Setting up the OpenRoads Designer File for Drainage Design.

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



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



The Copy Seed utility will open.

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Next, name the file. For culverts, the naming convention for this file is ORD_CCRRRPPP_DOT_STR_CIP_SPN.

where

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

For this example, the file will be ORD_86063060_ DOT_STR_CIP_Z05.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.

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

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Then select the correct coordinate projection for this file. For this example, select Z05 for IaRCS Zone 05.



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

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This creates the correct dgn file in the project directory.

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A message saying New document created successfully displays.

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

Once the file is created, select the file and right click to rename and add the Description. For this file it will be CIP RCB model.

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Next, make a copy of the file just created and rename it to make it the precast file.

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

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

With the file open, rename the Default model to CIP RCB for the ORD_CCRRRPPP_DOT_STR_CIP_SPN file and rename the Default model to PC RCB for the ORD_CCRRRPPP_DOT_STR_PC_SPN file.

For more information on the model naming refer to <u>https://iowadot.gov/bridge/tools/CONNECT%20Models.pdf</u>

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Next, set the file up to use the muti-model workflow. Use the existing ground TRN file to create the 3D managed model. Reference in the existing ground TRN file to the now renamed CIP RCB 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.

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_86063061Z05.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, set up multi-model view to be able to use the muti-model workflow.

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 CIP RCB-3D model in the View Setup section of the View Attributes tool.

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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.



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 just created and check it into ProjectWise.

Open the precast file ORD_CCRRRPPP_DOT_STR_PC_SPN and repeat the same steps to this file.

Once the precast model file is set up, copy the ORD_CCRRRPPP_DOT_STR_CIP_SPN file and the ORD_CCRRRPPP_DOT_STR_PC_SPN file to the (Paren)_Work Description folder then rename the files for the designs that are needed.

Files should be like this:

SHT_CCRRRPPP_DS#_001425_CIP_SPN.dgn with a description = Twin 10x10 RCB Culvert Design #

SHT_CCRRRPPP_DS#_001425_PC_SPN.dgn with a description = Twin 10x10 RCB Culvert Design #

Keep in mind, if the precast is an option; then two SHT files are needed for each location, one for CIP and one for precast. Each location will have a design number along with a FHWA number or Asset ID number. 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.

For this example, there are two locations that will need to have new designs created for new RCB culverts:

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Next, open each of the SHT files. Then, detach the TRN file reference.

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Then attach the correct model file from under the bridge folder using live Nesting Depth of 2. Do this for each sheet file.

For the CIP sheets, attach ORD_CCRRRPPP_DOT_STR_CIP_Z01.dgn For the precast sheets, attach ORD_CCRRRPPP_DOT_STR_PC_Z01.dgn Save settings and exit the file.

In the Bridge folder and open the ORD_CCRRRPPP_DOT_STR_CIP_Z01.dgn. Attach the survey file that contains the existing 3D culvert and surrounding topo features that will be 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 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 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 contents should look something like this:

Next, click Save Settings.



The last step to setting up the CADD files for culvert design is to make sure the CIP RCB-3D and the PC RCB-3D models are 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.

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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_STR_CIP_Z01.dgn and the ORD_CCRRRPPP_DOT_STR_PC_Z01.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 culvert inverts from the project information.

CW02 Laying out Culverts in Connect

Laying out Culverts and Drainage Design 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:

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

Two methods can be used to analyze the corridor to design the new structures. If designing a structure that is perpendicular to the alignment, use the first method of Cutting a Dynamic Section.

First Method

Cutting a Dynamic Section - The tool needed to do this is in the OpenRoads Modeling workflow on the Corridors tab in the Review group or on the Drainage Utilities workflow on the Utilities View tab in the Drawing Views group. Keep in mind that these tools work well if the structure is placed 90 degrees from the alignment. If the desired design is not, then use the second method.

When using this tool, the recommendation is to turn the corridor reference display off in the 2D model View 1. This was done previously when setting up the CADD file. The reason for this, is this tool will ask to select a corridor or alignment. With the corridor turned off, selection of the alignment is easier. To do this, make sure the View 1 is set to be the active view and open the Reference dialog box and turn off the corridor.

Next, open a view to display the section in. For this example, use View 7.

In the OpenRoads Modeling workflow; on the Corridors tab in the Review group, select the Dynamic Sections tools.



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Then select the Open Cross Section View tool.

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It prompts to locate the alignment.

Data point on the alignment in the 2D view. In this example View 1.





Then select the Offset Left. This will determine how far left the section will cover.

Then select the Offset Right. This will determine how far right the section will cover.



Then select the Station.

Note: This does not need to be perfect when selecting it here, it can be adjusted later to a specific station.



Select the Interval.

Note: Recommend an interval of 0.5 = 6" for culvert design.





Select the View. Data point in View 7 and the section will appear.

Adjust the Station with the pull down at the top of view window.





Then type the Station value needed and hit enter.

Or use the arrow buttons on each side of the Station value field to change the station at the Interval that was selected when the section was created. The value $0.5 = 6^{"}$ was used so it will advance or move back every 6" by clicking on the buttons.



Now that there is a section cut in the area for placing the new structure, place the headwall cell that corresponds with the structure design.

To do this, make the View 1 = 2D model active and use the place cell tool.



Select the correct cell library

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Click on the dots next to the Active Cell field.

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This will open the following dialog box. Then click on the File menu.



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Once the correct cell library is attached, select the correct cell that corresponds with the structure that is being designed.

For this example, use the single 8' x 5' 15-degree CIP RCB. The cell needed is 0805B1P

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B	0805C1P	8x5 30 SINGLE PARALLEL	Graphic		
B	0805C2F	8x5 30 TWIN FLARED	Graphic		
B	0805D1F	8x5 45 SINGLE FLARED	Graphic		
8	0805D1P	8x5 45 SINGLE PARALLEL	Graphic		
8	0805D2F	8x5 45 TWIN FLARED	Graphic		
B	0806A1F	8x6 0 SINGLE FLARED	Graphic		
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Then place this cell in the 2D View 1 next to the location of the structure being designed.



Copy the profile part of the headwall into the cross-section model in View 7.

To do this, make the View 1 active by clicking on top of the view.



Then select the drop element tool.



Select complex.

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Then click on the cell, which allows selection of just the profile part of the headwall cell.

Then use the element selection tool and select the profile part of the headwall cell that was just placed.



Press the Ctrl + C key on the keyboard to do a copy. Then make the View 7 active by clicking on top of the view. In View 7, right click and hold for a second to access the right click menu.

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Select Paste from Clipboard. The profile part of the headwall cell should appear on the end of the cursor in that view. Datapoint to place the cell.



This was done to provide a copy of the profile part of the headwall cell in the Cross Section Dynamic view window that will be used to determine the invert locations of the structure. These are intended to be used as temporary graphics and will remain in this view no matter what section is cut until deleted. Once done using them it is good practice to delete them.

Next, select the profile part of the headwall cell that was just placed in the Dynamic Cross Section view with the element selection tool. Use the Mirror tool, set it to Vertical direction and toggle on Make Copy to make the cell for the other side of the structure. This is used to determine the invert locations at the other end of the structure.

r Attach Tools + 65 + 56	lement Of Cools +	Place Place Arc SmartLine Line Tools * N * A *	Move Copy Rotate	Modify Break Trim	Measure Measure Angle
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		View Properties 🔻 🖊 🔺 E 157+65.00	▼ ▶ ▶		
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		330-1 930-1	₹, ¹ 6; ¹ ∞, ¹ 6; ¹ 6; ¹ 6; ¹ 6;	1 0 0 0 0 0 0 0 0 0 0	10' 60' 60' 10' 10' 930

These graphics can be moved and placed anywhere they are needed to design the new structure.



If designing a structure that is not perpendicular to the alignment, use the second method of Designing in the Profile Window.

Second Method

Designing in the Profile Window - To start, place a line where the structure should be placed.



Then, cut a section on that line where it intersects the alignment. This will give us a station value for the new structure.

For this example, it will be STA 1766+36.14



Next, place a geometry base line on the line placed as the structure alignment, the red line in the image above. Change the workflow to OpenRoads Modeling workflow. On the Geometry tab select the Line tools in the Horizontal group.

OpenRoads Mode	eling 🔸		<	📌 🔒 🧧 📄 🔻 pw:\\ntPv	/Int1.dot.int.lan:PWMain\Documents	s\Projects\7703504015\Bridge\OR[
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Coordinate Svstem		Attach Tools *	₹ ₹	Element Selection - ·	↓Z Import/Export ▼ Civil T	55
🗯 Geographic	1	Primary	Primary	Selection	General Tools	
	/					V. 2 DIDEC 2D

Select the Line Between Points tool.



Then set the Feature to Geom_Baseline



Name the feature as the station location of the proposed structure in the Feature Name field.

Primary -Primary Selection General loois 可 View 2, PIPES Li. \times Parameters ^ Distance 21.484 N90°00'00.0"E Line Direction ^ Feature Feature Definition Geom_Baseli Enter Start Name STA 1766+36.14 Point Line Level: brgPreStructureNew

For this example, it will be STA 1766+36.14.

Select a start point by snapping on the end of the line placed as the structure alignment, the red line in the image above.



Then enter the end point.

It should look something like this:



Next with the element selection tool, select the geometry just created.



Open a window to view the profile in. The recommendation is to use View 8 for the profile window and View 7 for the cross section window.

Note: Do not try to use the same window for both.

For this example, use View 8. Once the view is open, return to View 1 that has the geometry just created already selected. Hover over it to open the heads-up tools.

Select the Open Profile Model tool.



It will prompt to Select or Open View. Data point in the open profile window View 8.



It should look something like this:



Explorer Attach Tools 🗳 🔛 📻 View Attributes - View 8 Stanc ^{Prir} View Number: 8 - 🔁 🛋 hic -14 Presentation 🛬 - 上 🕀 🗩 Display Style: (Wireframe Display) ~ ... So 🔒 ACS Triad 🔆 Fast Cells Background 📄 Fill Boundary Display Grid Camera 🚝 Level Overrides View 8, Pro Clip Back Line Styles **▼** -(Clip Front Line Weights <u>i</u> 💑 Clip Volume Markers 975-974-973-972-971-969-968-968-966-966-966-966-Patterns Constructions 🥖 Default Lighting 0 Tags Δ Dimensions Text + Text Nodes ----] Data Fields Displayset Transparency Height Field Global Brightness: > () or long of the state of the sta 🛃 View Setup ^ Saved Views: Selec... ... Models: Profile ~ analytic Symbology \sim Civil ^ Exaggeration 10 ~ 10 20 50 1 2 3 4 5 6 7 8 🕁 🖌 X 26.938 → 🔽 Multi-Model Viev 100

Next, set the exaggeration to 1 in the View Attributes dialog box.

It is recommended to have the fill and line weights turned off.

F View Attrik	outes - View 8	-	<
View Number:	8 - 🔁 🛋		
闵 Presenta	tion		^
Display Style:	(Wireframe	Display) ~	
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Backgroun	d	📄 Fill	
Boundary I	Display	Grid	
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Clip Back		Line Styles	
Clip Front		Line Weights	
Clip Volum	ie	Markers	-
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Models:	Profile 🗸		
🐚 Analytic S	Symbology		~
Civil			^
Exaggeration			
1 ~		-	

Next, create a 3D cut along this geometry.

Vie	ew 8, Profile - STA 1766+36.14			X
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To do this, select the Create 3D Cut tool.



Use the Corners method. Data point to accept the method.



It will prompt to locate the start point. Make sure the start is all the way to one side or the other. It is recommended to start at the top right and end at the lower left.



View 8, Profile - STA 1766	5+36.14						
$\boxed{} \cdot \cdot $							
1250- 1200-	Γ						
1150- 1100- 1050-							
1000- 950- 900-		-					
850- 800-							
750- 700- 650-	L	¥					
600- 550-		Locate End Point Line: STA 1766+36.14					
9 40 54 54 7 40 1 40 54 50 54 50 54 50 54 54 54 54 54 54 54 54		Feature: Alignment\Geom_Baseline No Active Profile	N ST CO				

After the data point, it will start drawing a box in the view that the 3D cut is in.

Data point the end point to complete the 3D cut.

It should look something like this:

View 8, Profile - STA 1766+36.14	
1020- 1019-	
100- 1005- 1000-	
985- 990- 988-	
980- 975-	
865- 860-	
955- 990- 645-	
	2 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6

Now that there is a 3D cut created in the area for placing a structure, one more thing needs added to the view to do the design. Place the headwall cell into the profile model in View 8.

To do this, follow the same steps used in the first method to get the headwall cell into the Dynamic Cross Section view. Move headwall cells to correct design standards locations.

Next, measure the distance and adjust this line between the headwall cells to make it be an even 1' interval.

Once the structure design is as desired, then record the invert elevations and offsets of each key point.

If using the ASCII graphics input file method demonstrated in these instructions, that is the location to record that information. For more information about the ASCII graphics input file, please refer to <u>CW03_ASCII Graphics Import Input File</u> chapter.
To record the invert elevations and offsets of each key point, make sure the AccuDraw is toggled on.

Note: AccuDraw toggle is located in the Primary group on the More tool pulldown.



Then snap to each key point. The AccuDraw coordinate readout box will display each point coordinates. The X = offset and the Y = elevation.



