 STA 00000+00.00 DR-601 24in RCP +/- 0000.00 RT/LT
,0000000.000000,0000000.000000,000.000,000,PRO STA 00000+00.00 DR-201 Outlet end of apron 24in RCP +/- 0000.00 RT/LT

This is why it is easier to type it in the ASCII input file and then copy and paste it in the Name Prefix field instead of typing it in the Name Prefix each time. This also maintains consistency in the naming of the descriptions.

Place Node	- 🗆 X
Feature	*
Feature Definition	P-DR-201 Type-1(24'')Circular 🗸
Name Prefix	nd of apron 24in RCP -48.303 LT
Elevation	*
Elevation is the Invert	
Elevation	934.345
Vertical Offset	0.000
Baseline Referen	ce 🔺
Baseline Reference	
Rotation	*
Rotation Mode	Absolute 🗸
Rotation	N90°00'00.0"E

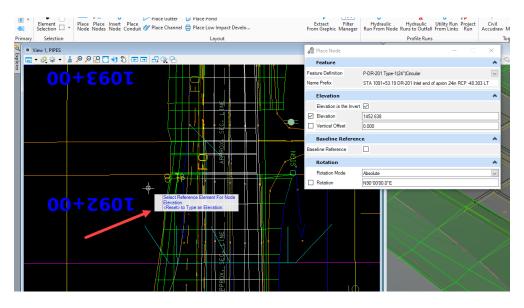
Last, define the invert elevation. The invert elevation is the elevation at the connection of the pipe apron and the first pipe section. For this example, it will be 1452.638



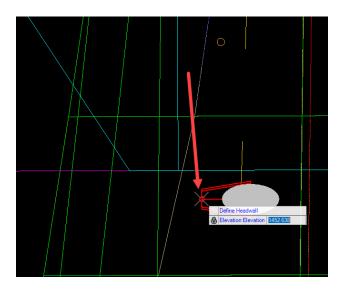
This can be copied from the ASCII input file then pasted into the field. Toggle on the Elevation is the Invert and the Elevation options.

🔏 Place Node		×
Feature		*
Feature Definition	P-DR-201 Type-1(24")Circular	\sim
Name Prefix	STA 1091+53.19 DR-201 Inlet end of apron 24in RCP -48.303 LT	
Elevation		٨
Elevation is the Invert		
Elevation	1452.638	
Vertical Offset	0.000	
Baseline Reference	e e	٨
Baseline Reference		
Rotation		*
Rotation Mode	Absolute	\sim
Rotation	N90°00'00.0''E	

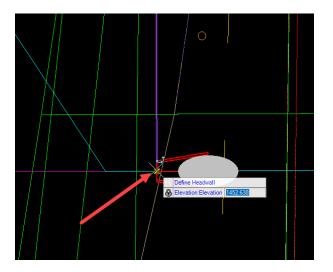
Once the settings are completed, it will prompt to select Reference for Node Elevation or <Reset> to type an Elevation.



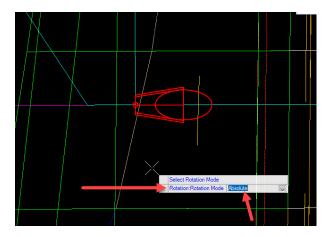
Reset with the mouse. Then the apron appears at the end of the cursor.



Next, snap to invert location that was mapped with the smart lines.



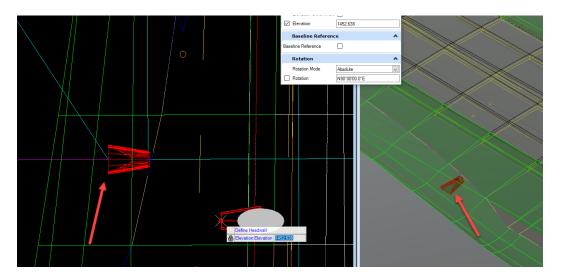
Then, it will prompt for the method to use to rotate. Select Absolute.



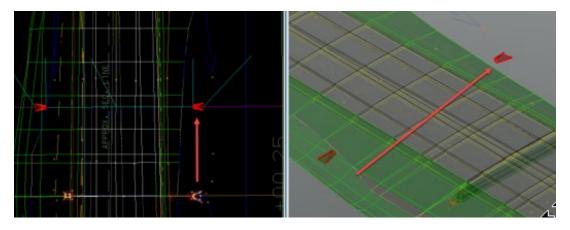
Next, rotate the apron to the smart line that represents the end of the apron.



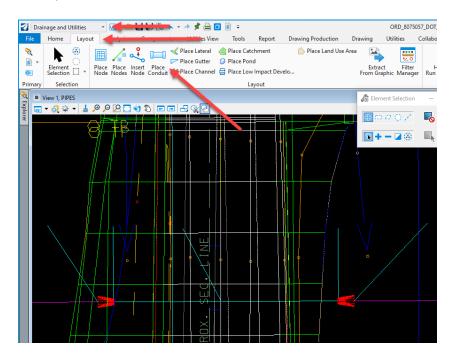
Data point to accept the rotation then DU will place the apron in the 2D and 3D model. It should look something like this:



Hit the Esc key to exit the command. Next, repeat the process on the other end of the pipe to place the other apron.



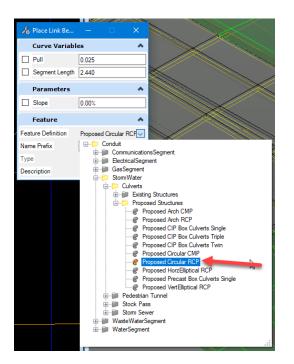
Once both aprons are placed, the pipe can be placed. To do this, use the Place Conduit tool located on the Layout tab.



It will open the Place Link Between dialog box. Set the Feature Definition and Name Prefix and Description as Size of pipe.

🔏 Place Link Be	. – 🗆 X
Curve Varial	oles 🔺
Pull	0.025
Segment Lengt	h 2.440
Parameters	*
Slope	0.00%
Feature	*
Feature Definition	Proposed Circular RCF 🗸
Name Prefix	P_RCP
Туре	Conduit Catalog
Description	30'' 🗸

For this example, place a 24" DR-601 RCP by picking the Proposed Circular RCP feature.

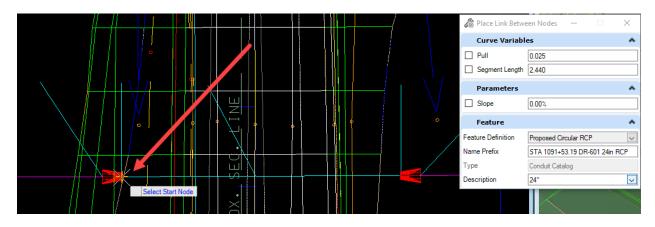


Next, place the Name Prefix. This will be a part of the description from the ASCII input file. It will consist of the Station, standard and description.

🔏 Place Link Betwe	een Nodes — 🗆 🗙
Curve Variabl	es 🔺
Pull	0.025
Segment Length	2.440
Parameters	*
Slope	0.00%
Feature	*
Feature Definition	Proposed Circular RCP 🗸
Name Prefix	STA 1091+53.19 DR-601 24in RCP
Туре	duit Catalog
Description	[4 "

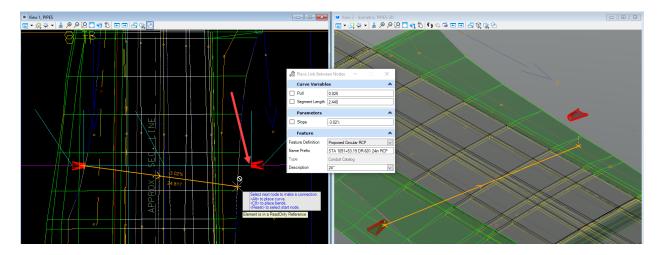
Next, Set Description as Size of pipe.

🔏 Place Link Betwo	een Nodes — 🗆 X
Curve Variabl	es 🔺
Pull	0.025
Segment Length	2.440
Parameters	*
Slope	0.00%
Feature	^
Feature Definition	Proposed Circular RCP 🔍
Name Prefix	STA 1091+53.19 DR-601 24in RCP
Туре	Conduit Catalog
Description	24"



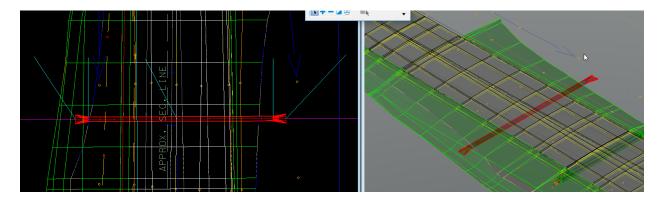
Then in the 2D window, find the inlet apron and select it as the Start Node.

Then select the outlet to complete the pipe.



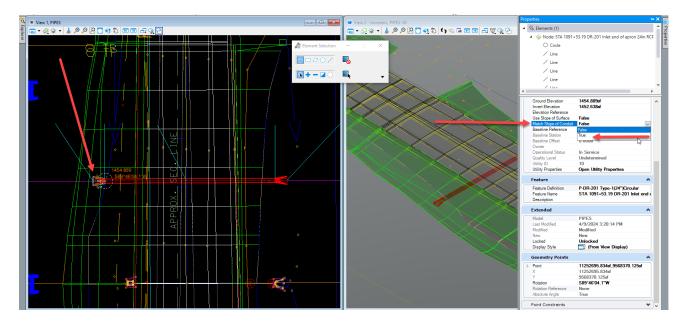
It will model the pipe in the 2D and 3d model at the same time.

When done, it should look something like this:



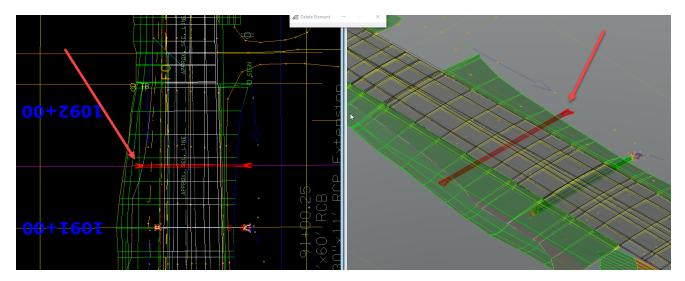
The last step in modeling the pipe is to set the aprons to Match Slope of Conduit. To do this, select the 2D apron node in the 2D model and open the Properties window. Then set the Match Slope of Conduit

field to True. Complete for each end of the pipe. This will rotate the apron to match the pipe in elevation.

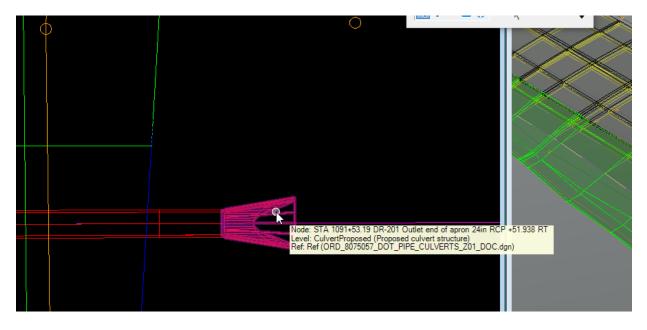


Once the pipe is modeled correctly, delete the smart line created to model the pipe.

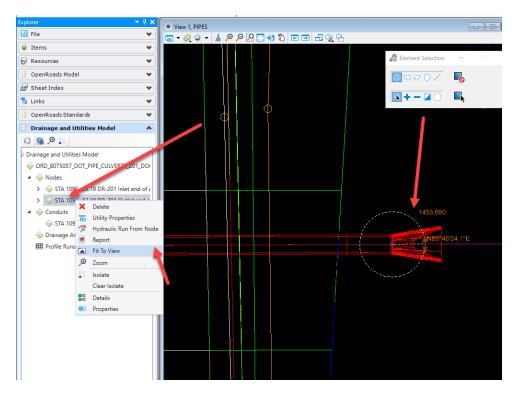
It should look like this:



The advantage of entering the proper Name Prefix is that when hovered over the pipe or aprons will display the Name Prefix making it easier to use the file.



Also, when changes to any of the pipes are required, access the pipe information thru the Explorer tool. It is more efficient to find pipes in large corridor projects by selecting the item in Explorer then right clicking and selecting Fit To View. This will zoom the view to that item.



Continue to the cross section creation. <u>PW04 Making Pipe X-section Sheets</u>

Making Pipe X-Section Sheets

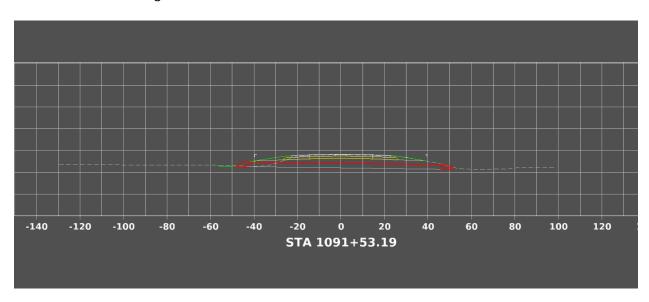
These instructions were created April 2024. These instructions were created with:



OpenRoads Designer CE - 2022 Release 3 Update 12 Version 10.12.02.4

This product is licensed to:

Now that the pipes are modeled in the pipe model file (as covered in the <u>PW03_Modeling Pipes in</u> <u>connect</u>), open the SHT file under the parenthesis folder that applies to this design. For this example, it will be SHT_8075057_DOT_PIPE_CULVERTS_Z01.dgn. Open the drawing model that was used to design the pipe in. The 3D pipe from the model file should be visible in the cross section now.



It should look something like this:

The next step is to annotate the cross section. This is where the ASCII input file is very helpful. Use the information in this file to copy and paste for labeling the key parts of the pipe that need to be annotated.

The key annotations are:

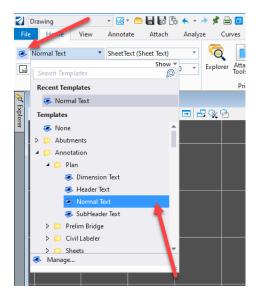
- 1. Design Cover.
- 2. Profile Grade Elevation.
- 3. Distance from centerline right.
- 4. Distance from centerline left.
- 5. Total length of new construction
- 6. Flowline Elevation at each critical point in the pipe.
- 7. Clear zone (if it is needed).
- 8. Structure description and any other unique items that need to be called out.

Hint: Anything that is needed to be input into the database for the pipe design should be annotated.

The first thing to do is to delete the pipe apron templates that were used to determine the elevations and offsets of the key points in the design. These are no longer needed since the pipe is modeled.

Hint: It is recommended to leave them in place until the pipe is modeled to verify that the pipe model matches the design. For this example they match.

Next, select the correct element template to place the annotations on. Use the Normal Text template.