III *Untitled - Notepad	– – ×
File Edit Format View Help	
100,0000000.000,00000000.000,967.228,PRO STA 1742+27.76 DR-201 Flowline e	nd of apron -95.606 LT
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	- 4005 - 4003 - 4003 - 4004 - 4005 - 4005 - 4005 - 4005 - 4005 - 4005
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🕞 🕶 🔂 Multi-Model Views 🔹 🔁 1 2 3 4 5 6 7 8 💥 🗸 🗴 -95.606	Y 967.228
	□ brgPreStructureNew 万

Record each of these values for each point in the ASCII graphics input file.

Next, repeat this for each key point that is needed to model the culvert.



Once all the values are recorded, calculate the X and Y coordinates. Use Civil AccuDraw or standard AccuDraw.

Note: When using Civil AccuDraw make sure standard AccuDraw is turned off before toggling on Civil AccuDraw. MicroStation does not perform well with both toggled on at the same time.

The standard AccuDraw method will be covered in another chapter.

Locate the correct station for the structure along the alignment. For this example, it will be 1742+27.76. Once this location is known, select the smart line tool and snap to that point or station along the alignment to start the line.



With the line started, type R Q on the keyboard to rotate quick the AccuDraw compass. Then with a Nearest snap, snap to the alignment.



This will rotate the AccuDraw compass so that it is set to the alignment's axis. Pull the line in the direction needed to calculate the coordinate and type in the distance of the offset of that point.

For this example, it will be -95.606. Pull the line to the left of the alignment and type in 95.606.

Note: Negative numbered offsets are to the left and positive numbered offsets are to the right.



Then data point to accept it. This way, a perfect 90-degree line from the CL is drawn that is the correct distance for the offset. Then snap to the end of this line.



AccuDraw will display the X and Y Coordinates of that point.

Then place these coordinates in the ASCII graphics input file. Repeat this process for each input point.

ASCII Graphics Import Input File

Once the invert coordinates of the culverts to be modeled are determined, there are two options to place it. 1st is with Civil AccuDraw; 2nd is with the ASCII graphics.

The format of the ASCII graphics input file will be covered first. In a Notepad file, make a comma delimited format file. This consists of the point number, Y coordinate, X coordinate, Z coordinate, feature and description.

It should look something like this:

] ML pipes from 795 to 1389_8-18-20.txt - Notepad	_ 0 🔀
ile Edit Format View Help 90,3452326.737,5254394.771,943.340,LIN7 CL of type M dike at STA 802+80.00 91,3452379.584,5254394.771,943.340,LIN7 CL of type M dike at STA 802+80.00	Point Number
92,3152346.145,3234414.801,940.384,PRO STA 803+00.00 DR-201 Inlet end of apron 24in RCP Median Drain 93,3452340.020,5 54414,832,939.458,PTP22 STA 803+00.00 DR-601 Inlet 24in RCP Median Drain 94,3452248.291,5254415.294,934,022,prinz3 STA 803+00.00 DR-601 Outlet 24in RCP Median Drain 95,3452242.166,5254415.325,624.300,PRO STA 803+00.00 DR-201 Outlet 24in RCP Median Drain	
96,3452179.936,5255740.655,930.942,980 STA 816,25 00 DR-201 outlet end of apron 36in RCP PHASE 1 97,3452187.936,5255740.615,930.988,PTP23 STA 816425.00 DR-601 outlet of 36in RCP PHASE 1 98,3452395.934,5255739.568,932.180,PTP23 STA 816425.00 DR-601 Inits of 36in RCP PHASE 1 99,3452395.934,5255739.568,932.180,PTP24 STA 816425.00 DR-601 outlet of 36in RCP PHASE 2 00,3452521.932,5255738.933,932.902,PTP24 STA 816425.00 DR-601 Inits of 36in RCP PHASE 2 01,3452521.932,5255738.933,932.902,PTP24 STA 816425.00 DR-601 Inits of 36in RCP PHASE 2	Y = coordinate
02,3452362.023,5256714.769,946.846,PRO STA 826+00.00 DR-201 Inlet end of apron 24in RCP Median Drain 03,3452355.879,5256714.829,945.739,PIP25 STA 826+00.00 DR-601 94in RCP Median Drain 04,3452266.133,5256715.788,941.293,PIP25 STA 826+00.00 DR-601 24in RCP Median Drain 05,3452260.008,5256715.768,940.990,PRO STA 826+00.00 DR-201 outlet end of apron 24in RC- Median Drain	- x = coordinate
06,3452393.506,5256734.709,949.610,LIN8 CL of type M dike at STA 826+20.00 07,3452342.891,5256734.709,949.610,LIN8 CL of type M dike at STA 826+20.00 08,3452371.800,5257714.721,941.846,PRO STA 836+00.00 DR-201 Inlet end of apron 24in RCP Mediam Drain 09,3452365.676,527714.781.940.702,PIP26 STA 836+00.00 DR-601 24in RCP Mediam Drain	Z= coordinate
10,3452271.980,5257715.699,935.348,PIP26 STA 836+00.00 DR-601 24in RCP Median Drain	Feature
14,3452383.679,5258314.634,939.565,PRO STA 842+00.00 DR-201 Inlet end of apron 24in RCP Median Drain 15,3452377.554,5258314.694,938.314,PTP27 STA 842+00.00 DR-601 24in RCP Median Drain 16,3452369.854,5258314.769,936.671,PTP27 STA 842+00.00 DR-141 1-7.5 degree 'D' section of 24in RCP Median D 17,3452273.875,5258315.709,928.897,PTP27 STA 842+00.00 DR-601 Outlet of 24in RCP Median Drain 18,3452260.074,5258315.845,928.439,PRO STA 842+00.00 DR-201 Outlet end of apron 24in RCP Median Drain	orain +13.825 RT
19,3452238.993,5258576.064,919.750,PRO STA 844+50.00 DR-201 outlet end of apron 42in RCP PHASE 1 20,3452246.992,5258575.985,919.968,PIP28 STA 844+50.00 DR-601 42in RCP PHASE 1 21,3452410.917,5258574.379,924.436,PIP28 STA 844+50.00 DR-601 42in RCP PHASE 1 22,3452410.917,5258574.379,924.436,PIP29 STA 844+50.00 DR-601 42in RCP PHASE 2 23,3452500.912,5258573.497,926.888,PIP29 STA 844+50.00 DR-601 42in RCP PHASE 2	Discription
(III	۲

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 feature will be PIP which is the survey feature for pipes. To make each feature unique, add a number to the feature so that the application knows what features points should be connected.

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

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.

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	
	*
191,3452379.584,5254394.771,943.340,LIN7 CL of type M dike at STA 802+80.00	=
192,3452346.145,5254414.801,940.584,PRO_STA 803+00.00 DR-201 Inlet end of apron 24in RCP Median Drain	=
193,3452340.020,5254414.832,939.458,PIP22 STA 803+00.00 DR-601 Inlet 24in RCP Median Drain	
194,3452248.291,5254415.294,934.622,PIP22 STA 803+00.00 DR-601 Outlet 24in RCP Median Drain	
195,3452242.166,5254415,325,934,300,PRO STA 803+00.00 DR-201 Outlet end of apron 24in RCP Median Drain	
196.3452179.936.5255740.655.930.942.PRO STA 816+25.00 DR-201 Outlet end of abron 36in RCP PHASE 1	
197,3452187.936,5255740.615,930.988,PIP23 STA 816+25.00 DR-601 Outlet of 36in RCP PHASE 1	
198,3452395.934,5255739.568,932.180,PIP23 STA 816+25.00 DR-601 Inlet of 36in RCP PHASE 1	
199,3452395.934,5255739.568,932.180,PIP24 STA 816425.00 DR-601 Outlet of 36in RCP PHASE 2	
200.3452521.932.52555738.933.932.902.PTP24 STA 816+25.00 DR-601 Inlet of 36in RCP PHASE 2	
201.3452521.932,5255738,933,932,948,PR0 STA 816425,00 DR-201 Inlet on of apron 361n RCP PHASE 2	
202,3452362.023,5256714.769,946.846,PRO_STA_826+00.00_DR-201_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	
204,3452266.133,5256715.738,941.293,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	
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	
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,L195 CL of type M dike at STA 836+20.00	
214,3452283.679,5258314.634,939.565,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 24 in 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 +13.825 RT	
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	
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	
224,3452508.912,5258573.419,927.106,PRO STA 844+50.00 DR-201 Inlet end of apron 42in RCP PHASE 2	
225,3452391.414.5259714.625.923.846.PRO STA 856+00.00 DR-201 Inlet end of apron 24in RCP Median Drain	
226,3452385.270,5259714.685,922.924,PIP30 STA 856400.00 DR-601 Inlet of 24in RCP Median Drain	
227,3425307.394,5259715.448,921.465,PIP30 STA 856400.00 DR-601 IIIE OF 241n KCF Median Drain	
228,3452301.269,5259715.508,921.350,FRO STA 856400.00 DR-201 Outlet of 2411 KCF Median Drain	
229,3452372.283,5259734.565,926.610,LINIO CL of type M dike at STA 856+20.00	
230,3452422.898,5259734,565,926.610,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	
A III III III III III III III III III I	

Once the input file is complete then it can be loaded in the application file. <u>CW04 Loading ASCII Graphics Input File into ORD File</u>.

Loading the ASCII Graphics Input File into ORD File

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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 Designer file. With the file open, go to the Models dialog box and select the STR info to make it the active model.

🗇 Mode	els				—	×
	<u>()</u>					
Туре	2D/3D	Name	Description	券	Cell Type	Design File
ပ		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.



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		
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M 🔎		- >
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🥒 🖊 bridge iso		
✓ ✓ dsnOpenR		
ML pipes.t		
New File sv		
	0206_0118_DOT_SPN fixed.dgn	-
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Application:	All Applications	
Selected Documents	Add Remove	
Name		Fo
< <u> </u>		4
		OK 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 ASCI graphics input file are loaded and the correct location is verified, then start creating the structures.

How to place Box Culverts with the Drainage and Utilities tools Connect Edition

These instructions were created July 2023. These instructions were created with:



OpenRoads Designer CE - 2021 Release 2 Update 10 Version 10.10.21.04

Reference everything that will be used to design the structure, all the source information that will be needed and/or wanted displayed on the TSL sheet in the plan view. The TXT_CCRRRPPP.dgn file from the Design folder will be needed to get the station and tick marks for the alignment. For more information on this, please refer to <u>CW01_Setting up ORD File for Drainage Design</u>.

Once the invert coordinates of the RCB to be modeled are determined, there are two options to place it. Place nodes with civil AccuDraw or ASCII graphics. The method used in these instructions will be the ASCII graphics file. Refer to <u>CW04_Loading_ASCII Graphics Input File into ORD File</u> for the instructions on importing this information.



Once the points and lines from the ASCII input file are loaded, then verify that the locations are correct. At this point, you are ready to start creating the structures.

Open the correct model that the RCB will be modeled in and reference in the STR info model.

For this example, a CIP RCB will be modeled so it will be placed in the file named

ORD_CCRRRPPP_DOT_STR_CIP_ZZZ.dgn. Refer to the <u>CONNECT Seed Files</u> and the <u>CONNECT Models</u> for more information on correct file naming and structure of the files. The modeling should always be done in the Bridge folder.



In the Default 2D model, create the structures.

Note: Creation of the structures needs to be done in the 2D model not the 3D model.

Activate the utility model by clicking on the Place Node tool on the Drainage and Utilities workflow on the Lay out tab.



A warning will display.



Click Yes button. This will create the utility model database that will store all the utility information.

Next, start placing the headwalls. With the STR info model referenced to the CIP model, select the Place Node tool.



Then select the feature of the node to be placed. For this example, place a P 06 x 03 CIP SGL PW 0

Use the description field from the ASCII file to fill in the Name Prefix.

06,7450175.351,17517388.285,1172.450,PRO STA 190+72.65 Inlet end of apron 6ft x 3ft Single RCB -63.587 LT Remove existing headwall to face of parapet Extend 19' RT ditch to inlet. Design#0225

107,7450186.351,17517388.179,1172.450,PIP3 STA 190+72.65 Inlet 6ft x 3ft Single RCB -52.587 LT

108,7450205.350,17517387.995,1172.450,PIP3 STA 190+72.65 Inlet face of parapet of existing 6ft x 3ft Single RCB -33.587 LT

109,7450261.877,17517387.447,1172.340,PIP4 STA 190+72.65 Outlet face of parapet of existing 6ft x 3ft Single RCB +22.886 RT

110,7450279.866,17517387.273,1171.732,PIP4 STA 190+72.65 Outlet 6ft x 3ft Single RCB +40.932 RT

112,7450290.866,17517387.166,1171.732,PRO STA 190+72.65 Outlet end of apron 6ft x 3ft Single RCB +51.932 RT Remove existing headwall to face of parapet Extend 18' LT ditch to Outlet. Design#0225

It should look something like this:

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	ß	Place Node	- 0	×
		Feature		^
	Feat	ture Definition	P_06x03_CIP_SGL_PW_0	\sim
	Nam	ne Prefix	STA 190+72.65 Inlet end of apron 6ft x 3ft Single RCB -63.587 LT	
		Elevation		^
		Elevation is the Invert		
	\checkmark	Elevation	1172.450	
		Vertical Offset	0.000	
-		Baseline Referenc	e 🖓	^
2	Base	eline Reference		
		Rotation		^
		Rotation Mode	Absolute	
		Rotation	N90°00'00.0"E	

Once that is set, then move the cursor to the 2D view. It will prompt to Select Reference Element or to Reset to Type an Elevation. Reset and type the elevation.



For this example, use 1172.450, the invert flowline elevation of the design structure. Then, hit the enter key and it will lock this elevation.





Snap to the ASCII graphics to place the apron or node.

Data point to accept it and it will prompt to select which rotation mode.

For this example, use the absolute mode.

Select Rotation Mode Rotation:Rotation Mode Absolute	
	\times
Rotation:Rotation Mode Absolute	Select Rotation Mode
	Rotation:Rotation Mode Absolute

Data point again and the apron will rotate until the data point to accept the rotation is entered.



Snap to the ASCII graphics to set the rotation to the PRO graphic from the ASCII input. Then data point to accept.

Once it is done placing the node, hit the escape key to exit the tool.

It should look like this:



Repeat this on the other end and/or at any vertices along the conduit using the appropriate node in each location.

Keep in mind, that the elevation typed in is the invert elevation not the ground elevation that the software is asking for.

Hint: If a bad elevation is used, look at the node in the 2D view and select it with the element selection tool. Bring up the properties of the element and edit the invert elevation to match the design invert elevation.





This will correct the elevation placement.

Once nodes are placed at each end of the structure, then connect the nodes with the appropriate conduit. To do this, select the place conduit tool.



Then select the feature that is needed to model the structure.



For this example, use the Proposed CIP Box Culverts Single.

Use the description field from the ASCI file and place it in the name prefix field. Then select the size of the structure in the description field.

- 78- E.I		
	🔏 Place Link Betwo	een Nodes — 🗆 🗙
	Curve Variabl	es 🔺
	Pull	0.025
	Segment Length	2.440
	Parameters	*
	Slope	0.00%
	Feature	^
	Feature Definition	Proposed CIP Box Culverts Single 🗸 🗸
_	Name Prefix	STA 190+72.65 Inlet 6ft x 3ft Single RCB
₩ - ⁴ - ₩	Туре	Conduit Catalog
	Description	06 x 03 RCB CIP Single Span
		\sim

Select the inlet node to start from and then select the next node along the structure.

It should look something like this:



Turn on the reference COR files and see how the drainage design correlates to the Road Designs earth work and grading design.

-6	Element Selection	- 🗆 🗙		
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If everything looks good, then proceed to making the TS&L sheet of the structure.

Refer to CW06 How to Create Culvert TSL Sheet and Annotate Structures

How to make Culvert TSL Sheet and annotate the structures

These instructions were created July 2023 These instructions were created with:



OpenRoads Designer CE - 2021 Release 2 Update 10 Version 10.10.21.04

This is the step in the workflow where the Create Drawing dialog to automate the drawing and sheet model creation and place the views in them is used.

To create a Culvert TSL sheet, open the DGN file. This example will use the SHT_14030182_DOT_0225_FHWANO_CIP_Z07.dgn

For proper file naming please refer to <u>CONNECT Seed Files and Naming Conventions</u> and <u>CONNECT</u> <u>Models and Naming Convention</u>.

Note: To do this properly, establish the Design numbers for each design to name each sheet and named boundary correctly. Request design numbers and Asset ID numbers, if applicable, before proceeding with these instructions.

Note: Keep in mind that this process is for B01 work and not B02 work. B01 event work is for RCBs and other structures that will require Final Design detailing done to them. If designing crossroad pipes, that is B02 work and sheeting is done differently. Please refer to the <u>PW workflow documents</u> for instructions.

Rename the Default 2D model to Plan Design 0225 CIP model.



Reference the corresponding structure model file under the Bridge folder that goes with that sheet file.

For this example, ORD_14030182_DOT_STR_CIP_Z07.dgn



Set to Live Nesting with Nest Depth of 3

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4			PW_W	ORKDIR:	1648147	14030	0182_GEO	_ML030.dgn		Default	Ho	rizontal curve	Hori	Coincident - World	Wireframe	Wireframe	×	\sim	\checkmark	
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S <u>c</u> ale	1.0000	0000	00		: 1.000	000000)	<u>R</u> otati	on 00°00'(00" (Offset <u>X</u>	0.000		<u>Y</u> 0.000						
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Georef	erenc	ed:	No		•															

Next rotate the view in the 2D Model into the orientation that is needed to be displayed on the TSL sheet.

It should look something like this:



Next, under the OpenRoads Modeling workflow, select the Named Boundary tool.

Note: Working in a Multi-Model View, be sure to have the 2D view active when placing the boundary in the 2D view. Also make sure to have all the references turned on in the 3D view for the information to properly display on the plan sheet.

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	÷H-	Geographic	Primary	/ Selection	Clip	Saved Views	🕞 Tables	Notes	Т	ext 🗔	Annotations 5	Named Boundaries 🕞	Drawing Scales

Selecting the Named Boundary tool will open the Place Names Boundary dialog box, select **From Drawing Boundary** option at the top.

C Place Named Bour	ndary				
	R 🖓 🏢 🔇 🖊			• 💌	 View 2, CULVERTS-3D □ → 和 ☆ → ↓ ① ● ○ ①
Drawing Boundary:	Full Size Sheet	From Drawing B	oundary,		
<u>N</u> ame:	Untitled	A drawing bour	ndary is a sl	ot on a sheet	model that will contain the drawing
<u>D</u> escription:					
Detail Scale:	Full Size 1 = 1	-			
Group:	(None)	_			
	📄 Create Drawing				

In the From Drawing Boundary pull down, select the sheet seed that will best fit the desired output.

The first Drawing Boundary needed is the **TSL CUL Plan.** This will place the traditional plan view and will leave space on each side of the plan view for extra notes.

The second Drawing Boundary needed is the **TSL BRG Plan**. This will place a plan view that will cover the full width of the TSL page and is intended to be used in the bridge TSL creation process.

Decide what plan view is ideal for the design and sheet layout. For this example, use the TSL CUL Plan boundary.



In the **Name** field, name it the County number, Design number and Situation Type of structure.

For this example, it will be 0225 Situation CIP.

🔏 Place Named Bo	undary	—		×
	A 🖓 🏢 🕅 .	/ 🖊	[]	1
Drawing Boundary:	TSL CUL Plan			•
<u>N</u> ame:	0225 Situation CIP			
<u>D</u> escription:				
Detail Scale:	Full Size 1 = 1			•
	•••		\triangleright	
Group:	(None)			•
	🗹 Create Drawing			

In the **Description field**, describe the structure.

For this example, use CIP Single 6x3 RCB.

🔏 Place Named Bo	undary — 🗆 X
	A 🖓 🏢 資 🖊 🖊 💢
Drawing Boundary:	TSL CUL Plan 👻
<u>N</u> ame:	0225 Situation CIP
Description:	CIP Single 6x3 RCB
Detail Scale:	Full Size 1 = 1
Group:	(None) 👻
	Create Drawing

Select the detail scale of 1'' = 20'.

🔏 Place Named Bo	undary —		×
	R 🖓 🏢 資 🖊 🧧	1	
Drawing Boundary:	TSL CUL Plan		•
<u>N</u> ame:	0225 Situation CIP		
<u>D</u> escription:	CIP Single 6x3 RCB		
Detail Scale:	1"=20'	-	-
Group:	(None)		-
\rightarrow	Create Drawing		

Now place the boundary. It will appear at the end of the cursor.

Note: It may be preferred to place it on the outer edge of the structure layout and then move it to the correct location to ensure that the center of the plan view detail on this sheet will be at the centerline of the structure = centerline of the roadway. Move the boundary before making the drawing model and sheet. Make sure to <u>not</u> have "Create Drawing" toggled on so that the named boundary can be moved after it is placed to enable an ideal position in relationship to the structure. Then the drawing and sheet model will be created. This is what will be done in the following example. If there is confidence in the initial placement of the boundary, have "Create Drawing" toggled on and skip the next few steps after placing the boundary.



To move the boundary after it is placed, use the Element Selection tool and select the boundary. Use the move command to move the boundary to the position that is needed. Once placed, then select the Named Boundaries tool to open the dialog box.



Select the boundary that was created and right click on it. Select the **Create Drawing** option.



This Create Drawing dialog box will open. The name will be filled out based on the name of the boundary. For this example, used STA 2179+27.00).

📢 Create Drawing		×
Name:	0001 Situation CIP-1]
Drawing Seed:	TSL 👻	
View Type:	Detail	
Discipline:	Civil	
Purpose:	TSL	
	Create Drawing Model	
Seed Model:	lowa_DrawingSeed.dgnlib, TSL CUL Plan]
Filename:	(Active File)	💼 🖪
A	1"=20' -	
	Create Sheet Model	
Seed Model:	lowa_DrawingSeed.dgnlib, TSL CUL [Sheet]]
Filename:	(Active File)	🗇 🖡
Sheets:	(New) 🔻	
A	Full Size 1 = 1	
Drawing Boundary:	TSL CUL Plan 👻	
Detail Scale :	1"=20' (By Named Boundary) 🔹	
	Add To Sheet Index	P
	Make Sheet Coincident	
	Replicate Drawing in Sheet File	
	🗹 Open Model	
	<u>о</u> к	Cancel

Next, ensure the scales are set correctly for the sheet.

1. Under the Create Drawing Model section set this to 1"=20'. The scale is set to match the scale used when referencing the Drawing Model details into the Sheet Model.

2. Under the Create Sheet Model section set this to Full Size 1 = 1 and ensure that the Detail Scale is set to 1'' = 20' (By Named Boundary). The scale is set to match the scale used when referencing the Drawing Model details into the Sheet Model.

Toggle on Open Model, if desired. Add to Sheet Index may be toggled on also. Sheets may be added to the Sheet Index later in the plan sheet development process.

🞻 Create Drawing	×
Name:	0001 Situation CIP-1
Drawing Seed:	TSL 👻
View Type:	Detail
Discipline:	Civil
Purpose:	TSL
	Create Drawing Model
Seed Model:	Iowa_DrawingSeed.dgnlib, TSL CUL Plan
Filename:	(Active File) 💼 📮
	1"=20' 👻
	Create Sheet Model
Seed Model:	lowa_DrawingSeed.dgnlib, TSL CUL [Sheet]
Filename:	(Active File)
Sheets:	(New) 👻
A	Full Size 1 = 1
Drawing Boundary:	TSL CUL Plan 👻
Detail Scale :	1"=20' (By Named Boundary) 🔻
	Add To Sheet Index
	Make Sheet Coincident
	Replicate Drawing in Sheet File
	🗹 Open Model 🚽
_	<u>O</u> K Cancel

If everything is correct, then click OK.

This will create the plan sheet.

It should look something like this:



Situation Plan

Next, go back to the Multi-Model View to make the Longitudinal Cross Section for the sheet.



It is recommended to place a guideline for placing this cut. Work in the 2D view.

First set the symbology to level Draft_DNC which means Draft Do Not Construct and the class to Construction. The guideline will not show on the sheet and will appear as part of the design.

۶	None	* Draft_DNC	*		G
	0 * 50 *	🔄 0 🔹 💽 0 🔹 🖓 0	٣	U Con:▼	Explo
		Attributes		Primary	
ବ୍	View 1, Plan Design	0225 CIP		Constructio	
Explo	⊡ - Ø 🎘 - ₹	🗩 🔎 🎦 🔂 🔁 🖬		F 🔍 🔁	

Use the place smart line tool to place the guideline.



Start by placing the line at the calculated invert at one end of the structure then ending it at the other invert. The purpose of this is to ensure cutting the section at the true center of the structure.



🔏 Place SmartLin	e – – X	\bigcirc	/
Segment: Vertex: Radius:	Lines ▼ Sharp ▼ 1.000 ✓ Join Elements ✓ Rotate <u>A</u> ccuDraw ✓ Start in <u>J</u> ine mode		
	0		

Use the Extend line tool to stretch the line past the plan view name boundary.



It should look something like this:



Next, make the Longitudinal Cross Section for the sheet using the **Civil Cross Section by 2 Point** boundary. This tool is also located on the Place Named Boundary dialog box.

🔏 Place N	amed Boundary Civil	Cross Section 2 Points		_		×
		ぺ√⊇≡≬	2			
	Drawing Seed:	(none)	hờ Ciu	vil Cros		n 2 Point
	Group:	(New)		ni cros	s section	12 FOIL
	Name:	Untitled				
	Description:					
Ve	ertical Exaggeration:	1.000000	1			
	Top Clearance:	40.000000	1			
\checkmark	Bottom Clearance:	20.000000				
Elevat	ion Datum Spacing:	5.000000				
		Backward Facing		1		
		Create Drawing				
		Show Dialog		1		

Select a **Drawing Seed.** For this example, use the XS 20 Scale seed to make a 1" = 20' scale cross section.