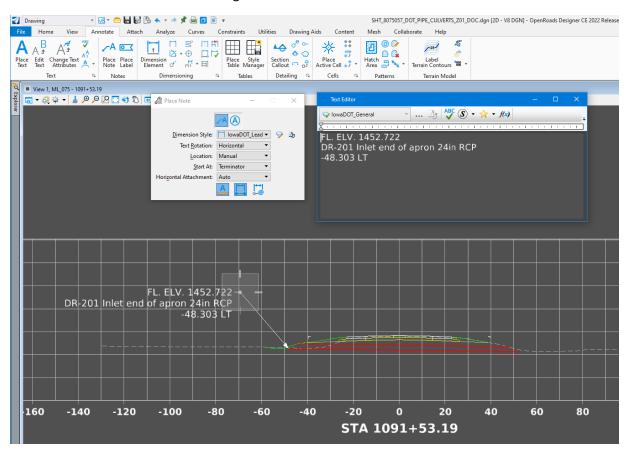


- 1. Select the Place Note tool.
- 2. Set the Dimension Style to IowaDOT_Leader_Note.
- 3. Type the note that needs placed. This is where the ASCII input file is very helpful using copy and paste for the note.

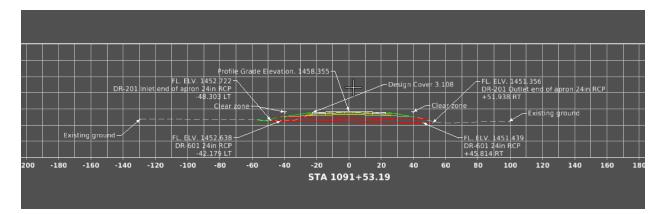
🌠 Drawing 🔹 🚾 📥 🛃 🕼 🐟 🔹 🧈 🏂 🙆 🖹 📼	SHT_8075057_DOT_PIPE_CULVERTS_Z01_DOC.dgn [2D - V8 DGN] - OpenRoads Designer CE 2022 Release
File Home View Annotate Attach Analyze Curves Constraints Utilities Drawing Aids Content	Mesh Collaborate Help
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	
Text 🖬 Notes Dimensioning 🛱 Tables Detailing 🗟 Cells 🛱	Patterns Terrain Model
Image: Solution of the state of t	General 🔹 🕞 🐥 🐼 🔸 🛠 🕈 🖋
Dimension Style: ☐ IowaDOT_Lead ♥ ♀ ⊉y Text <u>R</u> otation: Horizontal ♥ Location: Manual ♥ Start At: Terminator ♥	
Horizontal Attachment: Auto	

Place the notes in the proper locations.

The annotation should look something like this:

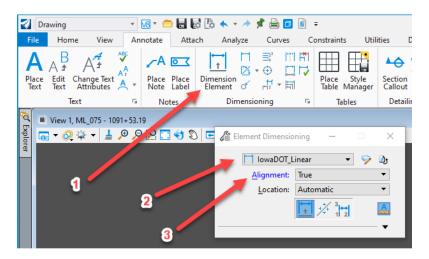


Once all the notes have been placed it should look something like this:



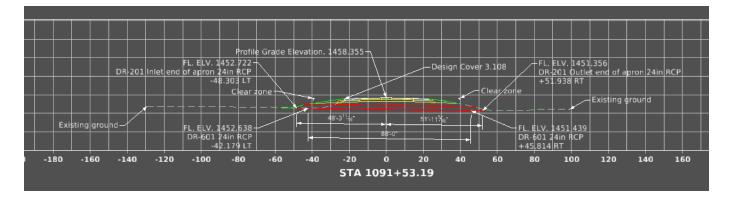
Next, place additional distance annotations.

- 1. Select the Dimension Element tool.
- 2. Set the Dimension Style to IowaDOT_Linear.
- 3. Set Alignment to True



Then place the Distance from centerline right, Distance from centerline left, and Total length of new construction.

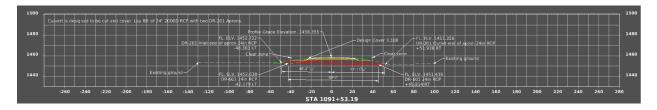
It should look something like this:



Last is to place the structure description and any other unique items that need to be called out. It is recommended to use the same note that is placed in the database that was typed earlier in the ASCII input file. For this example, it is "Culvert is designed to be cut and cover. Lay 88' of 24" 2000D RCP with two DR-201 Aprons."

To place this, use the Place Text tool.

It will look something like this:



Once all the pipes are modeled in the ORD file and annotated in the SHT file, the files are finally ready to make sheets in the SHT file.

The model dialog box should look something like this:

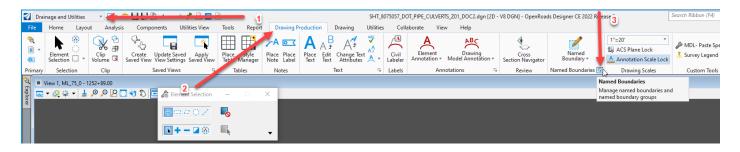
🗇 Mo						—		\times
4 6) 🗊 (💾 🔲 🌱 🗙						
Туре	2D/3D	Name	Description	*	Design File			
0 1		PIPES	Road Pipes	√	c:\pw_work\pwma\SHT_8075057_DO	_PIPE_CI	ULVERTS	_Z01_D
i i	Ĩ	STR info	Pipe and Culvert info 3D	√	c:\pw_work\pwma\SHT_8075057_DO	_PIPE_CI	ULVERTS	_Z01_0
i	Ĩ	PIPES-3D		×	c:\pw_work\pwma\SHT_8075057_DO	_PIPE_CI	ULVERTS	_Z01_I
		SR_340th - 453+55.09			c:\pw_work\pwma\SHT_8075057_DO	_PIPE_CI	ULVERTS	_Z01_I
		SR_370th_E - 426+30.00			c:\pw_work\pwma\SHT_8075057_DO	_PIPE_CI	ULVERTS	_Z01_I
		SR_370th_W - 425+05.00			c:\pw_work\pwma\SHT_8075057_D0	_PIPE_CI	ULVERTS	_Z01_I
		SR_360th_E - 439+40.00			c:\pw_work\pwma\SHT_8075057_D0	_PIPE_CI	ULVERTS	_Z01_I
		ML_75_0 - 1100+88.00			c:\pw_work\pwma\SHT_8075057_D0	_PIPE_CI	ULVERTS	_Z01_I
		ML_75_0 - 1112+80.00			c:\pw_work\pwma\SHT_8075057_D0	_PIPE_CI	ULVERTS	_Z01_
		ML_75_0 - 1141+70.70			c:\pw_work\pwma\SHT_8075057_DO	_PIPE_C	ULVERTS	_Z01_
		ML_75_0 - 1164+45.00			c:\pw_work\pwma\SHT_8075057_DO	_PIPE_CI	ULVERTS	_Z01_
		ML_75_0 - 1174+46.00			c:\pw_work\pwma\SHT_8075057_DO	_PIPE_CI	ULVERTS	_Z01_
		ML_75_0 - 1194+10.00			c:\pw_work\pwma\SHT_8075057_DO	PIPE_C	ULVERTS	_Z01_
		ML_75_0 - 1207+75.00			c:\pw_work\pwma\SHT_8075057_DO	_PIPE_CI	ULVERTS	_Z01_I
		ML_75_0 - 1212+55.00			c:\pw_work\pwma\SHT_8075057_DO	PIPE_C	ULVERTS	_Z01_I
		ML_75_0 - 1212+62.00			c:\pw_work\pwma\SHT_8075057_DO	_PIPE_CI	ULVERTS	_Z01_
		ML_75_0 - 1222+88.00			c:\pw_work\pwma\SHT_8075057_DO	_PIPE_CI	ULVERTS	_Z01_
		ML_75_0 - 1252+75.00			c:\pw_work\pwma\SHT_8075057_DO	_PIPE_CI	ULVERTS	_Z01_I
		ML_75_0 - 1252+89.00			c:\pw_work\pwma\SHT_8075057_DO	PIPE_C	ULVERTS	_Z01_I
		ML_75_0 - 1260+94.00			c:\pw_work\pwma\SHT_8075057_DO	_PIPE_CI	ULVERTS	_Z01_I
		ML_75_0 - 1261+04.00			c:\pw_work\pwma\SHT_8075057_DO	PIPE_C	ULVERTS	_Z01_I
		ML_75_0 - 1273+21.99			c:\pw_work\pwma\SHT_8075057_DOT	_PIPE_CI	ULVERTS	_Z01_I
		ML_75_0 - 1297+40.00			c:\pw_work\pwma\SHT_8075057_DO	_PIPE_CI	ULVERTS	_Z01_I
		ML_75_0 - 1308+50.00			c:\pw_work\pwma\SHT_8075057_DO	_PIPE_CI	ULVERTS	_Z01_I
		ML_75_0 - 1320+38.00			c:\pw_work\pwma\SHT_8075057_DO	_PIPE_CI	ULVERTS	_Z01_[
C								

There should be a drawing model for each cross section that represents each pipe location.

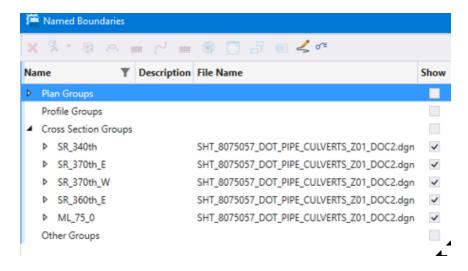
Note: Suggestion to not complete this step until confident that the pipe designs are complete.

Now, make some sheets.

- 1. Set the workflow to Drainage and Utilities.
- 2. Click on the Drawing Production tab .
- 3. Click on the Manage named boundaries and name boundary groups.

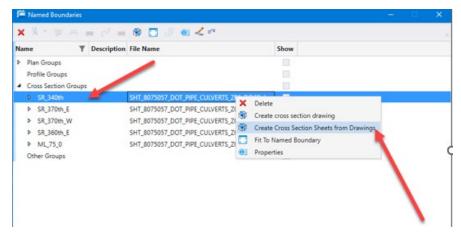


These steps will open the Named Boundaries list:



Note: This is where making the cross sections from the correct alignments and having used the correct cross section groups really pays off.

Select one of the groups and right click and select the Create Cross Sections Sheets from Drawings option.



This will make the cross-section sheets for each alignment and stack then in order of the station value. The reason to make the sheets at the end is if there is a need to remove, add or cut new sections in the design process, it will still stack the cross sections correctly based on alignment and station.

The last step to finish the sheets will be covered in the next chapter. <u>PW05</u> Placing Pipe X-section Sheets into Sheet Index File

Placing Pipe X-section Sheets into Sheet Index File

These instructions were created April 2024. These instructions were created with:



OpenRoads Designer CE - 2022 Release 3 Update 12 Version 10.12.02.4

This product is licensed to:

When creating sheet files, the sheet border information will have text fields that are set up to work with the **IaDOT_WS.dgnws** Sheet Index file. This file is in the **ProjectResources\Workset** folder of every Bridge Project Directory. The IaDOT_WS.dgnws Sheet Index file is specific to each WorkArea that it resides in. The Sheet Models are added to the Sheet Index to autofill the text fields. To do this, access the Sheet Index thru the Project Explorer.

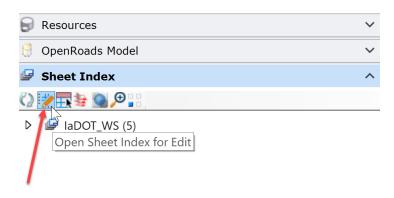
Note: The Sheet Index can only be edited by one User at a time. Also keep in mind, that the index file will be used by anyone making sheets in that directory.



Project Explorer displays the Sheet Index as shown below:

Explorer	- 4 ×
🔀 File	~
💊 Items	~
🗑 Resources	~
🔋 OpenRoads Model	~
🕼 Sheet Index	^
🗘 👷 🔜 🔎 🔐	
▷ 🕼 IaDOT_WS (5)	
6	
E Links	~
OpenRoads Standards	~
Drainage and Utilities Model	~
Survey	~

Open the Sheet Index for editing, click on the Open Sheet Index for Edit 💹 button.

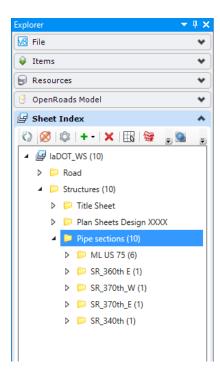


Next, add the folders that the sheets will reside in. Typically, the process is to create a folder for the Pipe sections. Then make subfolders for each cross-section group, alignment.

To add a folder, click on the Structures folder to highlight then click on the create folder $\stackrel{\bullet\bullet\bullet}{\longrightarrow}$ button. Select New Folder.



Once all the folders needed are added it should look something like this:

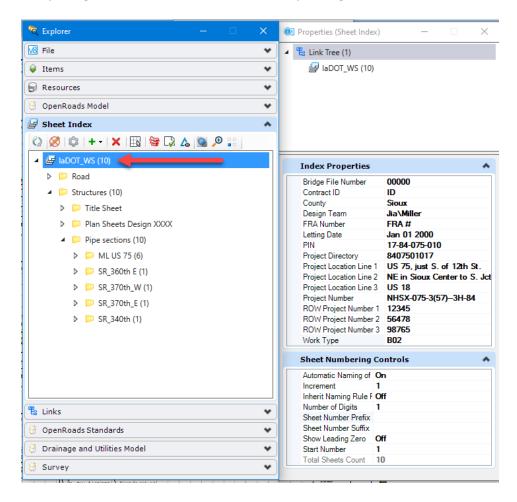


Next, set the Index Properties at the index level. Click on the **IaDOT_WS** in the Sheet Index Explorer to highlight and open the Properties window.

Edit the following text fields:

- Bridge File Number
- County
- Design Team (e.g., Iowa DOT or Consultant Name)
- PIN#
- Project Directory
- Project Location line 1,2,3
- Project Number
- Work Type

Completing these values will fill out the corresponding text fields in the Border.

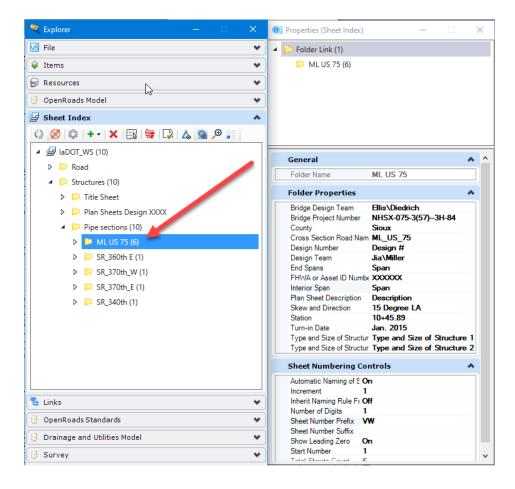


Next, set the text fields that are cross section specific for each cross-section group. To do this, select the folder created earlier for each cross section group in Project Explorer to highlight and open the Folder Properties.

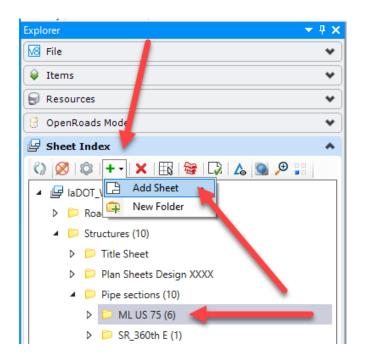
Edit the following text fields:

- Bridge Design Team
- Bridge Project Number
- County
- Cross Section Road Name
- Design Team (e.g., Iowa DOT or Consultant Name)
- Sheet Number Prefix

Note: The Mainline sheets number prefix are set as VW sheet number prefix. Sideroads sheets are set as VX sheet number prefix only if one sideroad is in the project. If multiple sideroads are in a project, then the first sideroad of the project will have a sheet number prefix VX1, then VX2 and so on thru the project. If interchange ramp sheets are made the sheet number prefix for them are VY.