🔏 Place N	lamed Boundary Civil	Cross Section 2 Points – 🗆	×
		쨧▦ो╱┵┚┇	
	Drawing Seed:	XS 20 Scale 🖕 🗸	
	Group:	(New) 🔻	
	Name:	Untitled	
	Description:		
Ve	ertical Exaggeration:	1.000000	
\checkmark	Top Clearance:	40.000000	
\checkmark	Bottom Clearance:	20.00000	
Elevat	tion Datum Spacing:	5.000000	
		Backward Facing	$\sum_{i=1}^{n}$
		Create Drawing	
		Show Dialog	

Next identify the path element. For this process, it will be the roadway horizontal alignment that intersects the structure shown on the sheet.

Note: Selecting the alignment will also set the Group. It is very important to set this so that in a large corridor project the cross sections can be placed on their own sheets when the drainage design is complete. To identify the path element, select it in the 2D view.



The **Group** should be named the same as the alignment.

🔏 Place Named Boundary C	ivil Cross Section 2 Points 🛛 🗖	×
	A 🖓 🏢 🕅 🖊 🗇 🎵	
Drawing Seed:	XS 20 Scale 👻	
Group:	ROWMLA30A	_
Vertical Exaggeration:	1.000000	
Top Clearance:	40.000000	
Bottom Clearance:	20.00000	
Elevation Datum Spacing:	5.00000	
	Backward Facing	
	Create Drawing	
	Show Dialog	

Next, identify the start point.

Snap to the intersection point of the structure centerline and the edge of the plan view boundary placed earlier.



Then, identify the end point.

Snap to the intersection point of the structure centerline and the edge of the plan view boundary placed earlier.



It will prompt to Accept or Reject.



Once everything is set correctly, Data point in the plan view to accept the settings and this will open the Create Drawing dialog box.

📢 Create Drawing		×
Mod One Sheet Per Dg		•
View Type:	ROWMsA30A - A 190+72.65-1 XS 20 Scale Civil Cross Section Civil Section View	
	Drawing Model ROWMLA30A - A 190+72.65-1 Cross Section Sheet Seed 20 Scale.dgnlib, (Active File) 1"=20' XS Grid w/ Annotation 20 Scale	•
Filename: Sheets:	Sheet Model Create Sheet Model ROWMLA30A - A 190+72.65-1 Cross Section Sheet Seed 20 Scale.dgnlib, (Active File) (New) Full Size 1 = 1 XS 20 Scale 1"=20'	•
Detail Scale :	 Add To Sheet Index Make Sheet Coincident Open Model 	Cancel
Select an **Annotation Group** and select the **Sheet** that the section will be placed on. Toggle on Open Model.

When adding a detail/cross section to an existing plan sheet, the Add to Sheet Index option is grayed out. When creating a new plan sheet, the Add to Sheet Index option will appear selectable.

📢 Create Drawing		×
Mode: One Sheet Per Dgn:	Cross Section	•
Drawing Seed: X View Type: C	OWMLA30A - A 190+72.65-1	
	ection View awing Model	
Vodel Name: R Se d Model: C File ame: (/	OWMLA30A - A 190+72.65-1 ross Section Sheet Seed 20 Scale.dgnlib, Active File)	•
Annotation Group: X	"=20"	
	eet Model] Create Sheet Model	
Model Name: R	OWMLA30A - A 190+72.65-1	
Seed Model: C	ross Section Sheet Seed 20 Scale.dgnlib,	
Filename: (A	Active File)	
SHyets: 02	225 Situation CIP [Sheet]	
Fi	ull Size 1 = 1 ▼	
Drawing Boundary: (N	lew) 🔻	
Detail Scale : 1"	'=20' ▼	
	Add To Sheet Index 🕼 Make Sheet Coincident Open Model <u>O</u> K Ca	ancel

Click OK.

This will place the cross section on the sheet as the Longitudinal Cross Section. It will appear in the center of the sheet.



To move it to the proper placement, open the Reference dialog box. Then select it in the list, right click and select move. This is a reference so the reference move tool is used.



Data point somewhere outside of the sheet and with the AccuDraw compass locked vertically, move it up into the correct position.



The sheet should look something like this:

Next, annotate the structure in the Plan View drawing model and in the Longitudinal Cross Section drawing model.

For this example, start with the Longitudinal Cross Section drawing model.



Turn off some of the automatic annotations of this Longitudinal Cross Section to make room for some of the information that needs to be displayed.

To turn off some of the automatic annotations, right click and hold to bring up the context sensitive menu.



Then select the Turn Level Off by Element option, click on the items not needed for the sheet.



It should look something like this:

When annotating a structure in the Longitudinal Cross Section, label these items listed below.

- 1. Design Cover.
- 2. Profile Grade Elevation.
- 3. Distance from centerline right.
- 4. Distance from centerline left.
- 5. Flowline Elevation at each critical point in the structure.
- 6. Structure description and any other unique items that need to be called out.
- 7. Total Distant Left and Right (if an offset baseline is need for that standard).
- 8. Also any other items that apply from the Preliminary Design RCB <u>Checklist</u>.

Some of this information is stored in the ASCII graphics input file. It is helpful to have that file open for the structure that is being annotated when doing this process. Copy and paste information from it to the Place Note tool to help save on typing.

ML and SR pipes from 1045 to 1389_4-7-21.txt - Notepad	>			- C
File Edit Format View Help				
481,3452553.930,5284214.405,908.825,PRO STA 1101+00.00 DR-201 Inlet en 482,3452560.052,5284214.321,908.656,PIP98 STA 1101+00.00 DR-601 Inlet 483,3452644.012,5284213.168,906.338,PIP98 STA 1101+00.00 DR-601 Outlet 484,3452644.012,5284213.168,906.338,PIP99 STA 1101+00.00 DR-601 Inlet 485,3452747.963,5284211.740,903.468,PIP99 STA 1101+00.00 DR-601 Outlet 486,3452754.085,5284211.656,903.299,PRO STA 1101+00.00 DR-201 Outlet e	of 24in RCP PHASE of 24in RCP PHASE of 24in RCP PHASE of 24in RCP PHASE	1 +82. E 1 -1. 2 -1.5 E 2 -10	432 RT 536 LT 36 LT 95.497 LT	
٢				
	Ln 1, Col 1	100%	Windows (CRLF)	UTF-8

Before starting to place annotations, some settings need to be selected. The first is to change the workflow to the Drawing workflow.

Note: This may be a user's preference because some users find it easier to locate the tools to annotate in this workflow. These tools are available on other workflows as well.



The second is to select the correct Element Template for placing the annotations.

Click on the Element Template pull down in the Attributes toolbox on the home tab.



Browse down to the Annotation Plan folder and select the Dimension Text Element Template.

Typical use of the options is:

Normal Text - Use for any notes that are not dimension leader notes.

Dimension Text - Use for all dimensions, leader notes and dimensional numerical values and text used in tables or fields. See tables used on Iowa DOT Culvert Barrel Details standard sheets as an example.

Header Text - Use for all headers and title blocks.

SubHeader Text - Use when Header and Normal text do not seem appropriate. An appropriate case would be the word Notes used when labeling a group of notes or instructions.



Next, select the correct annotation tool. This example will be for placing the Flowline Elevation at the Inlet end of the apron and the offset from centerline. Use the Place Note tool.



Selecting the Place Note tool will open the dialog box. Select the correct Dimension Style.

Vie	w 1, ML030 - 1101+00.00		
	🔏 Place Note	- 🗆 X	
	Dimension Style: Text <u>R</u> otation:	► IADOT Eng. Lead ► ► ► ► ► ► ► ► ► ► ► ► ► ► ► ► ► ► ►	
g	<u>L</u> ocation: <u>S</u> tart At: Hori <u>z</u> ontal Attachment:	 Lbl_ROW_Pln_Sta-Off_100 Lbl_SU_Plan_Node Lbl_XS_Elev Lbl_XS_Elev_Alignment_Name Lbl_XS_Off 	
9	20 -	└── _Lbl_XS_Off-Elev └── IADOT Eng. Angular Dim.	Angular Dimensions - English
g	000	HADOT Eng. Leader Note HADOT Eng. Linear Dim.	Leader Note Settings - English
8	380	→ IADOT Eng. Radial Dim. -220 -200 -180 -160 -140	Diameter, Radial, and Arcs - English ✓ -120 -100 -8 A Text Editor

For this example use the IADOT Eng. Leader Note style.

By selecting the correct Dimension Style and Element Template, this ensures the notes are placed with the correct settings. Once this is set, type in the note needed.

This is where the ASCII graphics input file may be used. With it opened to the specific structure, highlight the information needed to be placed and copy it from the ASCII graphics input file.

Vie File Home View Annotate	Attach Analyze Cu	irves Constraints Utilities	Drawing Aids C	ontent Mesh	Help
Coordinate Coordinate	A B Place Edit	$A^{-1}_{-} A^{ABC}_{A^{A}_{-}} A^{ABC}_{-}$	C Dimension → +	⊢ Ř ⊢ Place	$\overset{\circ}{\leftarrow} \overset{\circ}{\circ} \overset{\circ}{\circ} \overset{\circ}{\circ}$
from 1045 to 1389_4-7-21.txt - Notepad				- 🗆	× ^{put} [*] □ [*] tailing ⊑
v Help					
					^
0,5284214.405, <mark>908.825,PR0 STA 110</mark> 2,5284214.321,908.656,PIP98 STA 1				K I	
2,5284214.321,908.656,PIP98 STA 2,5284213.168,906.338,PIP98 STA 3					
2,5284213.168,906.338,PIP99 STA					
3,5284211.740,903.468,PIP99 STA					
5,5284211.656,903.299,PRO STA 110) LT	
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		Ln 81, Col 109 1	00% Windows (CRLF)	UTF-8	.::
940		Ln 81, Col 109 1	00% Windows (CRLF)	UTF-8	
940		Ln 81, Col 109 1	00% Windows (CRLF)	UTF-8	
		Ln 81, Col 109 1	00% Windows (CRLF)	UTF-8	
940 920 920		Ln 81, Col 109 1	00% Windows (CRLF)	UTF-8	
		Ln 81, Col 109 1	00% Windows (CRLF)	UTF-8	
		Ln 81, Col 109 1	00% Windows (CRLF)	UTF-8	

Then paste it into the text window.

Vie	w 1, ML030 - 1101+00.00									
	Place Note	<u> </u>	_		×					
	Dimension Style:	Horizontal Manual Terminator	g. Leadı ¥ ¥ ¥	>						
		<u>A</u> [<u>→</u>]								
							+			
	A Text Editor									
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	FL. ELV. 9 DR-201 In Offset +8	let end	of ap T	oron 2	24in RCP F	PHASE 1				

Snap to the appropriate point to locate the note and place the note.



Then repeat the same process to place all the annotation notes needed. When complete it should look something like this:



Once done placing the notes, then dimension the structure. Select the Dimension Element tool on the Annotate tab in the Drawing workflow.



unico	Drawing Aids Content	Wesh	ныр		
o ✓ Place Label	$\begin{array}{c c} \hline \\ \hline \\ \hline \\ \hline \\ \hline \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ $	Place Table	$\begin{array}{c} \bullet \bullet$	Place Active Cell	Hatch Area
otes	Dimensioning 🔤	Tables	Detailing 🕞	Cells 🕞	Patter
1	Clement Dimensioning	—			
t PHASE	 IADOT Eng. Linear Din Lbl_Prof_Sta-Elev Lbl_Prof_Sta_Partial Lbl_ROW_PIn_Sta-Off Lbl_SU_Plan_Node Lbl_XS_Elev Lbl_XS_Elev Lbl_XS_Off Lbl_XS_Off-Elev 	f_100	▼ >> D,		
	IADOT Eng. Angular D	Dim.	Angular Dim	ensions - English	
	IADOT Eng. Leader N		Leader Note	Settings - English	of ap
	IADOT Eng. Linear D	im.	R.		
	IADOT Eng. Radial Dir	n	Diameter, Ra	dial, and Arcs - Engl	ish 🗸

Next, select the correct Dimension Style. This example will use the IADOT Eng. Linear Dim style.

By selecting the correct Dimension Style and Element Template, this ensures the dimensions are placed with the correct settings.

Next, set the **Alignment** to True and the **Location** to Automatic. If Association is toggled on, it will make the dimension capable of auto correcting if the structure is adjusted.

🔏 Element Dimension	ing – 🗆 🗙
IADOT Eng. L	.inear Dim. 🔹 💗 🗈
Alignment:	True 🔻
Location:	Automatic 🔹
\searrow	
Start Extension: End Extension: Text Alignment: Text Frame: Prefix Text:	I ← ✓ → I ✓ Standard ✓ Box ✓ gi ✓
Suffix Text:	ø 🔹

It should look something like this:

Location

65 .AU



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Hydraulic Design

Next, annotate the Plan View portion of the TSL Sheet.

When annotating a structure in the Plan View, label these items listed below.

¥.∳

- 1. Station at centerline of structure = centerline of the alignment.
- 2. Station at Even Station tic marks before and after the structure.
- 3. Station of the outside corners of the proposed revetment.
- 4. Dimension distance from centerline left.
- 5. Dimension distance from centerline right.
- 6. Dimension to length of new structure.
- 7. Also any other items that apply from the Preliminary Design RCB <u>Checklist</u>.

Similar to annotating the Longitudinal Cross Section, make sure to select the correct Element Template for placing the annotations.

i III 🛮 III i



Browse down to the Annotation Plan folder and select the Dimension Text Element Template.