Once the folders are created for the cross-section groups, then add the sheets to the correct folders. Select the folder that the sheet will reside in and click on the Add Sheet button.



The Add Sheet dialog box will open. Browse to select the DGN file that the sheet is in.

ct		
Documents		
Folder 10 (61)_Preliminary Engineering	~ <	• 🔰 👬 🚟 [
A R		~
Name	Description	Out to
Enter text here	Y Enter text here	🍸 Entert
CC-RRRS-PPP Review		
CC-RRRS-PPP_Shop Drawings		
DOT ProjectResources		
Sketches		
XVZ-CORP		
/ 📷 SHT_86063060_0127_900640_CIP_Z05.dgn	12X8 RCB extend outlet CIP	
25.dgn SHT_86063060_0127_900640_PC_Z05.dgn	12X8 RCB extend outlet Precas	t
/ 🔐 SHT_86063060_ 0327_900645_CIP_Z05.dgn	8X5 RCB extend inlet CIP	
Image: SHT_86063060_0327_900645_PC_Z05.dgn Image: SHT_86063060_DOT_PIPE_CULVERTS_Z05.dgn	8X5 RCB extend inlet Precast Pipe X Section sheets	
THE SHI 80063060_DOT_PIPE_CULVERIS_205.dgn	Pipe X Section sheets	
	La	
<		
Application: All Applications		
Application. All Applications		
bhA	Remove	
Add Selected Dog ments	Remove	
Selected Documents		
Selected Documents Name	Description 0	ut to
Selected Documents	Description 0	ut to hter text 🍸 Enter
Selected Documents Name	Description 0	
Selected Documents Name	Description 0	
Selected Documents Name	Description 0	
Selected Documents Name	Description 0	
Selected Documents Name	Description 0	
Selected Documents Name	Description 0	
Selected Documents Name	Description 0	
Selected Documents Name	Description 0	
Selected Documents Name	Description 0	
Selected Documents Name	Description 0	
Selected Documents Name	Description 0	
elected Documents	Description 0	

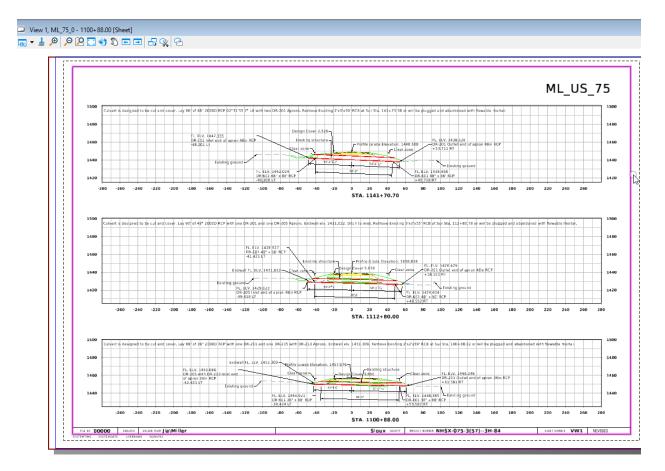
Click the Add button. Then click the OK button.

A list of available sheets will display. Select the sheet that will reside in the cross section folder selected. **Note:** The Add Sheet list will only show Sheet Models that are not part of any Sheet Index. A Sheet Model is only allowed to be assigned to one Sheet Index, not multiple indexes. If the sheet needed is not listed make sure it is not allready in another index.

Add Sheet	×
🔺 🚾 c:\pw_work\pwmain\ediedri\d10906	50\OR
🕒 STA 1774+79.60 [Sheet]	
	Ļ

Once the sheet models have been added to each of the folders, then check the sheets for any errors. If all text fields and sheets look good, then check in the sheet index and print.

It sould look something like this:



To print the cross-section sheets, click on the Open Print Organizer tool located at the top of the Sheet Index.

Explorer	→ ₽ ×	View 1, ML_075 - 1091+5
😡 File	*	
😝 Items	*	
😝 Resources	*	
🔮 OpenRoads Model	*	
🔄 Sheet Index	*	
 Image: A state of the state of		
		1500 - Culvert is de

It will open this Select Print Style dialog box. Select the CLR_overrides_ColorRaster print style. Then click OK.

Select Print Style		×
Print Style Name PDF Printer BW_pdf_SheetModel CLR_as_is_pdf_SheetModel CLR_overrides_ColorRast CLR_overrides_pdf_Sheet CLR_overrides_SmallRast	lowaDOT_PrintStyles.dgnlib lowaDOT_PrintStyles.dgnlib	
	OK Cancel	

Next, it will open the Print Organizer. Select the parent folder to the sheets that are needed to print. For this example, it is the Pipe sections folder.

📢 IaDOT_WS.pset - Print Organizer				—	□ ×
File Edit View Tools					
i 📮 🚍 🔒 🚔 🖓 📪 🗞 :	X 01 🔼 🔨 🗙	✓ ⊻ 🖽 • 🛱	J		
IaDOT_WS → Road → Structures Title Sheet → Plan Sheets Design XXXX → Fire sections → -D ML US 75 → SR_360th E → SR_370th_W → SR_370th_E → SR_340th	Name ML US 75 SR_370h E SR_370h_W SR_370h_E SR_340h	File Name	Model	Print Style	View Group
	<				>
		e	11x17_pdf_Color_R	aster.pltcfg 5 iten	ns (0 selected)

Click on the print tool at the top of the Print Organizer.

			•	,	
laDOT_WS.pset - Print Organizer				-	- 🗆 X
File Edit View Tools					
📮 🚍 🔚 🖳 🗣 🖙 🗞	X 🛯 🔁 🔨 🗙	✓ ⊻ 🗄 • 🛱	P		
 IaDOT_WS Road Structures Plan Sheets Denon XXXX Plan Sheets Denon XXXX SR_300h E SR_370h_W SR_370h_E SR_370h_E SR_340h 	Name ML US 75 SR 360h E SR 370h-W SR 370h_E SR 370h_E	File Name	Model	Print Style	View Group
	<				>
			11x17 pdf Color R	aster.pltcfg 5	items (0 selected)

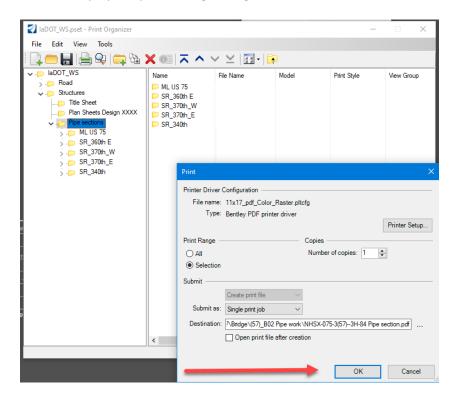
Value - Print Organizer					
File Edit View Tools					
					_
	X 01 🔼 🔨 '	✓ ≚ 🔛 • [1		
	Name MLUS 75 SR_360th E SR_370th_W SR_370th_E SR_370th_E SR_340th	File Name	Model	Print Style	View Group
> p SR_370th_E	Print				×
, .⊫ SR_340th	Print				^
	Printer Dri	ver Configuration —			
		me: 11x17_pdf_Color			
	را	/pe: Bentley PDF prin	ter driver		
F					Printer Setup
	Print Rang	e	Сорі		
			Nur	mber of copies: 1	-
	Select	tion			
	Submit -				
		Create print file	\sim		
	Submit	as: Single print job	~		
	Destinat	ion: rojects\84075010	017\Bridge\(57) E	02 Pipe work \out \\la[OT WS.pdf
1	<	Open print file			
	×				1
				ОК	Cancel

It will open the print dialog box. Click on the three dots at the end of the Destination.

It will open the Save Output File dialog box. Name it with the project number and pipe sections Complete the description as Pipe x sections and set the format to pdf. Then click Save.

🛃 IaDOT_WS.pset - Print Organ	nizer				-	• ×
File Edit View Tools						
: 📮 📛 💾 😫 🗣 i 🖕	📮 🔁 🗙 💷	~ ^	∨ ⊻ <u>⊡</u> • [P		
	Name ▷ ML U ▷ SR_ ▷ SR_ ▷ SR_ ▷ SR_	360th E 370th_W 370th_E	File Name	Model	Print Style	View Group
SR_370th_W	Save Output File		-			×
5	General					×
	Folder				Sa	ve
	(57)_B02 Pip	e work		Select	Can	ncel
	Document				Cu	
	Name:	NHSX-075-3	(57)3H-84 Pipe sectio	on.pdf	-	Setup
	Description:	Pipe x Sectio	ons 🧹			
	File Name:	NHSX-075-3	(57)3H-84 Pipe sectio	on.pdf		
	Format:	pdf		Format		
	Application:		Department:		_	
	Acrobat PDF		<none></none>		~	#
	<			e atter creation		
					ОK	Cancel
					UK.	Cancel

This will display the print dialog box again. Then click OK.

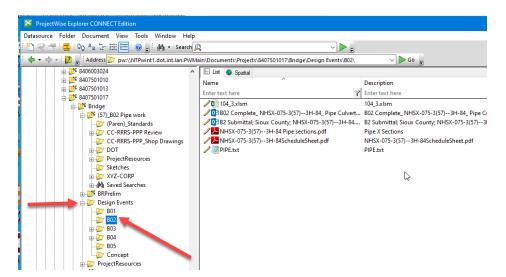


Once it is done making the pdf, it should appear in the same directory that the SHT file resides in.

ProjectWise Explorer CONNECT Edition	
Datasource Folder Document View Tools Window Help	
🕴 🎦 😪 😤 🛯 🚭 🕒 🖕 🖫 🚟 🧮 🎯 🖕 🕅 🔸 Search 🚛	ب 🗸 🗸 🗸
🕴 💠 👻 🚽 🚺 🛫 🗄 Address 🖊 pw:\\NTPwint1.dot.int.lan:PWMa	in\Documents\Projects\8407501017\Bridge\(57)_B02 Pipe work\NHSX-075-3(! ∨ 🕨 Go 🖕
	Lat ● Spatial Name Description Enter text here Enter text here () Enter text here () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () ()

Review the file to make sure it is correct.

Move it to the Design Events subfolder under B02.



This is the subfolder location for the finished ASCII input file and Schedule Sheet that will be created from the pipe database. This will be covered in <u>PW06_Entering Pipe and Structure Information into the Access Database</u>

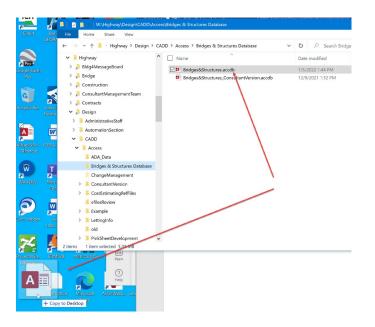
Entering Pipe and Structure Information into Database

Once the cross sections are cut on each pipe culvert and have been annotated as described in <u>PW04_Making Pipe X-section Sheets</u> or <u>CW06_How to Create Culvert TSL Sheet and Annotate the</u> <u>Structures</u>, then input the annotated information in the Bridges&Structures.accdb.

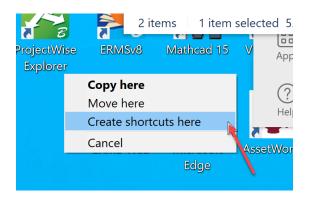
There are two ways this can be done. The first way is intended for internal Iowa DOT employees and the other way is for outside employees or consultant projects.

How to get started for internal Iowa DOT employees is covered first.

First place a short cut of the Bridges&Structures.accdb database on to the desktop. Open a Windows file explorer and browse to W:\Highway\Design\CADD\Access\<u>Bridges & Structures Database</u>. Select the <u>Bridges&Structures.accdb</u> and right click and drag to the desktop.



Then select Create shortcuts here.



Note: By making a short cut, the system administrators can make changes to the database, and it will always open the latest version.

The second way to use the Bridges&Structures.accdb is intended for outside employees or consultant projects. A different consultant version of the database is located in ProjectWise at: pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Resources\ClientWorkspaces\lowaDOT\lowaDOTProd uction\Organization-

Civil\lowaDOT_Standards\Seed\<u>Access</u>\Bridges&Structures_ConsultantVersion.accdb.

This file should be copied to a local work directory then renamed to Bridges&Structures_CCRRRPPP.accdb. This is because Access does not work properly in ProjectWise.

Once the data entry is completed in this database, it should be placed in the project directory that it corresponds with.

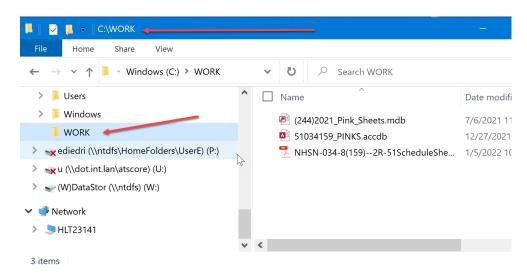
Now that the correct database for both internal and external users has been explained, open it and get started with data entry. The welcome screen appears as shown below.

	ي ج ، ج	≠ Bridg	es&Structures : Datab	ase- W:\Highway\D	Design\CADD	Access	\Brid	Diedric	n, Eric	\sim	9^	×
File	Home	Create	External Data	Database Tools	Help	Q	Tell me w	/hat you v	want to d	0		
0	READ-ONLY		se has been opened re ges, save a copy of th		nly change c	lata in li	nked tables	. To make		Save As		×
	И	/elcome	ediedri to the	Bridge and	<u>Culvert</u>	<u>Sche</u>	dule Do	<u>itabas</u>	<u>e</u>			
			Enter Database	2	Ex	it Data	ıbase					
)												(

It will display a warning that it is READ-ONLY. Don't be concerned, this is normal. This is indicating that the database design can't be changed. However, the data entry will be stored in a table that is read by this database. Click on the X to close the warning.

	This database	has been onened	Database Tools read-only. ^{In} iou can on	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		dea -
		es, save a copy of t		ny change outain	inded lables. To the	Save As
We	elcome e	ediedri to the	e Bridge and (Culvert Sch	edule Databo	ase
		Enter Databas		Exit Da	tabaca	
		Enter Databas	e	EXILDU	abuse	

The next step is to make a working directory on the local C:\ drive. For this example, a folder named WORK was created.



Next, change a few security settings in Access to avoid seeing the warning shown below when the survey information is imported.

f	Microsof	t Access Security N	lotice	? ×	
e		A potential security	concern has be	een identified	1. [.] 01
i 5	content of leave this	It is not possible to ame from a trustwo s content disabled u Inctionality and you	orthy source. Y Inless the conte	ou should ent provides	ur C
	File Path:	C:\WORK\5103415	9_PINKS.accdb		
		iight contain unsafe c . Do you want to ope ?		-	
	<u>More info</u>	<u>rmation</u>			si
			Open	Cancel] ;

Click on the File menu at the top of the database.