Normal Text	SheetText
-	Show 🔻
Search Templates	<u></u>
Recent Templates	
🍜 Normal Text	3
Templates	,
👂 📁 Headwalls RCB	▲
🔺 📁 Annotation	
🔺 📁 Plan	1
🥌 Normal T	ext
🥌 Dimensic	on Text
🥌 Header T	ext
🥌 SubHead	er Text
Þ 📁 Sheets	· · · · ·
👂 📁 Survey	
👂 📁 Auxiliary	•
🥌 Manage	

By selecting the correct Dimension Style and Element Template, this ensures the notes are placed with the correct settings.

It should look something like this:



Once all the annotation is complete, then place the North Arrow in the Plan View. Go to the Multi-Model View in the 2D Design model in the SHT file.



Then reset the rotation of the view to unrotated. Select the Rotate View tool at the top of the view.



Select the Unrotated Method.



This will set it so that the Design model will have North to the top of the view.

Next, choose the Place Active Cell tool on the Drawing tab in the placement toolbox.



It will open the Place Active Cell dialog box.

hace Activ	ve Cell		×
_		ngle RCB Parallel Wing 00°00'00.0" 1.000000 1.000000 Place as Shared Cel	A
Intera	lirror: ctive: atten:	 True Scale Horizontal Scale and Rotate Top Multi-line Offsets Dimension Values Annotations Association 	

Make the North Arrow cell the active cell. Click on the three dots next to the Active Cell field.

Step Place	ce Active Cell	-	×
A	Active <u>C</u> ell: Active <u>A</u> ngle: <u>X</u> Scale: <u>Y</u> Scale:	ngle RCB Parallel Wing 00°00'00.0" 1.000000 1.000000 Place as Shared Cel	A
Cale	<u>M</u> irror: Interactive: <u>F</u> latten:	 True Scale Horizontal Scale and Rotate Top Multi-line Offsets Dimension Values Annotations Association 	

It will open the Cell Library dialog box.

2				Selection	IOOIS *	· / · /	Y A I
		Attributes			Selection	F	Placement
				X Vie	w 2, CULVERTS-31		
S		* * 	Belace Active Cell		- 0		2 ~} () () ~
٥			Active <u>C</u> ell: Active <u>A</u> ngle:	ngle RCB Para 00°00'00.0"	illel Wing		
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	File 🔶		ht				
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		Headwall - 10x8 Single F	CB Parallel 0 CIP 3	BD Cell			THE
		Headwall - 10x9 Single F	CB Parallel 0 CIP 3	BD Cell			
		Headwall - 12x10 Single	RCB Paralle 0 CIP 3	BD Cell			
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		Headwall - 12x11 Single	RCB Paralle 0 CIP 3	BD Cell			No.
	<	Llaaduudlii 10010 Ciaala	DCD Davalla O CID C	>			

Click on the File menu to browse to the BridgeGeneralUseCell.cel file under PWMain\Documents\IowaDOTStandardsConnect\Configuration\Organization-Civil\IowaDOT_Standards\Cell\<u>BridgeGeneralUseCells.cel</u> and select the North Arrow cell.

🞻 Attach Cell Library			×
Select			
Folder			
Cell	~	+ 🔰 🗮 🔜 🔯	
193 II.~			
Document			
Name	O F	i 🔨	
🕮 BridgeDesManua	alCaddNotes	9	
BridgeGeneralUs			
Cross Section La	5	1	
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<	>		
Address:	pw:\\ntPwInt1.dot	.int.lan:PWMain	\Docun ~
Description:	Bridge Notes and	Misc Cells	
File Name:	BridgeGeneralUse	Cells.cel	
Application:	All Applications		~
Application	/ III / ppileadons		
Extension:	*.cel		\sim
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Open document as	read-only		12
		Open	Cancel

Then click on the Place Active Cell tool.

жc	ell Lik	orary: [c:\pw_work	\BridgeGeneralUseCells.cel]		—		×
File							
*			X	X			
		Name ^	Description	^	N		
5		HydaCulv	Hydraulic Data for Culverts				
5		InfoDes	Structure Design Information		1		
5		InfoPipe	Structure Pipe Information		A		
5		Location	Location Township Range Sectio				
5		LongitCrossSect	Longitudinal Cross Section Grid-				
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5		MVC	Minimum Vertical Clearance				
6		NorthArrow	North Arrow	-	Λ		
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6		RBLT	Recoverable Berm Location Table				
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Place Active Cell — 🗆 🗙		
Active <u>C</u> ell: NorthArrow		🔆 Ce
Active Angle: 00°00'00.0"		File
X Scale: 1.000000		*
<u>Y</u> Scale: 1.000000		
00+ Place as Shared Cell		e e
N <u>T</u> rue Scale		
00+0 <u>Mirror</u> : Horizontal ▼		
● Interactive: Scale and Rotate ▼		e e
Flatten: Top 🔻	Z	<u> </u>
Scale	- [Se de la companya de
Multi-line Offsets		S
Dimension Values		S
Annotations		e) e)
00+841 Association		

Place it in the Unrotated 2D design model within the plan view boundary.

This will make it appear on the sheet at the correct scale and true North Azimuth of the Design file.



Next, place any of the other notes that need added to this sheet model to properly convey the design intent of the structure.

In the plan view Drawing model, place the following cells.

1. Hydraulic Data.

🔆 Cell Li	brary: [c:\pw_work	\BridgeGeneralUseCells.cel]	– 🗆 X
File			
* -		×	
	Name ^	Description	
	BidItem	Bid Item & Estimate Outlines	
	BKFL1	Backfill for Dirt/Rock	
	BKFL2	Backfill for Granular Material	
	BSLT	New Berm Slope Location Table	le Undraulia Data
	CulvPipe	Pipe Structure Information	Hydraulic Data
	CulvRCB	RCB Structure Information	Drainage Area = ??.? Acre
	CurveData	Curve Data	$Q_{50} = ?,??? CFS$
	Erosion	Frosion Stone Pattern	HW Elev. = ????
	Granular 🛛 🧹	Granular Material Pattern	Stream Slope = $??.?$ Ft./M
	HydaBrg	Hydraulic Data for Bridges	
	HydaCulv	Hydraulic Data for Culverts	
	InfoDes	Structure Design Information	
	I-f-D:	Charles Dia - Information	×
<			

2. Site location.

*	Cell Lik	prary: [c:\pw_work	\BridgeGeneralUseCells.cel]					×
F	ile							
~ 추	* =		X	*	+ 6			
		Name ^	Description					
		HydaCulv	Hydraulic Data for Culverts		▶ +!	_		
		InfoDes	Structure Design Information		ocatio	n		
		InfoPipe	Structure Pipe Information	?	? (label rou	ite)		
		Location	Location Township Range Sectio	I	n City of ??		applic	able)
		LongitCrossSect	Longitudinal Cross Section Grid-		-??N R-??	W		
		LongitCrossSect	Longitudinal Cross Cross Sectior		Section ??			
		LongSect	Longitudinal Section - Profile Gr		? Township ? County			
		Model	45		HWA No. ?	?		
		MVC	Minimum Vertical Clearance		Bridge Maint		??	
		NorthArrow	North Arrow		sset ID No.			
		ProfileGrade	Proposed Profile Grade		atitude ??.1			
		RBLT	Recoverable Berm Location Table		ongitude -?	?.123	3456°	
<	\sim	Daviat Dui al ana	D					

3. Any other notes needed to convey the design intent of the structure. Also any other items that apply from the Preliminary Design RCB <u>Checklist</u>.



Once completed, it should look something like this:

The sheet model should look something like this:



Situation Plan

Next, enter the Control Point information on the sheet. This information is in the SHT_PS_CCRRRPPPZ00.dgn file in the PrelimSurvey directory in ProjectWise. Once the correct control point for the structure is determined, edit the text on the sheet model of the TSL sheet to add this information.

The last steps in completing the TSL sheet is the Title Block information and working with the Sheet Index in the IaDOT_WS file that is accessed thru the Project Explorer. Refer to the next chapter CW07 Editing Title Block Information on TSL Sheets and Printing

Editing Title Block information on TSL Sheets and Printing Sheets

These instructions were created with:



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

When using the Sheet Models in the Iowa DOT Bridge Bureau seed files, the Title Block and sheet border 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. Access the Sheet Index thru the Project Explorer. The Sheet Index can only be edited by one user at a time.



Project Explorer displays the Sheet Index as shown below.

Explorer	▼ # X
🔀 File	~
📦 Items	~
😝 Resources	~
🤮 OpenRoads Model	~
🕼 Sheet Index	^
🗘 👷 🔜 🔎 📲	
▷ 🕼 IaDOT_WS (5)	
Links	~
🖯 OpenRoads Standards	~
闫 Drainage and Utilities Model	~
😌 Survey	~

Next, open the Sheet Index for editing. Click on the Open Sheet Index for Edit 🗱 button.



Add the folders that the sheets will reside in. Typically, the process is to create a folder for each Structure Design Number.

Note: At this stage the design number may not be known for each structure, so name it something specific to the structure. Once the design number has been assigned then rename the folder. This example will use the Design Station of the structure. To add a folder, click on the structures folder so that it is highlighted and click on the create folder is button.





The folder will be added and named Untitled. To rename the Untitled folder, either right click and select Rename or edit it in the folder properties. Rename it the Design Number or the Station of the structure.



Once the folder is created for the design then add the sheets to it. 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 and select the DGN file the sheet is in thru the Select tab.

🞻 Add Sheet			
Select			
Documents			
Folder Bridae			
are num		1.1.1 *	
A NIA WAR	^		
	DOT 700 I		
	5		
Select Documents Folder Bridde ************************************			
Select Documents Folder Bridge ************************************			
	elect Documents Folder Folder Folder Folder Folder Folder Folder Folder Folder Folder Folder Folder Folder Folder Folder Folder Folder Folder Folder		
		O File Upd Folder File 8.dgn 11/2/20 10906 2: CULVERTS_X_Sec_Z08.d 11/10/2 10906 10; CULVERTS_Z08.dgn 11/10/2 10906 19; CTURES_FHWANO_Z08 e 11/15/2 10906 19; CULVERTS_Z08.dgn 6/15/20 10906 12; Valende ST_Z08.dgn 6/15/20 10006 12; Valende ST_Z08.dgn 4/02/20 10006 12; Valende ST_Z08.dgn 4/02/20 10006 12;	
Application:	All Applications	\vee	
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<pre></pre>	DT e 11/15/2 10906 4,9	16 KB Che ediedri ORD_CCRF	
Select Documents Folder Bridae ************************************			
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Folder File Name O File Upd Folder Common Comparison 11/2/20 10906 Comparison 11/2/20 10906 Comparison 11/10/2 10906 Comparison 11/11/2 Add Remove Sel			
Folder Polder Pile Polder Polder Pile Polder Pile Polder <li< td=""><td></td></li<>			
		OK Cance	
Documents Folder Bilde ************************************			

Click the Add button.

Click the OK button.

The list of available sheets will display. Select the sheet that will reside in this folder. 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.



In the Properties of the Sheet Model it will show if the sheet is part of a Sheet Index or not.

Example below is showing the Sheet Model is Not in a Sheet Index.



If the Sheet Model was in a Sheet Index then the Remove from Sheet Index option would be selectable.

O Moo							1	
) G E	🗳 🔲 🍸 🗙						
Туре	2D/3D	Name ^	Description	Sheet Number	*	Cell Type	A Design F	
?] ⊠ ™		Design Drawing Model			*	Graphic Graphic Graphic	c:\pw_w c:\pw_w	
		New Sheet Bridge	Bridge Plan Sheet/Title	000	Оре	n	w_w	
		New Sheet Culvert	Culvert Plan Sheet/Title	000	Remove from Sheet Index N Copy Add Link to Element Navigate to Sheet Index			
				-	Delet Rena Prop			

The image below shows the Sheet Model is in a Sheet Index.

roperties	· · · · · · · · · · · · · · · · · · ·
Models (1)	
▲ 📑 770423 Sht_005	
Border.dgn,	Border - Bridge
B OBM 77035	
	245_001_0425_040101_2001dg1,001dd10
Line Style Scale	
Update Fields Automat	
Sheet	
Show Sheet Boundary	True
Sheet Number	000
Sheet Number Sequence Number	1
Sheet Number Sequence Number Border Attachment	1 (None)
Sheet Number Sequence Number	1
Sheet Number Sequence Number Border Attachment	1 (None)
Sheet Number Sequence Number Border Attachment Sheet Size	1 (None) ANSI D
Sheet Number Sequence Number Border Attachment Sheet Size Height	1 (None) ANSI D 22.0000"
Sheet Number Sequence Number Border Attachment Sheet Size Height Width	1 (None) ANSI D 22.0000" 34.0000"
Sheet Number Sequence Number Border Attachment Sheet Size Height Width Sheet Unit	1 (None) ANSI D 22.0000" 34.0000" Inches

Right clicking on the Sheet Model it can be removed from the Sheet Index, if desired. Sheet Models may also be removed from the Sheet Index through the Sheet Index Explorer.