-		• Bridg	es&Structures : Datab	ase- W:\Highway\De	esign\CADD	Access\Bridges &	Structures Database\Br
File	Home	Create	External Data	Database Tools	Help		/hat you want to do
	We	elcome	ediedri to the			<mark>Schedule Do</mark> t Database	<u>atabase</u>

This will open the backstage to access Options. Click on Options to open the Access Options dialog box.

Bridges&Structures : Database- W:\High
Good morning
✓ New
Blank database
🔎 Search
Recent Pinned
🗅 Name
Bridges&Structures W: » Highwar » Design
Bridges&Structures W: » highway » Design
W: » Highway » Design
IN PROGRESS Bridg W: » Highway » Design
Bridges&Structures C: » Project Work Dir » E
Seed_Pink_Sheets.n

General Image: Current Database Current Database User Interface options Database Disable tive Proview® Decoding Enable Live Proview® Screen Tigs Screen Tigs Client Settings Osable hardware graphics acceleration Current Robion Osable hardware graphics acceleration Current Robion Creating database Add-ins Creating databases Trust Center Dealuf file format for Blank Database: <a>Currently Personalize your copy of Microsoft Office User name: Lister name: Dieduit file format for graphics of sign in to Office. Office Therme: Colorful w					
Datasheet User Interface options Object Designers Image in the proview in the second time descriptions in Screen Tips in the second time is the second time in the second time in the second time in the second time is the second time is the second time is the second time in the second time is the second time in the second time is the second tim time is the second time is the se	General opti	ons for working	with Access.		
Troofing ScreenTip style: Show feature descriptions in ScreenTips anguage StorenTips Cilent Settings Disable hardware graphics acceleration Customize Ribbon Creating databases Lastomize Ribbon Creating databases Default file format for Blank Database: Access 2007 - 2016 * Default file format for Blank Database: Creating database folder: Customize Ribbon Creating database folder: Md-ins Default file format for Blank Database: Prust Center New database folder: Customize Ribbon General - Legacy Personalize your copy of Microsoft Office User name: User name: Diedrich, Eric Initials: DE Colligraphy *	User Interface optio	ns			
Language Show shortcut keys in ScreenTips Clent Settings Disable hardware graphics acceleration Custonize Ribbon Creating databases Daidk Access Toolbar Default file format for Blank Database: Access 2007 - 2016 * Default file format for Blank Database: Access 2007 - 2016 * Browse. Default file format for Blank Database: Access 2007 - 2016 * Browse. Default file format for Blank Database: Access 2007 - 2016 * Browse. Personalize your copy of Microsoft Office Browse. Les name: Diedrich, Eric Initials: DE Office Background: Calligraphy *	Enable Live Prev	iew 🛈			
Ilem Settings Disable hardware graphics acceleration Castomize Ribbon Creating databases Database Toolbar Default file format for Blank Database: Access 2007 - 2016 • Default database folder: C\Users\rediedin\Documents\ Browse: New database folder: Customize Ribbon Browse: Udd ins Default database folder: Customize Ribbon Browse: Personalize your copy of Microsoft Office User name: Diedrich, Eric Initial:: DE Office Background: Calligraphy	ScreenTip style: S	how feature desci	iptions in ScreenTips 👻		
Deckut Ring Creating databases Duick Access Toolbar Deckut file format for Blank Database: Access 2007 - 2016 • Add-ins Default database folder: C\Uber\ediedr\Documents\ Trust Center New database folder: C\Uber\ediedr\Documents\ Personalize your copy of Microsoft Office User name: Diedrich, Eric Initial:: De Office Background: Calligraphy •	Show shorter	ut keys in ScreenT	ps		
Dauk Access Toolbar Default file format for Blank Database: Access 2007-2016 • Add-ins Default file format for Blank Database: C4Cess 2007-2016 • Default file format for Blank Database: C4Cess 2007-2016 • Personalize your copy of Microsoft Office Browse User name: Diedrich, Eric Initial: Default sergardless of sign in to Office. Office Background: Caligraphy	Disable hardwar	e graphics acceler	ation		
Add-ins Default file format for Blank Database: Access 2007 - 2016 • Instance Default database folder: C\User\rediedin\Documents\ Browse. Instance New database sort order: General - Legacy • Personalize your copy of Microsoft Office User name: Diredrich, Eric Initials: DE	Creating databases				
Trust Center Default database joid off: C_\Usersyndeden/Uocuments\ Browse. New database gort order: General - Legacy * Personalize your copy of Microsoft Office User name: Diedrich, Eric Initialize: DE	Default file format fo	or Blank Database	Access 2007 - 2016 👻		
New database gort order: General - Legacy Personalize your copy of Microsoft Office User name: Diedrich, Eric Initials: DE Okayay use these values regardless of sign in to Office. Office Background: Caligraphy	Default database fo	Ider: C:\U	ers\ediedri\Documents\	Bro	owse
Personalize your copy of Microsoft Office Liser name: Diedrich, Eric Initiale: DE	New database sort	ordec	General - Lenacy	*	
User name: Diedrich, Eric Initials: DE Always use these values regardless of sign in to Office. Office Background: Calligraphy •	Personalize your cor	ov of Microsoft C	ffice		
Initials: DE Always use these values regardless of sign in to Office. Office Background: Calligraphy					
Always use these values regardless of sign in to Office. Office Background: Calligraphy *					
Office Background: Calligraphy •			of sign in to Office.		
	onice internet	oorondi .			
		User Interface option Screen Tip style: S Stown thorac basels hardwar Creating databases Default file format fi Default database for New database sort of Personalize your cop User name: Initia: Away use thes Office Background:	User Interface options ♥ Enable Live Preview® Screen Tip style: Show feature descr ♥ Show shortcut keys in Screen Ti ■ Disable hardware graphics acceler: Creating databases Default falle format for Blank Database: Default database folder: CUS New database soft order: Personalize your copy of Microsoft O Liser name: Diedrich, Eric Initials: DE Manyu use these values regardlers Office Background; Calligraphy	User Interface options	User Interface options

Next, click on the Trust Center option and then click on the Trust Center Settings button.

Access Options		? ×
General Current Database	Help keep your documents safe and your computer secure and healthy.	
Datasheet	Security & more	
Object Designers Proofing	Visit Office.com to learn more about protecting your privacy and security.	
Language	Microsoft Trust Center	
Client Settings	Microsoft Access Trust Center	
Customize Ribbon Quick Access Toolbar Add-ins Trust Center	The Trust Center contains security and privacy settings. These settings help keep your computer secure. We recommend that you do not change these settings.	Irust Center Settings
-		OK Cancel

That will open the Trust Center dialog box. Click on the Add new location button.

Trust Center	?	×
Trusted Publishers	Trusted Locations	
Trusted Locations	Husted Educations	
Trusted Documents	Warning: All these locations are treated as trusted sources for opening files. If you change or add a location, ma sure that the new location is secure.	⊧ke
Trusted Add-in Catalogs	Path Description Date Modifie	ed 🔻
Add-ins	User Locations C:\)\Microsoft Office\Root\Office16\ACCWIZ\ Access default location: Wizard Databases	
ActiveX Settings		
Macro Settings	Policy Locations	
Message Bar		
Privacy Options		
	Path: C:\Program Files (x86)\Microsoft Office\Root\Office16\ACCWIZ\	
	Description: Access default location: Wizard Databases	
	Date Modified:	
	Sub Folders: Disallowed	
	Add new location <u>Remove</u> <u>Modif</u>	fy
	Allow Trusted Locations on my network (not recommended)	
	Disable all Trusted Locations	
	ОК Са	ancel

This will open the Trusted Location dialog box. Click the Browse button to navigate to the temporary work directory created to place the survey information in.

Microsoft Office Trusted Location	?	×
Warning: This location will be treated as a trusted source for opening file change or add a location, make sure that the new location is secure. Path:	s. If you	
C:\Program Files (x86)\Microsoft Office\Root\Office16\ACCWIZ\		
Subfolders of this location are also trusted Description:	Brov	vse
Date and Time Created: 12/27/2021 7:22 AM	Car	ncel

For this example, select the WORK folder that was created.

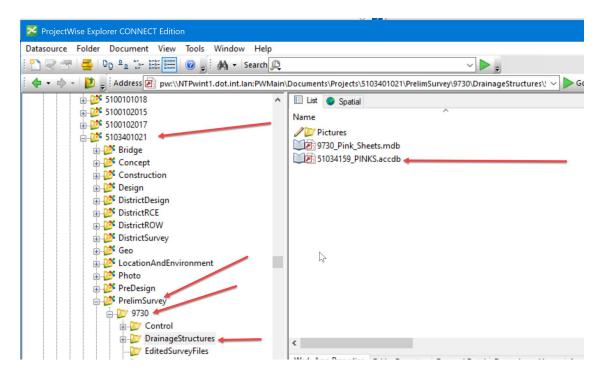
Microsoft Office Trusted Location	?	×
Warning: This I vation will be treated as a trusted source for opening file change or add a location, make sure that the new location is secure. Path:	es. If you	
C:\WORK		
Subfolders of this location are also trusted Description:	<u>B</u> row	vse
Date and Time Created: 12/27/2021 7:22 AM OK	Car	ncel

Then click OK.

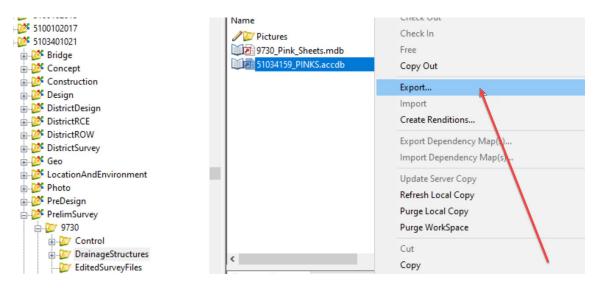
Note: if the same working directory is available and used for all projects, this will only need set once.

The next step is to check for the file to import the survey records for the project. The file is also a database that should be located in the project directory in the PrelimSurvey subfolder under the unique id number SAP folder in the DrainageStructures subfolder.

For example: PWMain\Documents\Projects\5103401021\PrelimSurvey\9730\DrainageStructures\ The file will be named CCRRRPPP_PINKS.accdb or for this example it will be 51034159_PINKS.accdb



Once the Survey Records are located, export to a local work directory. Select the file, right click and select the Export option.



When the Document Export Wizard opens, select the Send to Folder with unmanaged local copy option. Then click the Next button.

Document Export Wizard		×
	Welcome to the Document Export Wizard Choose an action tojgerform Export - Locks file, changes can be re-imported Send to Folder - Creates unmanaged local copy The Send to Folder option will download unmanaged local copies of the selected documents so they can be sent out for review.	
	< Back Next > Cancel	

Browse to the local WORK folder created earlier. Then click the Next button.

ocument Export Wizard		
Define the export sett Specify an export fold	ngs er and dick Next to begin the export.	
Export folder:		
C:\WORK		Browse
Export comment:	2	
Previous Comments:		
	< Back	Next > Cancel

A progress bar for exporting will display.

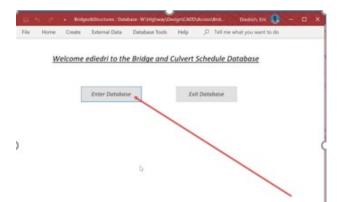


When it is finished, it will display a message indicating a successful export. Click on the Finish button.

Document Export Wizard	
Review document export results Review the information below about document export results.	
Document Export was successfully completed. Press Finish button to exit.	
I	/
< Back Finish	Cancel

Now return to the Bridges&Structures.accdb database.

The next step is to Create New Project File. Click on the Enter Database button.



The Main Menu will display.

File Home	Create	External Data	Database Tools	Help	9	Tell me what
		Main	Menu			
		= <u>Proj</u>	ect List			
		Survey	Records			
		/ Create New	w Project File			
		Export	to 104-3			
		Export Scl	hedule Sheet			
		 Exit D 	latabase			

		5· @·	≠ IN PR	OGRESS Bridges&St	ructures : Database- \	W:\Highway	\Design\		Diedrich, Eric		\leq		×
-	File	Home	Create	External Data	Database Tools	Help	Q	Tell me w	hat you want to	do			
				Main	Menu								
•				<u>■ Proj</u> e	ect List								
				<u>■Survey</u>	<u>Records</u>								
				Create Nev	v Project File 🛛 👉								
				Export	<u>to 104-3</u>								
				Export Sch	edule Sheet							[ß
				🖗 Exit D	atabase								
F	orm Vie	ew										Þ	2

Next, click on the Create New Project File button.

The data entry form will display as shown below.

Home Create Extern	al Data Database Tools	Help 🔎	Tell me what you want to do	
	<u>Create I</u>	Project File		
Project Number:		~	File No.	
Location			Pin No.	
Design Team			Station From	
Bridge Team			Station To	
Import Path				9,
A			TrafficCount	
В			VPD YR	
BW			VPD_TK	
С				
Z			Received	
E			ToDesign	
M			-	
T X			ToFinalDesign	
^ MW			NoDesigns	
CLEAR			NoPipes	
Road Typical			Designs	
Typical Date			5	
	<u>Save</u>	× <u>_Ca</u>	ncel	

The first step to start a new project is to import the Survey Records into the new project. Click on the magnifying glass next to the Import Path field.

Home Create E	xternal Data	Database Tools	Help		to do	
		<u>Create P</u>	roject I	lie		
Project Number:				 File No. 		
Location				Pin No.		
Design Team				Station From		
Bridge Team				Station To		
Import Path					<i>d</i>	
A				TrafficCount	1	
В						
BW				VPD_YR		
с						1
Z			R	Received		1
E				ToDesign		
М Т				-		
X				ToFinalDesign		
MW				NoDesigns		
CLEAR				NoPipes		
Road Typical				Designs		
Typical Date				Designs		1
		<u>■ Save</u>		× <u>Cancel</u>		

It will open a message to select the database. Click on the OK button.

Home Create Extern	al Data Database Tools Help 🔎 Tell me what you want to do
	<u>Create Project File</u>
Project Number:	 File No.
Location	Pin No.
Design Team	Station From
Bridge Team	Station To
Import Path	•
В	
C from. Z E	lect the pink sheet database you would like to import all records
C Please sel from. Z E M T	
C Please sel Z from. E M T X	
C Please set from. E M T X MW	ToFinalDesign
C Please sel from. Z E M T	ToFinalDesign
C Please sel from. Z F M T X MW CLEAR Road Typical	ToFinalDesign NoDesigns NoPipes

Next, browse to the location that was used to export the Survey Records to and select the CCRRRPPP_PINKS.sccdb file that corresponds with the project. For this example, it will be 51034159_PINKS.accdb in the C:\WORK folder.

👅 Please select a pink sheet database.			×
← → ∽ ↑ 🖡 - Windows (C:) → WORK	v Ū	✓ Search WORK	
Organize - New folder		-	□ 2
🣜 Windows	^	Name	
WORK -	-	51034159_PINKS.acc	db
🛶 ediedri (\\ntdfs\HomeFolders\UserE) (P:)			
u (\\dot.int.lan\atscore) (U:)			
🕪 (W)DataStor (\\ntdfs) (W:)			
Network			
	\checkmark		>
File name: 51034159_PINKS.accdb	~	Access Databases (*.accdl	b) ~
	Tools 🔻	ОК Са	ancel

Then click the OK button.