<u></u>) O E	🚣 🗖 🍸 🔀				
Туре	2D/3D	Name ^	Description	Sheet Number	🔆 Cell Type	🛕 Design Fi
B		770423 Sht_001	Estimate	000		c:\pw_wc
Cà		770423 Sht_002	Summary	000		c:\pw_wc
Cà (770423 Sht_003	General Notes	000		c:\pw_wo
Ŀ		770423 Sht_004	Situation Plan	000	-	, Fwo
Ŀ		770423 Sht_005	Site Plan	000	Open	_wo
Ľ4		770423 Sht_006	Detail Sheets	000	Remove from	Sheet Index -wo
리 이 철		Design			Сору	_wo
		Detail Model				_wo
S	<u> </u>	OBM_Model			Add Link to El	
r,	Û	Pier_Model			Navigate to SI	heet Index _wo
					Delete	
					Rename	
					Rename	
<					Properties	

The sheet will appear in the index as shown below.



Next, set the Index Properties at the index level. Click on the **IaDOT_WS** in the Sheet Index Explorer so that it is highlighted and open the Properties. Set the Bridge File Number, County, Letting Date, PIN Number and Project Number. Completing these values will fill out the corresponding text fields in the Border and Title Block of the plan sheet, as well as the corresponding text fields on the Title Sheet.

The 3 Project Location Lines and 3 ROW Project Number lines are used to populate text fields on the Title Sheet. The Index Properties will set these fields in **all** the sheets in this index.

Explorer	- 4 ×	Properties (Sheet Index)	- ₽ X
🔀 File	~	🔺 🔁 Link Tree (1)	
📦 Items	~)	🕝 IaDOT_WS (5)	
😝 Resources	~		
JopenRoads Model	~		
☞ Sheet Index	^		
		Index Properties	^
🔺 🔄 IaDOT_WS (😜		Bridge File Number 000000	
▷ 📁 Road		Contract ID ID County Polk\Story	
Structures (5)		Design Team	-
 Find the set Find the set 		FRA Number FRA # Letting Date Jan 01 2000	
		PIN 15-77-035-040-01	
Plan Sheets Design XXXX		Project Location Line Location Project Location Line Location	
TSL Plan Sheet STA 2179+27.00 (1)		Project Location Line Location Project Location Line Location	
TSL Plan Sheet STA 2165+70.11 (1)		Project Number IM-035-4(309)9513-77	
TSL Plan Sheet STA 2046+46.26 (1)		ROW Project Numbe 12345 ROW Project Numbe 56478	
TSL Plan Sheet STA 1970+98.75 (1)		ROW Project Numbe 98765 Work Type Type	
TSL Plan Sheet STA 1774+79.60 (1)		Sheet Numbering Controls	^
		Automatic Naming of On Increment 1	
		Inherit Naming Rule Off	
		Number of Digits 3 Sheet Number Prefix	
		Sheet Number Suffix	
😤 Links	~	Show Leading Zero Off Start Number 1	
🤮 OpenRoads Standards	~)	Total Sheets Count 5	
😌 Drainage and Utilities Model	~		
3 Survey	~		

Next, set the text fields that are design number specific for each structure. Select the folder created earlier for each structure in Project Explorer so that it is highlighted and open the Folder Properties.

Explorer	→ ₽ ×	Properties (Sheet Index) 🔻 🖣	Ψ×
K File	~]	🔺 📂 Folder Link (1)	
📦 Items	~	🏳 TSL Plan Sheet STA 1774+79.60	
🕞 Resources	~		
😌 OpenRoads Model	~		
Gereindex	^		
9		General	*
() 😫 🚘 📨 🗙 🔜 🛬		Folder Name TSL Plan Sheet STA 1774+79.60	
🔺 🛃 IaDOT_WS (5)		Folder Properties	*
👂 📁 Road		Bridge Design Team AAA\BBB\CCC	
Structures (5)		Bridge Project Number NHSX-092-9(007)-3H-58	
D D Title Sheet		County County Test Name Cross Section Road Name Road Name	_
V 🔛 Title Sneet		Design Number 2222	
👂 📁 Plan Sheets Design XXXX		Design Team Iowa DOT	
ISL Plan Sheet STA 2179+27.00 (1)		End Spans 10'-0"	
		FHWA or Asset ID Number 223344	
TSL Plan Sheet STA 2165+70.11 (1)		Interior Span 10'-0"	
TSL Plan Sheet STA 2046+46.26 (1)		Plan Sheet Description Description	_
		Skew and Direction 30 Degree RA Station 10+45.89	_
ISL Plan Sheet STA 1970+98.75 (1)		Turn-in Date Jan 01 2025	_
TSL Plan Sheet STA 1774+79.60 ())		Type and Size of Structure 1 Type and Size of Structure	1
		Type and Size of Structure 2 Type and Size of Structure	
		Sheet Numbering Controls	*
		Automatic Naming of Sh On	
		Increment 1	
😤 Links	~	Inherit Naming Rule Fro Off	
	×)	Number of Digits 1	
🔮 OpenRoads Standards	~	Sheet Number Prefix	
		Sheet Number Suffix	
🖯 Drainage and Utilities Model	~	Show Leading Zero On	
Survey	~	Start Number 1 Total Sheets Count 0	
- ourrey			

Edit the following Folder Properties:

- Bridge Design Team
- Bridge Project Number
- County
- Cross Section Road Name
- Design Number
- Design Team Use Iowa DOT or Consultant Name
- End Spans and Interior Span Culvert sheets will not use the Span fields.
- FHWA or Asset ID Number
- Skew and Direction (e.g. 30 Degree RA)
- Station of structure
- Turn-in Date
- Type and Size of Structure There are two fields for Type and Size of Structure.

Some of the text fields may not be used on every sheet.

Completing these properties will fill out the corresponding text fields in the Title Block on each sheet that resides in this folder. Each folder must be edited for the specific information that applies to each structure.



The Plan Sheet Title Block below shows all text fields.

The **Plan Sheet Description** and **Design Sheet No.** text fields are linked to the model properties of the sheet model.

🙆 Moo	dels							
<u></u>	0							
Туре	2D/3D	Name ^	Description	Sheet Number	∦	Cell Type	A	De
റ] ₪		Design			~	Graphic		c: \
		Drawing			\checkmark	Graphic		c: \
i 👘	Ũ	Model			1	Graphic		c: \
		New Sheet Bridge	Bridge Plan Sheet Description/Title	000				c:\
ß		New Sheet Culvert	Culvert Plan Sheet Description/Title	000				c: \

All other text fields in the Title Block are linked to the Sheet Index Folder Properties.

Once this information is set, stop editing of the Sheet Index. Click on the Make Sheet Index Read Only icon in Project Explorer. The Sheet Index can only be edited by one user at a time.



ProjectWise will notify the user to Check In the index. Click on the Check In button.

Check In		×
General Comment		
Documents		
Name	O File Upd Folder File Size Status File U Description	
✓ laDOT_WS.dgn	ws e 11/16/2 11850 77 KB Che ediedri IaDOT_WS	
<	>	
Folder: Proje	ects\7703504015\Bridge\ProjectResources\WorkSets	
Create new version	on during Check In	
Version:		
Check In	Update Server Copy Free Cancel	

Next, set the Sheet Title and Design Sheet Number by opening the Models dialog box to set these two text fields that are configured to read the model properties. The Sheet Title is reading the sheet model Description.



For this example, it is a Situation Plan sheet, and the Design Sheet No. is sheet 1.

Note: If all the values that are entered are not reflecting the same data on the sheet, use the Update All Fields tool. This will reread all the assigned text fields.



To print the TS&L sheet, use the Print Organizer. To access this tool thru the backstage, click on the **File** menu in the file the sheets are in.



The Print Organizer may also be accessed through the Sheet Index which will be covered in a future document.

🕼 Sheet Index 🔹
0 🕱 🗟 🦉
IaDOT_WS Open Print Organizer
P Road
▲ [₱] Structures
▷ 芦 Title Sheet
▷ 芦 Plan Sheet Design XXXX

The backstage will show the Print option, select Print.



Select Print Organizer.

1		
E	ot.int.lan:PWMain\Documents\Proje	cts\7703504015\Bridge\OBM_77035305_DOT_0724_041891_Z08.dgr
New	Print	
Open	Print	Print to a printer or to a file
Save		
Save As	Print Preview	Open the resizable print preview window
Update Server Copy		
Save Settings	Print to PDF	Print to a PDF document
Send Mail		
Close	Print Styles	Create, edit, and delete print styles
Tools	1	
Settings	🛬 Print Organizer 🔸	Print multiple files using Print Organizer
Properties		

In Print Organizer set the **Default Print Definition Name** and **Output File Names** expressions to use **<model name>** before printing the sheets to the PDF.

Select File menu.

Select Default Print Definition Name...

F	ile Luit view 1001s		_									
G.	New	Ctrl+N			~ ~	\sim	✓ 📮	-				
-	Open	Ctrl+O		View	View	Drint		Dene	Casla	X Cine	V Cine	X Ori
۵	Save	Ctrl+S	el	View	view	Print	Units	Pape	Scale	X Size	Y SIZE	X Ori
	Save As											
	Default Print Definition N	Vame										
	Output File Names		1									
c.	Add Folder to Set	Set	s the	default	express	ion for a	a print o	efinitio	n name			
€£	Add Files to Set											
	Add Active File to Set											
90	Print Preview											
	Printer Setup											
8	Print											
	Exit											

1		6	$\mathbb{P} \times$		~ ^	\sim	⊻ [≣	-									
Ontitled	Name		. Model						Scale	X Size	Y Size	X Ori	Y Ori	Rota	Mirror	Rast	De
		De	efault Pri	nt Defin	ition N	ame Exp	pression						×	(
			Expressi	on name	:												
			<source< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>\sim</td><td></td><td></td><td></td><td></td></source<>										\sim				
			<source <model r<="" td=""><td></td><td>></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>^</td><td></td><td></td><td></td><td></td></model></source 		>								^				
			<source <sheet n<br=""><print co<br=""><print co<="" td=""><td>file name umber> unter>-<s< td=""><td>source f</td><td>ile name</td><td></td><td></td><td></td><td></td><td></td><td></td><td>~</td><td></td><td></td><td></td><td></td></s<></td></print></print></sheet></source 	file name umber> unter>- <s< td=""><td>source f</td><td>ile name</td><td></td><td></td><td></td><td></td><td></td><td></td><td>~</td><td></td><td></td><td></td><td></td></s<>	source f	ile name							~				
		[Previe	ew Name	S												
										ОК		Can	cel				

The **Default Print Definition Name Expression** dialog box will display, select **<model name>** option.

Click the OK button.

Then select File menu again for the second setting.

Select Output File Names...

	1	Untitled.pset - Print Org	anizer											
	F	ile Edit View Tools												
		New	Ctrl+N			~ ~	\sim	- 1	. A					
	-	Open	Ctrl+O						-	<u> </u>				
	۲	Save	Ctrl+S	el	View	View	Print	Units	Pape	Scale	X Size	Y Size	X Ori	Y Ori.
15		Save As												
ы		Default Print Definition N	lame											
9		Output File Names												
	æ	Add Folder to Set		V.										
S	с р	Add Files to Set	Sets	the	express	sion for	output	file nan	nes					
r		Add Active File to Set			\									
	90	Print Preview			\									
		Printer Setup												
B	9	Print			_ \									
٦		Exit												
				1		<u>۱</u>								

Untitled.pset	t - Print C	rganizer						. –					-		_		
File Edit Vie	w Tools																
		_ \$			~ ^	\sim	<u> </u>										
- CINTITLED	Name	File N	Model	View	View	Print	Units	Pape	Scale	X Size	Y Size	X Ori	Y Ori	Rota	Mirror	Rast	De
		Out	put File	e Name	Expres	sion							×				
		E	xpressio	on name	:												
		<	sequeno sequeno	unter>-< ce>- <sou ce>-<sou ile name</sou </sou 	urce file urce file	name>	<model< td=""><td>name></td><td></td><td></td><td></td><td></td><td>^</td><td></td><td></td><td></td><td></td></model<>	name>					^				
		<	model n	ame> ïle name		lel name	>						v				
			Previe	w Name	es												
										ОК		Can	cel				

The **Output File Name Expression** dialog box will display, select **<model name>** option.

Click the OK button.

🌆 Untitled.pse	t - Print O	rganizer		-			_	_		×
File Edit Vie	w Tools									ſ
		📮 🗟 🗙		\sim \simeq [- ·					
- Untitled	Name	File N Model	View View	Print Units	Pape Scale	X Size Y Size	X Ori Y Ori	Rota Mirror	Rast	Desi Pe
			e Name Expres	sion			×			5
		Expressi	on name:				~			
		Expressi								
			nition.MasterMo	delName						
										,
		Previ	ew Names							-
						ок	Cancel			

Next, select the Add Active File to Set... option thru the File menu.

	Untitled.pset - Print Org	anizer		
	File Edit View Tools			
	New	Ctrl+N		
	Open	Ctrl+O		
E	Save	Ctrl+S	el View View Print Units Pape Scale X Size Y Size X Ori Y Ori Rota Mirror	Rast.
	Save As			
	Default Print Definition N	lame		
	Output File Names			
9	Add Folder to Set			
3	Add Files to Set			
	Add Active File to Set			
9	Print Preview			
	Printer Setup		Adds the active file to the print set	
6	Print			
	Exit			
			$\mathbf{\lambda}$	

The Create Print Definition dialog box will open to select the print style. Click on the browse button next to the Print style name.