Next, set the project number.

Click on the pulldown in the Project Number field and find the project number from the list and select it. Otherwise, start typing the project number in the Project Number field and the number should autofill as it is typed. Select the correct number. For this example, the project number is NHSN-034-8(159)—2R-51. This will also autofill the PIN No. field once selected since these numbers are tied to each other. It should fill in as shown below.

Home Create	External Data	Database Tools	Help	Q	Tell me what you wa	ant to do		
		<u>Create P</u>	roject	File				
Project Number	: NHSN-034	-8(159)2R-51		~	File No.			
Location					Pin No.	21-51-034-010		
Design Team		I			Station From	1		
Bridge Team				$\overline{\}$	Station To			
Import Path C:	WORK\510341	59_PINKS.accdb				4		
A					TrafficCount		7	
В								
BW					VPD_YR			
С								
Z					Received			
E								
Μ					ToDesign			
Т					ToFinalDesign			
x					NoDesigns			
MW CLEAR								
CLEAR					NoPipes			
Road Typical					Designs			
Typical Date								
		<i>■<u>Save</u></i>		× <u>Car</u>	ncel			
/iew							1	

Next, fill out the Location field with the project description. For this example, it will be 0.3 mi E of Bus 34 Interchange to 0.4 mi E of Umber Ave (5 Locations).

	<u>Create</u>	Project File			
Project Number:	NHSN-034-8(159)2R-5	51 ~	File Nø.		
Location	0.3 mi E of Bus 34 Inter	change to 0.4 n	Pin No.	21-51-034-010	
Design Team			Station From		
Bridge Team			Station To		
Import Path C:\V	VORK\51034159_PINKS.acco	db		4	
A			TrafficCount		
В					
BW			VPD_YR		
с					
Z			Received		
E					
M			ToDesign		
Т			ToFinalDesign		
x			NaDasiana		
MW			NoDesigns		
CLEAR			NoPipes		
Road Typical			Designs		
Typical Date					
	TI Cauco	v Can	aal		
	<u>■ Save</u>	× <u>_Cano</u>	<u>cer</u>		

Next, fill out the Design Team. For this example, it will be Holst\Ackerman.

Home Create	External Data Database Tools	Help 🔎 Tell me what you wa	ant to do	
	<u>Create</u>	Project File		
Project Number:	NHSN-034-8(159)2R-5	1 v File No.		
Location	0.3 mi E of Bus 34 Interd	hange to 0.4 n Pin No.	21-51-034-010	
Design Team	Holst\Ackerman 🔍	Station From		
Bridge Team		Station To		
Import Path C:\V	VORK\51034159_PINKS.accdl	0	4	
A		TrafficCount		
В		VPD_YR		
BW				
C Z				
E		Received		
Μ		ToDesign		
т		ToFinalDesign		
x		NoDesigns		
MW CLEAR		-		
		NoPipes		
Road Typical		Designs		
Typical Date				
	<u>Save</u>	× <u>Cancel</u>		

	<u>Create Pro</u>	oject File	
Project Number:	NHSN-034-8(159)2R-51	 File No. 	
ocation	0.3 mi E of Bus 34 Interchan	ge to 0.4 n Pin No.	21-51-034-010
Design Team	Holst\Ackerman	Station From	
Bridge Team	Claman\Diedrich	Station To	
mport Path C:\V	VORK\51034159_PINKS.accdb		9
A 3 3W		TrafficCount VPD_YR	
		Received	
- M		ToDesign	
ŗ _		ToFinalDesign	
K MW		NoDesigns	
CLEAR		NoPipes	
Road Typical Fypical Date		Designs	

Next, add the Bridge Team. For this example, it will be Claman\Diedrich.

Next, fill out the File No. and Station From and Station To.

Note: If the File No. and Station From and Station To are not known at the time of the project creation, leave it blank and fill it in later. Also, creation of the project as a new project is only needed once. It will be accessed from the list button from then on.

Click the save button. The New Project will open at the first record. If the Survey Records (CCRRRPPP_PINKS.sccdb) was imported, it will open at the first record that was imported. For this example, the imported Survey Records (CCRRRPPP_PINKS.sccdb) contained two structures so it will show record 1 of 2 as shown at the bottom left.

Headwater:	
Standard	
Гу Р А	\sim
А	
В	
С	
D	
E	
Record: I ┥ 1	of 2 🕨 🕨 🦗 🔨 No Filt
Form View	

If survey records were not imported, it will show 1 of 1 records. Since the survey records were imported, the Survey Station, the Drainage Area, Terrain Type and Description of the existing structure are shown.

🖬 5· ở· 🔹	Bridges&Struct	ures : Database- W:\Highway\Desig	n\CADD\Access\Bridges &	& Structures Data	Diedrich, Eric		\sim
File Home C	Create Externa	al Data Database Tools	Help 🔎 Tell me	what you want to do			
BRIDGE AND CULV PROJECT NO NHSN-034-8 LOCATION 0.3 mi E of B		PIN NO 21-51-034-010		ckerman	A B BW SEE ROAD	C Z E DESIGN TYPIC	M T X AL NO.
Present Structure	e	/			-	•	
Design No.		Drainage Area 19.15	 acres TerrainTy 	pe: Rolling 🛹	Disposition o	f Present S	tructure:
Survey Station	414+91.90	Description 54"x289'	·				
Remove Apron	~	Remove Headwall To Face Pa	arapet	~			Sort C
PROPOSED STRUC	TURE						Sorre
Station:		Bedding Class:	~		DIKE		
Offset:		Proposed Camber DR102:		Control	DIKE		_
Kind:	~	Design Cover:		Left/Right			
Size:		Pipe Class:	~	Location Statio			
Design No:		Length New Construction:		Top Elevation			- 10
Design Q:		Proposed Apron In:		Туре			- 10
Huadwater:		Proposed Apron Out:		,,			
Standard		Connection Type:	~				
DR	~	Flume Description:					
A		Grade:					
в		Flowline Left:		Apron Guard (DR2	13)		
c		Flowline Right:		Diaphragm (DR501	.)		
D		Flowline Other		Tee Section (DR14	2)		
E		Flowline Other		Reducer			
Record: I 1 of 2	► ► ► ► ► ► No Fi	DR205 Inlet Anron Ton					
Form View	NO FI	Jearch A			==		EK

This is the form that will need to be filled out for each structure in the new drainage design. If the existing structure is being replaced with a new one, fill out the proposed structure information on the record of the existing structure that will be replaced. If the existing structure will be left in place and used as constructed in the new drainage design, leave the proposed structure portion of this record blank. For this example, the existing structure (54" pipe) is being replaced with a new 54" pipe and the Proposed Structure information needs filled out on this record.

The first thing to fill out is the Design number of the existing structure if it is an RCB. This information can be acquired from the as-builts and entered here.

Present Strue	cture				
Design No.		-	Drainage Area	19.15 ~ acres	TerrainTyp
Survey Station		414+91.90	Description	54"x289'	
Remove Apron	Both	\sim	Remove Headw	all To Face Parapet	
PROPOSED ST	RUCTUR	RE			

This example is a pipe, so there is not a design number. Leave it blank.

The next thing to do is decide what will be done with the existing structure. If the structure is a pipe, click on the pulldown on the Remove Apron field. This will provide 3 options, Left, Right and Both. If the pipe is being extended, select the end that is being extended. However, if the pipe is being replaced select Both.

🖬 🔊 e	- - Bridg	jes&Structu	ıres : Datab	ase- W:\H	Highway∖De	sign\CAD	D\Access\B	sric
File Hom	e Create	Externa	al Data	Databa	se Tools	Help	· م	Te
PROJECT NO NH	D CULVERT S SN-034-8(159)2R mi E of Bus 34 Inte	-51	PIN NO	тс	21-51-034-0 D	010	DESIGNE ROAD DRAINAGE TRAFFIC CO	H C
Present Str	ucture							_
Design No.			Drainage	Area	19.3	L5 v acı	res Te	rra
Survey Station	4:	14+91.90	Descript	on	54"x289'			
Remove Apror	1	~	Remove	Headwa	all To Face	Parapet		
PROPOSED S	Left TI _{Right}							
Station:	Both		Bedding	Class:				
Offset:			Proposed	Cambe	r DR102:			
Kind:		\sim	Design Cover:					
Size:		\sim	Pipe Clas	s:				
Design No:			Length N	ew Cons	struction:			
Design Q:			Proposed	Apron	ln:			

If the structure is an RCB, click on the pulldown on the Remove Headwall field. This will provide 3 options, Left, Right and Both. If the RCB is being extended, select the end that is being extended. However, if the RCB is being replaced select Both.

⊟ 5 ° ∂	🔹 🗸 Bridges&Struct	ures : Database- W:\H	- lighway\Des	sign\CADD	Access\Bridg	es & Structures Data
File Home	Create Extern	al Data Databa	se Tools	Help	,∕⊂ Tell	me what you want to do
PROJECT NO NHSN	CULVERT SCHEDU I-034-8(159)2R-51 ii E of Bus 34 Interchange to (PIN NO	21-51-034-0:)	10 D	ESIGNER IN OAD Hols RAINAGE Clar RAFFIC COUNT	st\Ackerman
Present Strue	cture					
Design No.		Drainage Area	19.1	5 – acres	Terrair	nType: Rolling D
Survey Station	414+91.90	Description	54"x289'			
Remove Apron	~	Remove Headwa	III To Face	Parapet		~
PROPOSED ST	RUCTURE				Left Right	
Station:		Bedding Class:			Both	\ I
Offset:		Proposed Camber	r DR102:			Control
Kind:	~	Design Cover:				Left/Right
Size:	~	Pipe Class:				 Location Station
Design No:		Length New Cons	truction:			Top Elevation

For this example, it is a 54-inch pipe and is being replaced with a new structure so select Both.

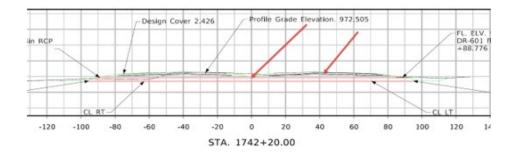
🔒 🔊 è	- - Bridges	&Structu	res : Databa	ase- W:\H	_ −ighway\De	esign\CAD[D\Access	\Bridges & St
File Home	Create	Externa	l Data	Databa	ise Tools	Help	Q	Tell me wh
	CULVERT SC I-034-8(159)2R-51 ni E of Bus 34 Interch		PIN NO	ТС	21-51-034- D	010	ROAD	IER IN CHAR Holst\Ackern E Claman\Diec COUNT
Present Strue	cture							
Design No.			Drainage	Area	19.	15 v acre	es T	errainType:
Survey Station	414	+91.90	Descripti	on	54"x289'			
Remove Apron	Both 🔪	\sim	Remove	Headwa	all To Face	Parapet		
PROPOSED ST	RUCTURE		\searrow					
Station:			Bedding C	Class:				\sim
Offset:			Proposed	Cambe	er DR102:			
Kind:		\sim	Design Co	over:				I
Size:		\sim	Pipe Class	:				\sim
Design No:			Length Ne	ew Cons	struction:			-
Design Q:			Proposed	Apron	ln:			-

Next, fill out the Station of the Proposed Structure. This is the station value that is the intersection point at the centerline of the Proposed Structure and the centerline of the design alignment. For this example, it will be 414+29.00.

Note: When entering this station value, do not place the plus+ just the numeric value and then click in the next field. The database will put in the plus+ as shown below.

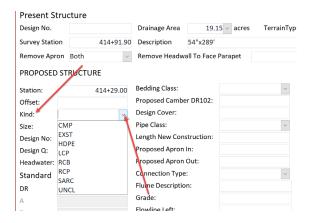
Present Stru	icture			Present Stru	cture			
Design No.		Drainage Area 19.15 v acre	s TerrainType: Rollir	Design No.		Drainage Area 19.1	15 v acres TerrainT	ype: Rol
Survey Station	414+91.90	Description 54"x289'		Survey Station	414+91.90	Description 54"x289'		
Remove Apron	Both	Remove Headwall To Face Parapet	~	Remove Apron	Both ~	Remove Headwall To Face	Parapet	\sim
PROPOSED ST	TRUCTURE			PROPOSED ST	RUCTURE			
		Bedding Class:	~	Station:	414+29.00	Bedding Class:	~	
Station:	41429.00	Proposed Camber DR102:		Offset:		Proposed Camber DR102:		Contr
Offset:			Control	Kind:	~	Design Cover:		Left/F
Kind:	~	Design Cover:	Left/Rig	Size:	~	Pipe Class:	~	Locat
Size:	\sim	Pine Class:	Locatio	Design No:		Length New Construction:		Top E
Design No:		Length New Construction:	Top Ele	Design Q:		Proposed Apron In:		Type
Design Q:		Proposed Apron In:	Туре	Headwater:		Proposed Apron Out:		
Headwater:		Proposed Apron Out:		Standard		Connection Type:	\sim	(
Standard		Connection Type:	~	DR	~	Flume Description:		
DR	~	Flume Description:		A		Grade:		
A		Grade:		в		Flowline Left:		Apron
B		Flowline Left:	Apron G	С		Flowline Right:		Diaph

The next field is Offset field. This is used if the structure is on a divided highway. This will be the distance from the mainline centerline to the Base Line as described in the standards.



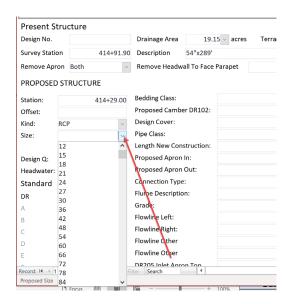
If designing a two-lane highway like in this example, leave this blank.

The next field is the Kind of structure. This refers to what kind of structure is the proposed structure.



For this example, select RCP.

Next, select the size.



For this example, it will be 54"

Present S	uctu	~						
Design No.				Drainage Area	19.1	.5 – acres	TerrainType	e: Rollin
Survey Stati	on	414+91	.90	Description	escription 54"x289'			
Remove Apr	on Bot	h	\sim	Remove Headw	all To Face	Parapet		\sim
PROPOSED	STRUG	CTURE				N		
Station:		414+29.0	00	Bedding Class:		4	~	
Offset:				Proposed Cambe	er DR102:			Control
Kind:	RCP		~	Design Cover:				Left/Rig
Size:		54	~	Pipe Class:			\sim	Locatio
				Length New Con	struction:			Top Ele
Design Q:				Proposed Apron	ln:			Туре
Headwater:				Proposed Apron	Out:			
Standard				Connection Type			\sim	
DR			~	Flume Descriptio	n:			
А				Grade:				
В				Flowline Left:				Apron G
С				Flowline Right:				Diaphra
D				Flowline Other				Tee Sect
E				Flowline Other				Reducer



The Next field is the Design Q. Obtain the value from the ICH program that is used to determine the size of the proposed structure. This comes from the Iowa Runoff Chart.

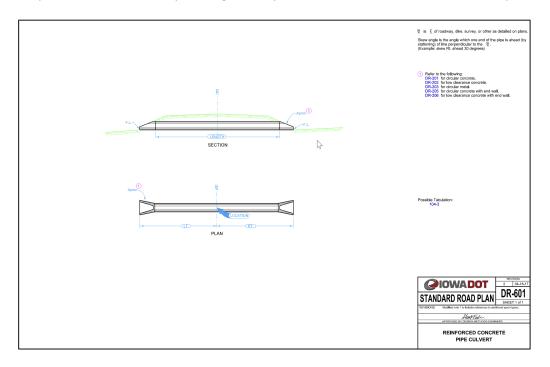
lowa Runoff Chart Drainage Area (Acres, 1 to 1280) 19.15	Com	oute Q's	Prir	nt
Land Use and Slope Select	Chart G	Q (ft^3/s) 70]	
Land Use Mixed Cover		Retum Period (Years)	Frequency Factor (FF)	Q (ft^3/s)
Slope Rolling O.6			0.5	21
		10	0.7	29
C Specify		25	0.8	34
Description		50	1	42
Description		100	1.2	51
LF (0 to 1)				

For this example, it will have a Design Q of 42 because it is designed for the 50-year flood event.

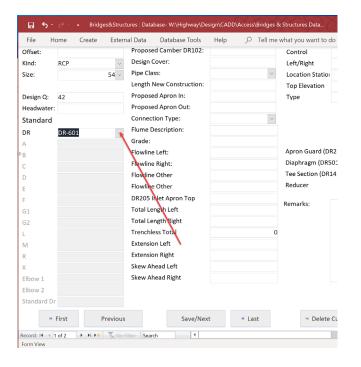
Design No.			Drainage Area	19.15	5 v acres	TerrainType:	Rolling
Survey Statio	n	414+91.90	Description	54"x289'			
Remove Apro	on Both	~	Remove Headw	all To Face P	arapet		\sim
PROPOSED	STRUCTU	JRE					
Station:		414+29.00	Bedding Class:			\sim	
Offset:			Proposed Camb	er DR102:			Control
Kind:	RCP	\sim	Design Cover:			,	Left/Right
Size:		54 ~	Pipe Class:			\sim	Location S
			Length New Con	struction:			Top Elevat
Design Q:	42		Proposed Apron	In:			Гуре
Headwater:			Proposed Apron	Out:			
Standard			Connection Type	e:		\sim	
DR		~	Flume Description	on:			
A			Grade:				
В			Flowline Left:			ŀ	Apron Gua
c			Flowline Right:			(Diaphragm
D			Flowline Other			7	ee Sectio

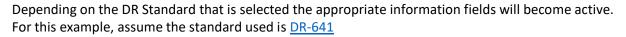
The Next field is the Headwater. This will need to be calculated for the larger structures. However, the example is small enough it is left blank.

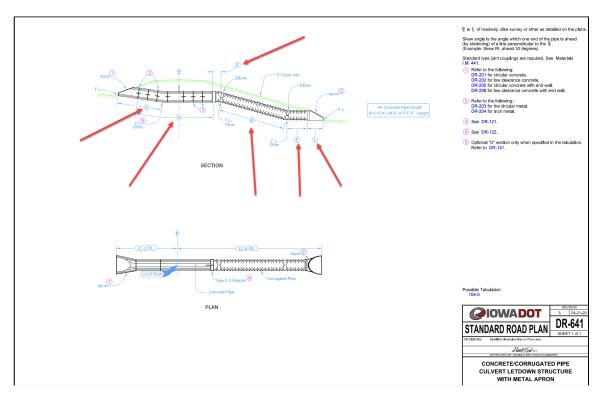
The next field is the design Standard of the proposed structure. Select the correct Standard from the Proposed Structure field by clicking on the pulldown in the DR field. For the example it will be a <u>DR-601</u>.



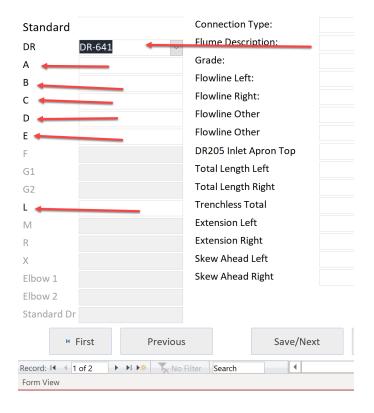
Note: For more information on the Iowa Department of Transportation drainage standards see the web page at this link. <u>https://iowadot.gov/design/stdplne_dr</u>







The information fields A,B,C,D,E and L are now active and the corresponding information will be filled in.



Note: When entering a <u>DR-641</u> use two records in the database. One for the concrete or RCP portion of the structure and one for the CMP or plastic letdown section of the structure. Enter RCP portion on the first record with all special dimensions. Then just the letdown dimensions on the second record. This will allow the structure to be tabulated correctly.

For this design example, use a <u>DR-601</u>.

Next, select the Bedding Class:

survey station	on 414+91.90	Description 54"X289					
Remove Apr	on Both \checkmark	Remove Headwall To Face	Parapet 🗸				
PROPOSED STRUCTURE							
Station:	414+29.00	Bedding Class:		DI			
Offset:		Proposed Camber DR102:	B Control				
Kind:	RCP 🗸	Design Cover:	Left/Right				
Size:	54 ~	Pipe Class:	 Location Station 				
Design No:		Length New Construction:	Top Elevation				
Design Q:	42	Proposed Apron In:	Туре				
Headwater:		Proposed Apron Out:					
Standard		Connection Type:	~				

For pipes it will usually be Class C. However, refer to the <u>DR-101</u> to verify.

Next, enter the Design Cover for the pipe design. This is the distance from the top of the pipe to the shoulder of the roadway. Refer to the <u>DR-102</u> to verify. For this example, it will be 2.42

Present S	tructure						
Design No.			Drainage Area	19.1	5 – acres	TerrainType:	Rolling
Survey Statio	on	414+91.90	Description	54"x289'			
Remove Apr	on Both	\sim	Remove Headw	all To Face	Parapet		\sim
PROPOSED	STRUCTU	JRE					
Station:		414+29.00	Bedding Class:		С	\sim	
Offset:			Proposed Cambe	er DR102:			Control
Kind:	RCP	~	Design Cover:			2.42	Left/Right
Size:		54 ~	Pipe Class:			~	Location Statio
Design No:			Length New Con	struction:			op Elevation
Design Q:	42		Proposed Apron	ln:			Туре
Headwater:			Proposed Apron	Out:			\mathbf{N}
Standard			Connection Type	:		\sim	N
DR	DR-601	\sim	Flume Descriptio	in:			

Next, decide what class of pipe is used for this design. This is determined by the design cover and Bedding Class. Refer to the <u>DR-104</u> to verify. Use 2000 for this example.

tructure		
	Drainage Area 19.	15 v acres TerrainType: Rolling
on 414+91.90	Description 54"x289'	
ron Both 🗸	Remove Headwall To Face	Parapet 🗸
STRUCTURE		
414+29.00	Bedding Class:	C ~
	Proposed Camber DR102:	Control
RCP ~	Design Cover:	2.42 Left/Right
54 ~	Pipe Class:	Location Statio
	Length New Construction:	2000 Top Elevation
42	Proposed Apron In:	3000 4000 Type
	Proposed Apron Out:	4500
	Connection Type:	Unclassified
DR-601 ~	Flume Description:	
	Grade:	
	Flowline Left:	Apron Guard (DR21
	Flowline Right:	Diaphragm (DR501
	Flowline Other	Tee Section (DR142
	on Both STRUCTURE 414+29.00 RCP 54 42	Drainage Area 19. on 414+91.90 Description 54"x289" ron Both Remove Headwall To Face OSTRUCTURE 414+29.00 Bedding Class: 414+29.00 Proposed Camber DR102: RCP Design Cover: Pipe Class: 54 Pipe Class: Length New Construction: 42 Proposed Apron In: Proposed Apron Out: Connection Type: Flume Description: Grade: Flowline Left: Flowline Right: Flowline Right:

Next, enter the Length New Construction value. This is the total length from connection point of inlet apron to connection point of outlet apron. For the example it will be 290'.

The next two fields are Proposed Apron In and Proposed Apron Out. This is used to determine how many aprons will be needed to construct the new pipe. So, for the example place a (1) in each field so that there are two 54" pipe aprons on the 104-3 tab sheet. If the design was to only extend the pipe, place a (1) in the field of the end of the pipe that was being extended, Inlet or outlet.

PROPOSED	STRUCTURE	a			
Station:	414+29.00	Bedding Class:	С	\sim	I
Offset:		Proposed Camber DR102:			Control
Kind:	RCP 🗸	Design Cover:		2.42	Left/Right
Size:	54 ~	Pipe Class:	2000	\sim	Location Statio
Design No:		Length New Construction:		290	Top Elevation
Design Q:	42	Proposed Apron In:		1	Туре
Headwater:		Proposed Apron Out:		1	
Standard		Connection Type:		~	
DR	DR-601 ~	Flume Description:			$\backslash \backslash$
A		Grade:			\setminus
В		Flowline Left:			Apron Guard (DR213
С		Flowline Right:			Diaphragm (DR501)
D		Flowline Other			Tee Section (DR142)
E		Flowline Other			Reducer
F		DR205 Inlet Apron Top			Remarks:
G1		Total Length Left			Remarks.
G2		Total Length Right			

The next field, Connection Type, is for indicating if the design requires a connection type, either a <u>DR-122</u> or <u>DR-141</u>. Select the correct standard and the additional field will appear for the corresponding information for that standard. This will not be used for this design.

The next field is if the design uses a flume. Enter the size and type of flume in this field. This will not be used for this design.

The next field is for the Grade. This is going to be the Profile Grade Elevation that was determined while designing the structure and annotated on the cross section. For this example, it will be 972.50.

Note: The cross section is a great source to use to fill out the following data.

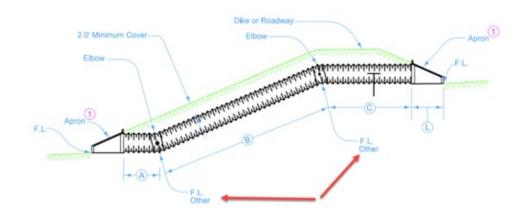
Station:	414+29.00	Bedding Class:	C ~	
Offset:		Proposed Camber DR102:		Control
Kind:	RCP ~	Design Cover:	2.42	Left/Right
Size:	54 ~	Pipe Class:	2000 ~	Location Statio
Design No:		Length New Construction:	290	Top Elevation
Design Q:	42	Proposed Apron In:	1	Туре
Headwater:		Proposed Apron Out:	1	
Standard		Connection Type:	~	
DR	DR-601 ~	Flume Descrip		
A		Grade:	972.50	
В		Flowline Left:		Apron Guard (DR2
С		Flowline Right:		Diaphragm (DR50
D		Flowline Other		Tee Section (DR14
E		Flowline Other		Reducer
F		DR205 Inlet Apron Top		Remarks:
G1		Total Length Left		Remarks:
G2		Total Length Right		
L		Trenchless Total	0	
N 4		Extension Left		

The next 2 fields will be Flowline Left and Flowline Right. This is the elevation of the flowline at the end of the pipe apron.

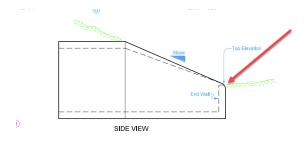
Note: The information was determined during the design process and annotated on the cross section for the next several fields. The cross section is a great source to use to fill out the following data.

Station:	414+29.00	Bedding Class:	C v	
Offset:		Proposed Camber DR102:		Control
Kind:	RCP 🗸	Design Cover:	2.42	Left/Right
Size:	54 ~	Pipe Class:	2000 ~	Location Statio
Design No:		Length New Construction:	290	Top Elevation
Design Q:	42	Proposed Apron In:	1	Туре
Headwater:		Proposed Apron Out:	1	
Standard		Connection Type:	~	
DR	DR-601 🗸	Flume Description:		
A		Grade:	972.50	
В		Flowline Left:	971.69	Apron Guard (DR213
С		Flowline Right:	969.95	Diaphragm (DR501)
D		Flowline Other		Tee Section (DR142)
E		Flowline Other		Reducer
F		DR205 Inlet Apron Top		
G1		Total Length Left		Remarks:

The next fields are used if the standard requires other flowline elevations to be reported, for example a <u>DR-632</u>.



The next field , DR205 Inlet Apron Top, is for the elevation at the top of the end wall of a <u>DR-205</u>. If this apron is used in the design, enter the elevation here.



The next two fields are to report on the Total Length Left and the Total Length Right. This is the distance from center line to end of the apron.

Note: If there is not an offset base line, this will be the offset of the point at the end of the apron.

						,
Size:		$54 ext{ }$	Pipe Class:	2000	\sim	Location Statio
Design No:			Length New Construction:		290	Top Elevation
Design Q:	42		Proposed Apron In:		1	Туре
Headwater:			Proposed Apron Out:		1	
Standard			Connection Type:		\sim	
DR	DR-601	\sim	Flume Description:			
4			Grade:	972.50		
3			Flowline Left:	971.69		Apron Guard (DR2
3			Flowline Right:	969.95		Diaphragm (DR50:
С			Flowline Other			Tee Section (DR14
=			Flowline Other			Reducer
:			DR205 Inlet Apron Top			Demonster
31			Total Length Left	145.00 🔶		Remarks:
3 2			Total Length Right	145.00 🔶	_	
-			Trenchless Total	I	0	
V			Extension Left			
2			Extension Right			
			Cl			

The next field is for reporting the Trenchless Total. This will refer to a pipe that requires to be jacked in place during installation as opposed to being replaced by cut and cover. This field is to enter the total distance of that pipe that is to be jacked.

						,
Size:		54 ~	Pipe Class:	2000	\sim	Location Statio
Design No:			Length New Construction:		290	Top Elevation
Design Q:	42		Proposed Apron In:		1	Туре
Headwater:			Proposed Apron Out:		1	
Standard			Connection Type:		\sim	
D R	DR-601	\sim	Flume Description:			
7			Grade:	972.50		
3			Flowline Left:	971.69		Apron Guard (DR2
3			Flowline Right:	969.95		Diaphragm (DR50:
С			Flowline Other			Tee Section (DR14
Ξ			Flowline Other			Reducer
:			DR205 Inlet Apron Top			Demenden
31			Total Length Left	145.00		Remarks:
3 2			Total Length Right	145.00		
			Trenchless Total	I	0	
VI			Extension Left			
2			Extension Right			
			Cl Al			

The next two fields are for if the design is to extend the existing structure. Enter the total distance in the direction of the extension that is to be constructed.