Create Print Definitions	×
Input Files	
pw:\\ntPwInt1.dot.int.lan:PWMain\Documents\Projects\7703504015\Bridge\0	Add
	Remove
< >	
Print Definition Creation Options	J
Print style name:	
Manually Specified Options	Brows
ОК	Cancel

Then select the desired print style option from the Apply Print Style list. For this example use CLR_overrides_pdf_SheetModel.

Tile N Model	View View Print Units	Pape Scale					×
Input Files	Apply Print Style				×		_
pw:\\ntP	Select a print style to apply:					dd	11
	Print Style Name	File Name					_
	<pre></pre>	PrintStyles.d PrintStyles.d	-			move	
	&BW_pdf_SheetModel	lowaDOT_Pr	•	.dgnlib			
	<pre> «CLR_as_is_pdf_SheetModel</pre>	lowaDOT_Pr					
	<pre></pre>						
			interfice	agrino			
<							
Print Defin							_
Print styl							
						7	
Ma							
				Cancel			_
-			UK		U	ncel	

Click the OK button.


The selected print style should	display in the field as shown below.	Click the OK button.
---------------------------------	--------------------------------------	----------------------

Create Print Definitions	×
Input Files	
pw:\\ntPwInt1.dot.int.lan:PWMain\Documents\Projects\7703504015\Bridge\(Add	
Remove	
Print Definition Creation Options	
Print style name:	
CLR_overrides_pdf_SheetModel	
Manually Specified Options	
OK Cancel	

After the Print Organizer compiles the sheets with the model name output, adjust the print property setting for rasters. Currently the print styles are set to print raster images in grayscale. This will need changed in the Properties of the print styles to have the raster images print in color.

Select all the sheets to print, select Edit menu and select the Properties option.



The Properties dialog box will open. Select Advanced tab, then uncheck "Print raster in grayscale".

gar ols	nzer 710120s000a Properties	×
1	Main Advanced Fence Display Levels References	
	WorkSpace: lowaDOT_Standards	_
	WorkSet:	
	Color Options	_
τ	Color: True Color	
	Raster Options	_
	Print raster images	
	Raster Color: Raster quality factor: 50.0	
	Print raster in grayscale Printer resolution (dpi): 600	
	Print monochrome raster as-is Raster resolution (dpi): 300	
	Brightness: 0.0	
	Contrast: 0.0	
	PDF Property Publishing	_
	Include properties: None ~	
	Property filter file:	
	Update Options	_
	Update from design file Update print definition name	
	OK Cancel	

Click the OK button	Click	utton.
---------------------	-------	--------

Janua

710120s000a Properties	×
Main Advanced Fence Display Le	vels References
WorkSpace: lowaDOT_Standards	
WorkSet:	~
Color Options	
Color: True Color	
Raster Options	
Print raster images	
Raster Color:	Raster quality factor: 50.0
Print raster in grayscale	Printer resolution (dpi): 600
Print monochrome raster as-is	Raster resolution (dpi): 300
Brightness: 0.0	
Contrast: 0.0	
PDF Property Publishing	
Include properties: None	~
Property filter file:	
Update Options	
Update from design file	Update print definition name
	OK Cancel

The Print Organizer will display the sheets it will be printing to the PDF. Confirm the sheets needed to print are listed and click on the printer icon at the top of the Print Organizer.

Muntitled.pset - Print Organizer		⊳				-		×
File Edit View Tools								
Intitled Name	File Name	Model	View Group	View	Print Area	Units	Paper	Scale
TSL_77_0724_01 TSL_77_0724_01	СБМ_77035305_DOT_0724_041891_Z08.dgn	TSL_77_0724_01		View 1	Sheet	ft	11x17	2.0
TSL_77_0724_02	OBM_77035305_DOT_0724_041891_Z08.dgn	TSL_//_0/24_02	TSL_//_0/24_02	View 1	Sheet	ft	11x17	2.0
< >> <								>
				[≞] 11x17	_pdf.pltcfg	2 item	ıs (0 selec	ted)

Next set the destination of the PDF file. Click on the Browse button next to the Destination field.

	Print		×
11		onfiguration 11x17_pdf.pltcfg Bentley PDF printer driver Printer Setu	up
	Print Range —	Number of copies: 1	
		Create print file Single print job WorkSpaces\lowaDOT_Standards\WorkSets\laDOT_WS\out\Untitled.pdf Open print file after creation	Browse
		OK Cance	el

This will open the Select a Wizard dialog box. Select the No Wizard option.

🖊 Select a Wizard	×
Document Creation Wizards	OK Cancel

Click the OK button.

The Save Ouput File dialog box will open. Verify the folder is set to the correct location for the PDF. Then Name the PDF.

For this example, it is a bridge TS&L sheet so name it TSL_County #_Design#.pdf or TSL_77_0724.

Next, enter a short description so that users know that this is for the bridge over I-35 on NE 158th Ave.

Click the Save button.

Folder				Save
B01			Select	Cance
Document				
Name:	TSL_77_0724.pdf		•	
Description:	NE 158th Ave over I-	35		
File Name:	TSL_77_0724.pdf			
Format:	pdf		Eormat	
				2
Application:		Department:		
Acrobat PDF		<none></none>	~	

Click the OK button.

Print						×
Printer Driv	ver Co	onfiguration				
,)2 File na	ame:	11x17_pdf.pltcfg				
т	уре:	Bentley PDF printer driver			Printer Setup	
Print Range	e —		Copies			
() All			Number of co	opies: 1	\$	
O Selecti	ion					
Submit —						
		Create print file				
Submi	it as:	Single print job \sim				
Destina	ation:	ments\Projects\7703504015\B	ridge\Design Eve	nts\B01\TSL_7	77_0724.pdf	
		Open print file after creation	ı			
				ОК	Cancel	

Then Print Organizer will create the pdf of the plan sheets.

When closing, Print Organizer will display a message asking if the pset needs to be saved. This is optional.



Saving a pset may be helpful when choosing to reprint the set again. However, if sheets have been added or there are changes to existing sheets, then the existing pset will need to be edited. Sheets may need added to be included and the existing sheets with changes may need updated from design file to see changes. The recommendation is not to save the pset and just recreate a new one, as needed. This ensures all changes to the Sheet Models are read from the CADD file.

Entering Structure Information into Database

Once the cross sections are cut on each culvert and have been annotated as described in <u>CW06 How to</u> <u>Create Culvert TSL Sheet and Annotate 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\IowaDOT\IowaDOTProd uction\Organization-

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

This file should be copy 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	≠ Bridge	es&Structures : Datab	ase- W:\Highway\D	esign\CADD	Access	Brid	Diedrich, Eric		XX
File	Home	Create	External Data	Database Tools	Help	Q	Tell me w	hat you want	to do	
0	READ-ONLY		e has been opened re ges, save a copy of the		nly change c	lata in lii	nked tables.	To make	Save As	×
	N	<i>lcome</i>	ediedri to the	Bridge and	Culvert	Sche	dule Da	<u>tabase</u>		
			Enter Database	,	Ex	it Data	base			
										(

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.

File Hom		External Data	Database Tools				hat you wan	t to do		
READ-ONI		e has been opened n ges, save a copy of th		ily change da	ata in link	ed tables	. To make	Sa	ve As	
	Walcomo	ediedri to the	Pridao and	Culuart	Schod		tabaca			
	vveicome	ealean to the	e briage ana	cuivert s	scheu	ule Du	labase			
		Enter Database	e	Exit	t Datab	ase				
		Enter Database	e	Exit	t Datab	ase				
		Enter Database	e	Exit	t Datab	ase				
		Enter Database	e	Exit	t Datab	ase				
		Enter Database	e	Exit	t Datab	ase				
		Enter Database	e	Exit	t Datab	ase				
		Enter Database	8	Exit	t Datab	ase				

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	Microsoft A	Access Security N	otice	?	×				
e	A potential security concern has been identified.								
i 5	Warning: It is not possible to determine that this content came from a trustworthy source. You should leave this content disabled unless the content provides critical functionality and you trust its source.								
_	state in a source.								
=	File Path: C:\WORK\51034159_PINKS.accdb								
	This file might contain unsafe content that could harm your computer. Do you want to open this file or cancel the operation?								
	More information								
_			Open	Cano	cel	5			

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

	\$ · ∂ ·	• Bridge	es&Structures : Datal	base- W:\Highway\De	esign\CADD	Access\Bridges &	Structures Database\Brid
File	Home	Create	External Data	Database Tools	Help	✓ Tell me v	what you want to do
	<u>wa</u>	elcome	ediedri to the	e Bridge and e	_	Schedule De	atabase

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

	Bridges&Structures : Database- W:\High
\odot	Good morning
斺 Home	∨ New
🗅 New	
▷ Open	
	Blank database
Save As	
	🔎 Search
	Recent Pinned
	🗅 Name
	Bridges&Structures W: » Highwar » Design :
	Bridges&Structures W: >/Iighway > Design :
	W: » Highway » Design :
	IN PROGRESS Bridg W: » Highway » Design :
Feedback	Bridges&Structures C: » Project Work Dir » E
Options	Seed_Pink_Sheets.m

Access Options			? ×
General Current Database	General optio	ins for working with Access.	
Datasheet	User Interface option	15	
Object Designers	Enable Live Previe	0 we	
Proofing	ScreenTip style: Sh	ow feature descriptions in ScreenTips	
Language	Show shortcut	t keys in ScreenTips	
Client Settings	Disable hardware	graphics acceleration	
Customize Ribbon	Creating databases		
Quick Access Toolbar	Default file format for	r Blank Database: Access 2007 - 2016 💌	
Add-ins	Default database fold		Browse
Trust Center	New database sort or	rder: General - Legacy 👻	
	Personalize your copy	y of Microsoft Office	
	User name:	Diedrich, Eric	
	Initials:	DE	
	Always use these	values regardless of sign in to Office.	
	Office Background:	Calligraphy 👻	
	Office Iheme:	Colorful 🝷	
		ОК	Cancel

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

General Image: Comparison of the point of the poin
Object Designers Visit Office.com to learn more about protecting your privacy and security. Proofing Microsoft Trust Center Language Microsoft Access Trust Center Client Settings Microsoft Access Trust Center Quick Access Toolbar 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
Visit Onice Control learn more about protecting your privacy and secturity. Proofing Language Client Settings Microsoft Trust Center Customize Ribbon Quick Access Toolbar Add-ins
Microsoft Trust Center Client Settings Microsoft Access Trust Center Customize Ribbon 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. Add-ins Irust Center Contains security and privacy settings. Irust Center Settings.
Customize Ribbon The Trust Center contains security and privacy settings. These settings help keep your computer secure. We recommend that you do not change these settings. Trust Center Settings. Add-ins 1 1
Add-ins The Trust Center contains security and privacy settings. These settings help keep your computer secure. We recommend that you do not change these settings. Irrust Center Settings.

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

Trust Center		? ×
Trusted Publishers	Trusted Locations	
Trusted Locations		
Trusted Documents	Warning: All these locations are treated as trusted sources for opening files. If you change or add sure that the new location is secure.	a location, make
Trusted Add-in Catalogs	Path Description	Date Modified 🔻
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		
	la l	
	Path: C:\Program Files (x86)\Microsoft Office\Root\Office16\ACCWIZ\	
	Description: Access default location: Wizard Databases	
	Date Modified:	
	Sub Folders: Disallowed	
	Add new location Remov	∕e <u>M</u> odify
	Allow Trusted Locations on my network (not recommended)	
	Disable all Trusted Locations	
	C	K Cancel

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.	es. If yo	u
C:\Program Files (x86)\Microsoft Office\Root\Office16\ACCWIZ\		
Subfolders of this location are also trusted Description:	<u>B</u> rc	owse
Date and Time Created: 12/27/2021 7:22 AM	Ca	ancel

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

Microsoft Office Trusted Location	?	×
Warning: This Id _v ation will be treated as a trusted source for opening fil change or add a location, make sure that the new location is secure. <u>P</u> ath:	es. If you	
C:\WORK		
Subfolders of this location are also trusted Description:	<u>B</u> row	/se
Date and Time Created: 12/27/2021 7:22 AM	Can	cel

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 folder structure 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 to perform Export - Locks file, changes can be re-imported Image: 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.



A progress bar for exporting will display.

Exportin	g
	Receiving changes for '51034159_PINKS.accdb' (1/1)
_	1.62 MB transferred so far
	Cancel

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

1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
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 Fin	ish 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.



Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980) Yet (1980)		5 · ? ·	≠ IN PR	OGRESS Bridges&Str	uctures : Database- \	W:\Highway	\Design\CAD	Diedrich, Eric) -	9	$>_{\!\!\!\!\times}$
Project List Survey Records ^Create New Project File ^_Export to 104-3 _Export Schedule Sheet * Exit Database	File	Home	Create	External Data	Database Tools	Help	,∕⊂ Tell	me what you want to d	0		
Survey Records				Main	Menu						
Create New Project File P_Export to 104-3 Export Schedule Sheet Fxit Database				<u>□ Proje</u>	ect List						
P_Export to 104-3 O Export Schedule Sheet				<u>Survey</u>	<u>Records</u>					-	
► Exit Database				✓ Create New	/ Project File 🛛 👉						
r Exit Database				Export	to 104-3						
				Export Sch	edule Sheet						ß
				🖗 Exit Da	atabase						
	En anna M										×

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 $ ho$ Tell me what you want to do	
	<u>Create Pr</u>	oject File	
Project Number:		 File No. 	
Location		Pin No.	
Design Team		Station From	
Bridge Team		Station To	
Import Path			9
A		TrafficCount	
В			
BW		VPD_YR	
С			
Z		Received	
E		TaDasian	
M		ToDesign	
Т		ToFinalDesign	
X MW		NoDesigns	
CLEAR			
		NoPipes	
Road Typical		Designs	
Typical Date			
	<i>■<u>Save</u></i>	× <u>Cancel</u>	

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.