Design Q.	42		-	i ype
Headwater:		Proposed Apron Out:	1	
Standard		Connection Type:	~	
DR	DR-601 ~	Flume Description:		
А		Grade:	972.50	
В		Flowline Left:	971.69	Apron Guard (DR213)
С		Flowline Right:	969.95	Diaphragm (DR501)
D		Flowline Other		Tee Section (DR142)
E		Flowline Other		Reducer
F		DR205 Inlet Apron Top		Remarks:
G1		Total Length Left	145.00	Remarks:
G2		Total Length Right	145.00	
L		Trenchless Total	(
Μ		Extension Left		
R		Extension Right		
Х		Skew Ahead Left		
Elbow 1		Skew Ahead Right		
Elbow 2				
Standard Dr				

The next two fields are for if the structure is skewed, enter the degree of the angle of the skew in the appropriate field Right or Left.

station:	414+29.00	Bedding Class:	C ~	
Offset:		Proposed Camber DR102:		Contr
(ind:	RCP ~	Design Cover:	2.42	Left/F
iize:	54 ~	Pipe Class:	2000 ~	Locat
Design No:		Length New Construction:	290	Top E
Design Q:	42	Proposed Apron In:	1	Туре
leadwater:		Proposed Apron Out:	1	
Standard		Connection Type:	~	
)R	DR-601 ~	Flume Description:		
7		Grade:	972.50	
3		Flowline Left:	971.69	Apron
2		Flowline Right:	969.95	Diaph
)		Flowline Other		Tee S€
:		Flowline Other		Reduc
:		DR205 Inlet Apron Top		Remar
51		Total Length Left	145.00	Rellial
52		Total Length Right	145.00	
		Trenchless Total	0	
$\sqrt{1}$		Extension Left		
2		Extension Right		
(Skew Ahead Left		
ibow 1		Skew Ahead Right		_
Elbow 2				
itandard Dr				

The next five fields are for when a dike is included in the drainage design.

	C ~		DIKE
2:		Control	
	2.42	Left/Right	
	2000 ~	Location Statio	
h :	290	Top Elevation	
	1	Туре	
	1		
	~		

The next field is for if the design has an <u>DR-213</u>. Enter the number that is needed for that structure.

1	Туре	Nur
~		
972.50		
971.69	Apron Guard (DR213)	
969.95	Diaphragm (DR501)	
	Tee Section (DR142)	
	Reducer	
	Remarks:	
145.00	normarka.	
145.00		

The next field is for when the design has an <u>DR-501</u>. Enter the number that is needed for that structure.

1	Туре	Nur
972.50		
971.69	Apron Guard (DR213)	
969.95	Diaphragm (DR501)	
	Tee Section (DR142)	
	Reducer	
	Remarks:	
145.00		
145.00		

The next field is for when the design has an <u>DR-142</u>. Enter the number that is needed for that structure.

1 1 ~	Туре	ır
972.50		
971.69	Apron Guard (DR213)	
969.95	Diaphragm (DR501)	
	Tee Section (DR142)	
	Reducer	
145.00	Remarks:	
145.00		

The next field is for when the design has a Reducer. Enter the number and size that is needed for that structure.

1	Туре			Nur
~				
972.50				
971.69	Apron Guard (DR	213)		
969.95	Diaphragm (DR50	D1)		
	Tee Section (DR1	42)		
	Reducer			
	Remarks:			
145.00	Nemarks.			
145.00				

The next field is for Remarks. This is intended for the designer to include the design intent and direction on the staging of the replacement for the proposed structure.

Examples of typical remarks:

Plug and abandon exist median drain at Sta 1451+26. Jack 78' of 24" RCP then lay one 6' DR141 Type "D" double bevel section + apron on inlet end at Sta. 1452+25 – 51' Lt

or

Remove 30 ft of existing 36 in RCP. Replace with 42 ft of 36 in RCP with one DR-141 7.5-degree D section beveled end to the RT. Tie new pipe to old pipe with longitude tie bars.

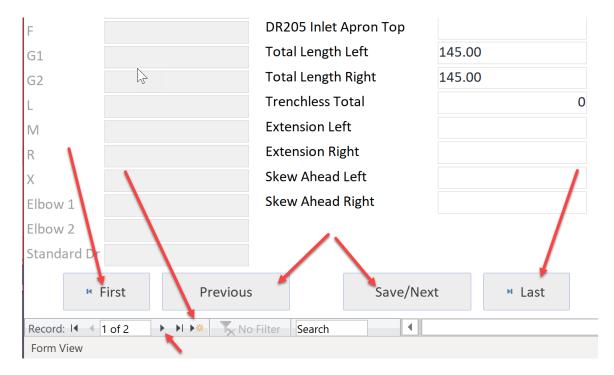
The purpose of the remarks is to eliminate questions during the construction phase of the project.

11101 0022	o officience					
Station:	414+29.00	Bedding Class:	C ~	I	DIKE	
Offset:		Proposed Camber DR102:		Control		
Kind:	RCP ~	Design Cover:	2.42	Left/Right	~	
Size:	54 ~	Pipe Class:	2000 ~	Location Statio		
Design No:		Length New Construction:	290	Top Elevation		Roadwa
Design Q:	42	Proposed Apron In:	1	Туре		Number
Headwater:		Proposed Apron Out:	1			
Standard		Connection Type:	\sim			
DR	DR-601 ~	Flume Description:				
A		Grade:	972.50			
В		Flowline Left:	971.69	Apron Guard (DR213)	
С		Flowline Right:	969.95	Diaphragm (DR501)		
D		Flowline Other		Tee Section (DR142)		
E		Flowline Other		Reducer		
F		DR205 Inlet Apron Top		Remarks: Remo		
G1		Total Length Left	145.00		ove or plug and abandon ex at Sta. 141+91.90 Replace w	
G2		Total Length Right	145.00	RCP a	at Sta. 141+29.00 with inlet	
L		Trenchless Total	0	apro	ns. Cut and cover.	
Μ		Extension Left				
R		Extension Right				
Х		Skew Ahead Left				
Elbow 1		Skew Ahead Right				
Elbow 2						
Standard Dr						

Once all the correct fields that corresponds with that structure standard are entered in the record, move to the next record and repeat the process. If the next structure is to be replacing an existing structure, find the records that were imported from the CCRRRPPP_PINKS.sccdb that corresponds with that structure. If the next structure does not replace an existing structure, make a new record.

PROPOSED STRUCTURE

Click the buttons at the bottom of the record or the arrow buttons in the access database task bar to navigate to the desired record.



Once a record for each structure in the drainage design is finished, create the Schedule Sheet. Click on the Schedule Sheet button at the bottom of the record.

59 95	Apron Guard Diaphragm (E Tee Section (I Reducer	0R501)						
00 00 00	Remarks:	RCP at RCP at	Sta. 141+9	1.90 Repl 9.00 with	on existing 5 ace with 290 inlet and ou	0' 54"		
и Last	≂ Dele	ete Curren	t	Mai	n Menu		Schedule Sheet 🎉	

All the records in the project are compiled onto a Schedule Sheet.

Home	e Cre	ite Ex	ernal Data	Database	Tools	Help	2	Tell m	e what y	you wan	t to do																	
																			Creat	e PDF	_		Data	Entry	Form	M	1ain Menu	
BRIDGE		II VERT S	CHEDULE					DESIGN	ER IN C	HARGE			A		С		М	MW			RE	CEIVED				NO. DE	ESIGNS	
				FILE NO				ROAD		ckerman			B		Z		Т	CLE	AR			ROAD				NO, PI		
PROJECT N	IO NHSN-	34-8(159)2	R-51	PIN NO	21-51-	034-010		DRAINAGE	Claman	\Diedrich			B	w	E		Х				TC	O FINAL	DESIGN			DESIGN	NS	
LOCATION	0.3 mi	of Bus 34 In	terchange to 0.4 r	n	то			TRAFFIC C	TNUC		VPD 1	ſR	SEE	ROAD D	ESIGN TYPI	AL NO.		Date										
DESIGN		PRESENT	STRUCTURE								PR	OPOSED S	TRUCTURE												DIKE			
NUMBER	DRAINAGE AREA	SURVEY STATION	DESCRIPTION	LOCA	OFFSET	DR	SIZE	N	TH DESIGI EW COVEI	R		FLUME	DN GRADE		EVATION HT OTHER	IN AP T	RON ILET ICP LEV LEFT	DIMENS	NCH SS	TENSIONS		REES)	CNTR	LT/RT	LOCATION	TOP	DISPOSITION OF PRESENT	
	19.15-	414+91.90	54"x289'	414+29.00		DR-601	54	RCP 2	90 2.42	1 1			972.50 9	71.69 96	.95		145.00	145.00	2								Poor	Remo at Sta
	Rolling																											at Sta at Sta apror
	11.5-Hily	228+15.65	54"x432'						ĩ)								Fair	

The next step, will be to create a PDF of the Schedule Sheet. Click on the Create PDF button at the top of the Schedule Sheet.

				Bridges8	&Structures	: Datab	ase- W?	\Highway\l	Design\C		ss\Bridge		es Databas	e\Bridges	&Structur		(Access 20	007 - 20	6 file fo		- Acce			Died	rich, Eric 🛞	×9
Home	Cre	ate Ex	ternal Data	Database	Tools	Help	Ç) Tell me	e what y	ou want t	o do															
																	Cre	ate PDF			Data E	intry F	orm		Main Menu	
																	cre	•				y i	onni			
BRIDGE	AND C		CHEDULE	FILE NO				DESIGNE	ER IN CH	HARGE			A	С	M		MW			CEIVED					. DESIGNS	
								ROAD	Holst\Ac				В	Z	Т		CLEAR				DESIGN				. PIPES	
PROJECT NO	D NHSN-	034-8(159):	2R-51	PIN NO	21-51	1-034-010		DRAINAGE	Claman\	Diedrich			BW	E	х				TC	FINAL	DESIGN			DE	SIGNS	
LOCATION	0.3 mi	E of Bus 34 I	nterchange to 0.4 n	n	то			TRAFFIC CO	DUNT		VPD YR		EE ROAD DE	IGN TYPICA	L NO.		Date									
DESIGN		PRESEN	T STRUCTURE								PROPOS	ED STRUCTUR	ε										DIKE			
NUMBER	DRAINAGE AREA	SURVEY STATION	DESCRIPTION	LOC	OFFSET	DR	SIZE	KIND COM		APRON 0		UME RIPTION GRAD	LEFT RIGH		DR-20 INLET APRON TOP THER ELEV	5 TOTAL	TRENCH LESS TOTAL	(E) EXT NSION		REES)	CNTR	LT/RT	LOCATION STATION	TOP TO ELEVATIO EL		
	19.15-	414+91.90	54"x289'	414+29.00		DR-601	54	RCP 25	2.42	1 1		972.5	971.69 969.	5		145.00 145	0 00								Poor	Remove or at Sta, 141
	Rolling																									at Sta. 1414 at Sta. 1414 aprons. Cut
	11.5-Hilly	228+15.65	54"x432'						I								0								Fair	

It will open the dialog box asking to select a directory to save the PDF file. For this example, use the C:\WORK directory that was created to download the CCRRRPPP_PINKS.sccdb to. Once the directory is selected, click the OK button.

Note: The select a directory to save your file		×
← → ~ ↑ 📒 > This PC > Windows (C:) > WORK	✓ Ů	
Organize - New folder		?
> 📙 pw_work	Name	
> 📙 Seed files	No items match your search.	
> 📙 TEMP	No items match your search.	
📜 ТМР		
🔉 📙 ТороDOT		
> 📙 TopoDOTx64		
> 📙 Users		
> 📙 Windows		
> 玄 ediedri (\\ntdfs\HomeFolders\UserE) (P:)		
> 😽 u (∖\dot.int.lan\atscore) (U:)	✓ <	>
Folder name: WORK	1	
	Tools 👻 OK Cancel	

It will create the PDF of the Schedule Sheet in that directory and name the file Project NumberScheduleSheet.PDF. For this example it would be named NHSN-034-8(159)—2R-51ScheduleSheet.pdf. It will display a message to indicate when it is done. Click the OK button to dismiss.

Microsoft Access	×
Ģ	
Your file was saved at C:\WORK\NHSN-034-8(159)2R-51ScheduleSheet.pdf	
ОК	

Next, exit the database. Ciick on the Main Menu button at the top of the Schedule Sheet.

Hom	e Cre	ate Ex	ternal Data	Database	Tools	Help	۶	Tell me what	you want to d	0														
																			-	-				_
															Crea	ate PDF		Data	Entry	Form		Main	Menu	
PRIDCI			CHEDULE					DESIGNER IN	CHARGE		A	С		M	MW		RECEIV	'ED			NC	D. DESIGN	1	_
BRIDGI	ANDC	OLVERTS	CHEDOLE	FILE NO				ROAD Holst	Ackerman		в	Z		т	CLEAR		TO RO	AD DESIGN	4		NC	D. PIPES	I	
PROJECT N	IO NHSN	034-8(159)	R-51	PIN NO	21-51-	034-010		DRAINAGE Clama	n\Diedrich		BW	E		Х			TO FIN	AL DESIGN			DE	SIGNS	I	
LOCATION	0.3 mi	E of Bus 34 In	nterchange to 0.4 r	n	то			TRAFFIC COUNT	VPD) YR	SEE ROAD	DESIGN TYPIC	AL NO.		Date								I .	
DESIGN		PRESEN	T STRUCTURE						P	ROPOSED STRU	CTURE							_		DIKE		<u> </u>		-
	1			LOCA	TION				ADAPTE			ELEVATION		D	MENSIONS	(E)	SKEW AHEA					1		
						1			APRON DR-12				D8-2	205 TOTAL		XTENSIONS	(DEGREES							
						1 1							INL	ET	7 Г									
	DRAINAGE	SURVEY				1 1		LGTH DESI NEW COV		FLUME			APR TO		TRENCH					LOCATION	TOP TO	IP DIS	DSITION OF	
NUMBER	AREA	STATION	DESCRIPTION	STATION	OFFSET	DR	SIZE	KIND CONST (H		0. DESCRIPTION	RADE LEFT	RIGHT OTHER	OTHER ELE		TOTAL I	LEFT RIGHT	LEFT RIG	HT CNTR	LT/RT		ELEVATIO EL		RESENT	
	19.15-	414+91.90	54"x289'	414+29.00		DR-601	54	RCP 290 2.4	2 1 1		72.50 971.69	169.95		145.00 145	00 00								Poor	Ren
	Rolling																							at S at S
																								apri
	11.5-Hilly	228+15.65	54"x432'					Ĩ							0								Fair	

Once in the Main Menu, click on the Exit Database button.

	5.0.	= Bridge	es&Structures : Data	base- W:\Highway\D	esign\CA	DD\Access	\Bridges & Structures Database\Bridges&Structures.accdb (*
File	Home	Create	External Data	Database Tools	Help	Q	Tell me what you want to do
			Main	Menu			
			<u> ■ Proj</u> e	ect List			
			<u>Survey</u>	Records			
			Create Nev	v Project File		1 and 1	
			Export	to 104-3		hg ^a	
			 Export Sch 	edule Sheet			
			💌 Exit D	atabase 🗕 🗕	_		

Place the Project NumberScheduleSheet.pdf file in the Bridge\Design Events\B01\ folder of the project directory in ProjectWise.

ASCII Graphics Import Input File

The format of the ASCII input file is the same format that is utilized by the Iowa Department of Transportation Survey crews. The best way to look at this information is to open the file in Notepad or a similar text editor. The file format is a comma delimited file. This consists of the point number, Y coordinate, X coordinate, Z coordinate, feature and description.

It should look something like this:

I ML pipes from 795 to 1389_8-18-20.txt - Notepad		×
File Edit Format View Help		
190,3452326.737,5254394.771,943.340,LIN7 CL of type M dike at STA 802+80.00 191,3452379.584,5254394.771,943.340,LIN7 CL of type M dike at STA 802+80.00	Point Number	* E
192,3452346,145,5234114,302,940,384,PRO SIA 803+00.00 DR-201 Inlet end of apron 24in RCP Median Drain 193,3452340,202,524414,822,939,458,PIP22 STA 803+00.00 DR-601 Inlet 24in RCP Median Drain 194,3452248.291,5254415,294,934,932,1772 CTA 803+00.00 DR-601 Outlet 24in RCP Median Drain 195,3452242.166,5254415.325,944,330,PRO STA 803+00.00 DR-201 Sutlat end of apron 24in RCP Median Drain		
196,3452179.936,5255740.655,930.942,PRO STA 816-25_00 DR-201 outlet end of apron 36in RCP PHASE 1 197,3452187.936,5255740.615,930.988,PTP2* STA 816+25.00 DR-601 Outlet of 36in RCP PHASE 1 198,3452395.934,5255739.568,932.180,PTP23 STA 816+25.00 DR-601 Outlet of 36in RCP PHASE 1 199,3452395.934,5255739.568,932.180,PTP24 STA 816+25.00 DR-601 Outlet of 30in RCP PHASE 2 200,345231.932,555738.953,932.902,PTP24 STA 816+25.00 PR-601 Outlet of 30in RCP PHASE 2 201,3452521.932,5255738.933,932.902,PTP24 STA 816+25.00 PR-601 Outlet of 30in RCP PHASE 2 201,3452521.932,5255738.933,932.948,PRO STA 816+25.00 DR-201 tolet end of apron 36in RCP PHASE 2	Y = coordinate	
202,3452362.023,5256714.769,946.846,PRO STA 826+00.00 DR-203. Inlet end of apron 24in RCP Median Drain 203,3452355.879,5256714.829,945.739,PIP25 STA 826+00.00 DR-601 24in RCP Median Drain 204,3452566.133,5256715.738,941.293,PIP25 STA 826+00.00 DR-601 24in RCP Median Drain 205,3452260.008,5256715.768,940.990,PRO STA 826+00.00 DR-201 outlet end of apron 24in RCP Median Drain	- x = coordinate	
206,3452393.506,5256734.709,949.610,LIN8 CL of type M dike at STA 826+20.00 207,3452342.891,5256734.709,949.610,LIN8 CL of type M dike at STA 826+20.00	Z= coordinate	
208,3452371.800,5257714.721,941.846,PRO STA 836+00.00 DR-201 Inlet end of apron 24in RCP Median Drain 209,3452365.676,5257714.781,940.702,PIP26 STA 836+00.00 DR-601 24in RCP Median Drain 210,3452271.980,5257715.699,935.348,PIP26 STA 836+00.00 DR-601 24in RCP Median Drain 211,3452265.856,5257715.759,935.000,PRO STA 836+00.00 DR-201 Outlet end of apron 24in RCP Median Drain		
212,3452403.303,5257734.661,944.610,LIN9 CL of type M dike at STA 836+20.00 213,3452352.689,5257734.661,944.610,LIN9 CL of type M dike at STA 836+20.00	Feature	
214,3452383.679,5258314.634,939.565,PRO STA 842+00.00 DR-201 Inlet end of apron 24in RCP Median Drain 215,3452377.554,5258314.694,938.314,PIP27 STA 842+00.00 DR-601 24in RCP Median Drain 216,3452369.854,5258314.769,936.671,PIP27 STA 842+00.00 DR-141 1-7.5 degree 'D' Section of 24in RCP Median D 217,3452273.875,5258315.709,928.897,PIP27 STA 842+00.00 DR-601 Outlet of 24in RCP Median Drain 218,3452260.074,5258315.845,928.439,PRO STA 842+00.00 DR-201 Outlet end of apron 24in RCP Median Drain	orain +13.825 RT	
219,3452238.993,5258576.064,919.750,PRO STA 844+50.00 DR-201 outlet end of apron 42in RCP PHASE 1 220,3452246,992,5258575.985,919.968,PIP28 STA 844+50.00 DR-601 42in RCP PHASE 1 221,3452410.917,5258574.379,924.436,PIP28 STA 844+50.00 DR-601 42in RCP PHASE 1 222,3452410.917,5258574.379,924.436,PIP29 STA 844+50.00 DR-601 42in RCP PHASE 2 223,3452500.912,5258573.497,926.888,PIP29 STA 844+50.00 DR-601 42in RCP PHASE 2	Discription	Ŧ
< III		► at

The first number is the point number. This number can start as any number but cannot be repeated in the ASCII file. It is a good idea not to repeat it per project either. This number needs to increase as the file grows.

The Second number is the Y coordinate of the invert.

The third number is the X coordinate of the invert.

The fourth number is the Z coordinate of the invert.

The fifth value is the feature. The feature can map or draw many different lines and/or cells. For this process, the two features to use are PIP and PRO. The first is a linear feature that will make a line between points. This feature is the PIP feature which is the survey feature for pipes. To make each linear feature unique, add a number to the feature so that the application knows what feature points should be connected.

The first feature will be PIP1, the next one will be PIP2 and so on.

The second feature is a point feature that will place a cell. The PRO feature which is the survey feature for profile shot will place a red circle with the center of it being the origin. There needs to be one for each end of the pipe apron flow line.

The sixth value is the point description of each point. This value is a little different than the previous values because it is not separated from the other values by a comma. A space between it and the feature is used instead. Also, up to 256 characters can be used to describe the point that will be mapped. For this process describe the point by design station, design standard, indicate inlet or outlet, include size and last the type of structure. It is suggested to include the comment that will become the notes on the schedule sheet. This will make it easier to input the information into the data base by copying and pasting it into the database and not retyping it.

This is an example for a 24 inch RCP median drain at station 803+00.00

193,3452340.020,5254414.832,939.458,PIP22 STA 803+00.00 DR-601 Inlet 24in RCP Median Drain

Once all the invert coordinates are recorded in the ASCII graphics import input file, it should look something like this:

190.3452326.737.5254394.771.943.	340,LIN7 CL of type M dike at STA 802+80.00	
	340,LIN7 CL of type M dike at STA 802+80.00	
	584, PRO STA 803+00.00 DR-201 Inlet end of apron 24in RCP Median Drain	
	458,PIP22 STA 803+00.00 DR-601 Inlet 24in RCP Median Drain	
	F_{22} , F_{22} STA 803+00.00 DR-601 outlet 2411 RCP Median Drain	
	300,PRO STA 803+00.00 DR-201 Outlet end of apron 24in RCP Median Drain	
	942,PRO_STA 816+25.00 DR-201 Outlet end of apron 36in RCP PHASE 1	
	988,PIP23 STA 816+25.00 DR-601 Outlet of 36in RCP PHASE 1	
	180,PIP23 STA 816+25.00 DR-601 Inlet of 36in RCP PHASE 1	
199,3452395.934,5255739.568,932.	180,PIP24 STA 816+25.00 DR-601 Outlet of 36in RCP PHASE 2	
200,3452521.932,5255738.933,932.	902,PIP24 STA 816+25.00 DR-601 Inlet of 36in RCP PHASE 2	
201.3452521.932.5255738.933.932.	948, PRO STA 816+25.00 DR-201 Inlet end of apron 36in RCP PHASE 2	
	846,PRO STA 826+00.00 DR-201 Inlet end of apron 24in RCP Median Drain	
	739.PIP25 STA 826+00.00 DR-601 24in RCP Median Drain	
	293,PIP25 STA 826+00.00 DR-601 24in RCP Median Drain	
	990, PRO STA 826+00.00 DR-201 Outlet end of apron 24in RCP Median Drain	
	610,LINS CL OF TYPE M dike at STA 826420.00	
	GIO,LINS CL OF TYPE M dike at STA 826+20.00	
	846,PRO STA 836+00.00 DR-201 Inlet end of apron 24in RCP Median Drain	
	702,PIP26 STA 836-00.00 DR-601 24in RCP Median Drain	
210,3452271.980,5257715.699,935.	348,PIP26 STA 836+00.00 DR-601 24in RCP Median Drain	
	000,PRO STA 836+00.00 DR-201 Outlet end of apron 24in RCP Median Drain	
	610,LIN9 CL of type M dike at STA 836+20.00	
	610,LIN9 CL of type M dike at STA 836+20.00	
214,3452383.679,5258314.634,939.	565,PRO STA 842+00.00 DR-201 Inlet end of apron 24in RCP Median Drain	
	314,PIP27 STA 842+00.00 DR-601 24in RCP Median Drain	
216,3452369.854,5258314.769,936.	671,PIP27 STA 842+00.00 DR-141 1-7.5 degree 'D' Section of 24in RCP Median Drain +13.83	25
217,3452273.875,5258315.709,928.	897,PIP27 STA 842+00.00 DR-601 Outlet of 24in RCP Median Drain	
218,3452260.074,5258315.845,928.	439,PRO STA 842+00.00 DR-201 Outlet end of apron 24in RCP Median Drain	
	750, PRO STA 844+50.00 DR-201 Outlet end of apron 42in RCP PHASE 1	
	968,PIP28 STA 844+50.00 DR-601 42in RCP PHASE 1	
	436,PIP28 STA 844+50.00 DR-601 42in RCP PHASE 1	
	436,PIP29 STA 844+50.00 DR-601 42in RCP PHASE 2	
	888,PTP29 STA 844+50.00 DR-601 42in RCP PHASE 2	
	106, PRO STA 844+50.00 DR-201 Inlet end of apron 42in RCP PHASE 2	
	846.PRO STA 86401.00 DR-201 Inlet end of apron 241n RCP Median Drain	
	924,PPP30 STA 856+00.00 DR-601 Inlet of 24in RCP Median Drain	
	465,PIP30 STA 856+00.00 DR-601 outlet of 24in RCP Median Drain	
	350,PRO_STA 856+00.00 DR-201 Outlet_end_of_apron 24in RCP Median Drain	
	610,LIN10 CL of type M dike at STA 856+20.00	
	610,LIN10 CL of type M dike at STA 856+20.00	
1000,3452403.131,5261014.573,906	.596,PRO STA 869+00.00 DR-201 Inlet of DR-641 end of apron 24in RCP	
•	III	

Once the input file is complete then it can be loaded in the application file. PW08 Loading the ASCII graphics input file

Loading the ASCII Graphics Input File

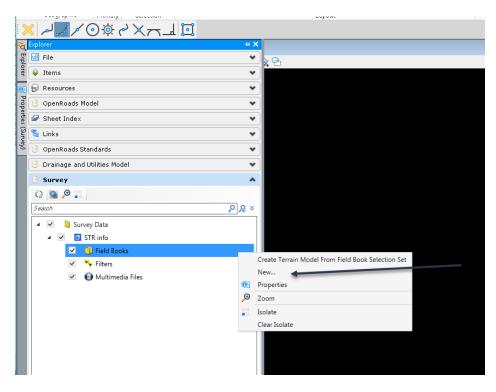
These instructions were created on 3/23/2021. These instructions were created with:

OpenRoads Designer CONNECT Edition - 2020 Release 3 Update 9 - Version 10.09.00.91

Once the ASCII graphics input file is done then the file is ready to load in the OpenRoads Deisgner file. With the file open, go to the Models dialog box and select the STR info to make it the active model.

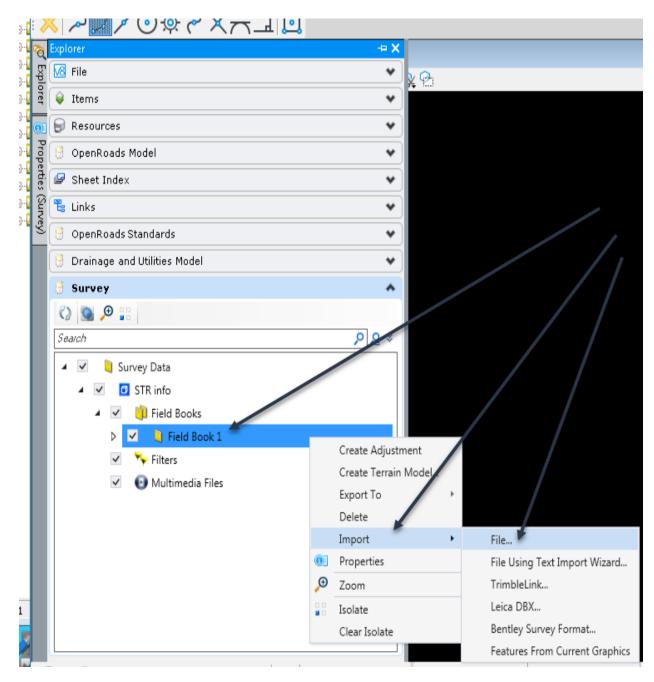
🗇 Mode	els				-	×
Туре	2D/3D	Name	Description	لل	Cell Type	Design File
Q		PIPES	Road Pipes	\checkmark	Graphic	\OR
	Ĩ	STR info	Pipe and Culvert info 3D	\checkmark	Parametric	\OR
		PIPES-3D		\checkmark	Graphic	\OR
<						>

In Project Explorer under the Survey tab select Field Books under STR info, then right click and select New. The name of the Field Book is automatic using a sequential number starting with 1. This will make a new field book that will be used to load the ASCII graphics input file that contains the invert coordinates.



Solution OpenRoads Designer C

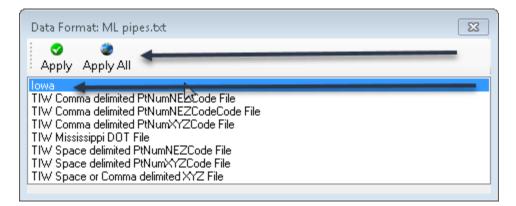
Next select the new field book, then right click and select import. Select the ASCII graphics input file that was created.



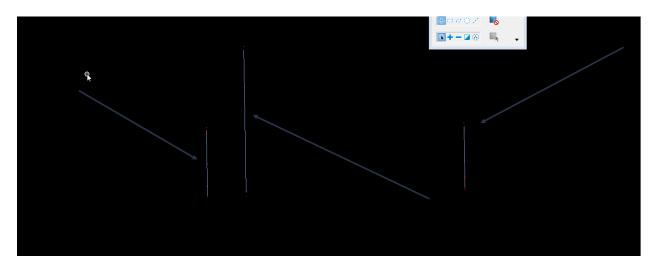
Select file		×
Select		
Documents		
Folder 💕 Bridge	- 🔶 🔰 📰	
M 🔍		-
Name	*	*
🥒 🚣 bridge iso		
/ dsnOpenRo		
ML pipes.txt		
New File sw	.obax 206_0118_DOT_SPN fixed.dgn	
	206_0110_001_01N NACCARGIN	-
<		•
Application:	All Applications	•
Selected Documents	Add Remove	
Name		Fo
< III		4
	ОК	Cancel

Then browse to where the Survey input file that contains the invert coordinates is stored. Click OK.

It will prompt for the data format. Select the Iowa format and then click Apply All.



This will map all the points and lines in the survey input file.



Once the points and lines from the ASCII graphics input file are loaded and the correct location is verified, then start creating the structures.