्र ् र Brid	ges&Structures : Dat	abase- W:\Highway\De	esign\CADD\Access	\Bridges&Structures.ac	Diedrich, Eric	\times
e Home Create	External Data	Database Tools	Help 🔎	Tell me what you want	to do	
		Create P	Project File	5		
		<u>ereute</u> r	<i>roject ne</i>	<u>-</u>		
Project Number	:		~	File No.		
Location				Pin No.		
Design Team				Station From		
Bridge Team				Station To		
Import Path					c	2
А				TrafficCount		1
В				VPD_YR		1
BW C						-
Z			\sim	Received		
E						
М				ToDesign		
T X				ToFinalDesign		
MW				NoDesigns		
CLEAR				NoPipes		
Road Typical				Designs		ī Ι.
Typical Date				-		- I
		Jave Save	× C	ancel		
			^ <u></u>	incer.		
View						

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

	<u>Create Project File</u>
Project Number:	 File No.
Location	Pin No.
Design Team	Station From
Bridge Team	Station To
Import Path	
B W Please from. Z E M T X MW CLEAR Road Typical	se select the pink sheet database you would like to import all records n
Typical Date	

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 ← ~	Ü	∽ Search WORK
Organize - New folder) - II (2)
🣜 Windows	^	Name
WORK -		51034159_PINKS.accdb
ediedri (\\ntdfs\HomeFolders\UserE) (P:)		
🛶 u (\\dot.int.lan\atscore) (U:)		
🛫 (W)DataStor (\\ntdfs) (W:)		
📌 Network		
LIIT004.44	~	< > >
File name: 51034159_PINKS.accdb	~	Access Databases (*.accdb) 🛛 🗸
Tool	s 🔻	OK Cancel

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 🔎	Tell me what you wa	nt to do
		<u>Create P</u>	roject Fil	<u>e</u>	
Project Number:	NHSN-034-	-8(159)2R-51		File No.	
Location			\mathbf{i}	Pin No.	21-51-034-010
Design Team		I		Station From	t
Bridge Team				Station To	
Import Path C:\\	WORK\5103415	9_PINKS.accdb		\mathbf{h}	٩
A				TrafficCount	
В					
BW				VPD_YR	
с					
Z				Received	
E					
M				ToDesign	
т				ToFinalDesign	
x				NoDesigns	
MW				-	
CLEAR				NoPipes	
Road Typical				Designs	
Typical Date					
		<u>■ Save</u>	×_(<u>Cancel</u>	

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).

Home Create	External Data	Database Tools	Help 🔎	Tell me what you war	nt to do	
		<u>Create Pro</u>	oject File			
Project Number:	NHSN-034-	8(159)2R-51	~	File No.		
Location	0.3 mi E of	Bus 34 Interchar	nge to 0.4 n	Pin No.	21-51-034-010	
Design Team				Station From		
Bridge Team				Station To		
Import Path C:\\	VORK\5103415	9_PINKS.accdb			۹.	
А				TrafficCount		
В						
BW				VPD_YR		
С						
Z				Received		
E						
M				ToDesign		
Т				ToFinalDesign		
X				NoDesigns		
MW				-		
CLEAR				NoPipes		
Road Typical				Designs		
Typical Date				-		
		<u>■Save</u>	× <u> Ca</u>	<u>ncel</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	int to do	
	<u>Create P</u>	roject File		
Project Number:	NHSN-034-8(159)2R-51	 File No. 		
Location	0.3 mi E of Bus 34 Intercha	ange to 0.4 n Pin No.	21-51-034-010	
Design Team	Holst\Ackerman 🔍	Station From		
Bridge Team		Station To		
Import Path C:\\	WORK\51034159_PINKS.accdb		Q.	
A		TrafficCount		
B BW		VPD_YR		
C				
Z		Received		
E M		ToDesign		
Т		ToFinalDesign		
X MW		NoDesigns		
CLEAR		NoPipes		
Road Typical		Designs		
Typical Date				
	<i>■<u>Save</u></i>	× <u>Cancel</u>		

ile	ち・ご・ Home	 Bridges Create 	&Structures : Data	base- W:\Highway\De Database Tools	esign\CADD\4 Help		Bridges&Structures.ac Tell me what you wa	Ve al h C	×	9	××
				<u>Create P</u>	roject	<u>File</u>					
	Project N	lumber:	NHSN-034-	8(159)2R-51		\sim	File No.				
	Location		0.3 mi E of	Bus 34 Interch	ange to O).4 n	Pin No.	21-51-034-010			
	Design Te	eam	Holst\Acke	rman			Station From				
	Bridge Te	eam	Claman\Di	edrich			Station To				
	Import P	ath C:\W	/ORK\5103415	9_PINKS.accdb					Q.		
	А						TrafficCount				
	B BW						VPD_YR				
	C										
	Z						Received				
	E M						ToDesign				
	Т						ToFinalDesign				
	Х						NoDesigns				
	MW CLEAR						NoPipes				
	Road Typ	bical					Designs				
	Typical D						Designs				
				Save		× Car	ncel				
				- <u></u>		<u></u>	<u>1001</u>				
n Vi											

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 need 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.



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·ð·	■ Bridges&Struct	ures : Database- W:\Highway\Design	\CADD\Access\Bridges &	& Structures Data	Diedrich, Eric		×
File Home	Create Extern	al Data Database Tools H	lelp 🔎 Tell me	what you want to do			
	LVERT SCHEDU 1-8(159)2R-51 f Bus 34 Interchange to 0	PIN NO 21-51-034-010	DESIGNER IN CH ROAD Holst\Ac DRAINAGE Claman\ TRAFFIC COUNT	kerman	A B BW SEE ROAD	C Z E DESIGN TYPICA	M T X L NO.
Present Structu	ire	/	-				
Design No.		Drainage Area 19.15	acres TerrainTy	pe:Rolling 🛹	Disposition o	f Present St	ructure:
Survey Station	414+91.90	Description 54"x289'					
Remove Apron	~	Remove Headwall To Face Par	apet	~			Sort C
PROPOSED STRU	CTURE						
Station:		Bedding Class:	~		DIKE		
Offset:		Proposed Camber DR102:		Control			
Kind:	~	Design Cover:		Left/Right			~
Size:	~	Pipe Class:	\sim	Location Statio			
Design No:		Length New Construction:		Top Elevation			
Design Q:		Proposed Apron In:		Туре			
Headwater:		Proposed Apron Out:					
Standard		Connection Type:	~				
DR	~	Flume Description:					
A		Grade:					
в		Flowline Left:		Apron Guard (DR2	213)		
c		Flowline Right:		Diaphragm (DR50	1)		
		Flowline Other		Tee Section (DR14	12)		
E		Flowline Other		Reducer			
		DR205 Inlet Apron Ton					
Record: I 1 of 2	No Fi	Iter Search					

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 Stru	cture				
Design No.			Drainage Area	19.15 ~ acres	TerrainTyp
Survey Station		414+91.90	Description	54"x289'	
Remove Apron	Both	\sim	Remove Headwa	all To Face Parapet	
PROPOSED ST	RUCTUF	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.

₽ \$ * ∂ *	, Bridges	&Structu	res : Datab	ase- W:∖I	Highway\De	sign\CAD	D\Acces	s\Bric
File Home	Create	Externa	l Data	Databa	ase Tools	Help	Q	Te
	CULVERT SC -034-8(159)2R-51 i E of Bus 34 Interc	L .	PIN NO	то	21-51-034-0 D	10	DESIG ROAD DRAINA TRAFFIC	H GE C
Present Struc	cture							
Design No.			Drainage	e Area	19.1	L5 v acr	es	Terra
Survey Station	414	+91.90	Descripti	ion	54"x289'			
Remove Apron		~	Remove	Headwa	all To Face	Parapet		
PROPOSED ST	Left Right							
Station:	Both		Bedding (Class:				
Offset:			Proposed	l Cambe	er DR102:			
Kind:		\sim	Design Co	over:				
Size:		\sim	Pipe Class	s:				
Design No:			Length No	ew Cons	struction:			
Design Q:			Proposed Apron In:					

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:\	— — — — — — — — — — — — — — — — — — —	ADD\Access\Bridges & Structures Data
File Home	e Create Extern	al Data 🛛 Datab	ase Tools 🛛 Help	ho Tell me what you want to do
PROJECT NO NHS	CULVERT SCHEDU N-034-8(159)2R-51 mi E of Bus 34 Interchange to C	PIN NO	21-51-034-010 O	DESIGNER IN CHARGE ROAD Holst/Ackerman DRAINAGE Glaman/Diedrich TRAFFIC COUNT VPD YR
Present Stru	icture			
Design No.		Drainage Area	19.15 v a	acres TerrainType: Rolling D
Survey Station	414+91.90	Description	54"x289'	
Remove Apron	~	Remove Headw	all To Face Parap	et 📉
PROPOSED ST	TRUCTURE			Left Right
Station:		Bedding Class:		Both
Offset:		Proposed Cambe	er DR102:	Control
Kind:	~	Design Cover:		Left/Right
Size:	~	Pipe Class:		 Location Station
Design No:		Length New Con	struction:	Top Elevation

For this exam	nle it is a 54-inc	n pipe and is being	replaced with a	new structure s	o select Both
I OI LIIIS EXAIII	pie, it is a 54-inc	i pipe and is being	s replaced with a i	new structure s	o select Doth.

						\sim	
🖬 🍤 🤆	🔍 🚽 Bridge	s&Structures	: Database- V	V:\Highway\[Design\CAD[\Access\	Bridges & St
File Hon	ne Create	External D	ata Data	base Tools	Help	Q	Tell me wh
PROJECT NO NH	D CULVERT S(ISN-034-8(159)2R-5 3 mi E of Bus 34 Inter	51	FILE NO PIN NO	21-51-034 TO	ŀ-010	ROAD	ER IN CHAI Holst\Acker Claman\Die OUNT
Present Str	ucture						
Design No.		D	rainage Area	19	0.15 v acre	es Te	errainType
Survey Statior	41	4+91.90 D	escription	54"x289)1		
Remove Apro	n Both 🛛 📉	~ R	emove Head	wall To Fac	e Parapet		
PROPOSED S	TRUCTURE		4				
Station:		Be	dding Class:				\sim
Offset:		Pr	oposed Cam	ber DR102:	:		
Kind:		 D€ 	esign Cover:				
Size:		~ Pij	pe Class:				\sim
Design No:		Le	ngth New Co	onstruction			
Design Q:		Pr	oposed Apro	on In:			

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	cture					Present Stru	cture				
Design No.		Drainage Area	19.15 v acres	TerrainType	e: Rollir	Design No.		Drainage Area	19.15 ~ acres	TerrainTyp	be: Rol
Survey Station	414+91.9	0 Description	54"x289'			Survey Station	414+91.90	Description	54"x289'		
Remove Apron	Both	Remove Headw	all To Face Parapet		\sim	Remove Apron	Both 🗸	Remove Headw	all To Face Parapet		\sim
PROPOSED ST	RUCTURE	_				PROPOSED ST	FRUCTURE				
Charles .	44.430.00	Bedding Class:				Station:	414+29.00	Bedding Class:		~	
Station:	41429.00	Proposed Camb	PR102	-		Offset:		Proposed Cambe	er DR102:		Contr
Offset:			EI DRIUZ.		Control	Kind:	~	Design Cover:			Left/F
Kind:	~	Design Cover:			Left/Rig	Size:	~	Pipe Class;		~	Locat
Size:	~	Pipe Class:		~	Locatio	Design No:		Length New Son	struction:		Top E
Design No:		Length New Con	struction:		Top Ele [.]	Design Q:		Proposed Apron	In:		Type
Design Q:		Proposed Apron	In:		Type	Headwater:		Proposed Apron	Out:		
Headwater:		Proposed Apron	Out:			Standard		Connection Type	:	~	
Standard		Connection Type	2:	\sim		DR		Flume Descriptio	in:		
DR	~	Flume Descriptio	on:			A	~	Grade:			
A		Grade:				B		Flowline Left:			Apron
в		Flowline Left:			Apron G	0		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.

Present S	tructure				
Design No.			Drainage Area	19.15 $\scriptstyle{\vee}$ acres	TerrainTyp
Survey Statio	on	414+91.90	Description	54"x289'	
Remove Apr	on Both	\sim	Remove Headw	all To Face Parapet	
PROPOSED	STRUCT	URE			
Station:	/	414+29.00	Bedding Class:		\sim
Offset:			Proposed Cambe	er DR102:	
Kind:		4	Design Cover:		
Size:	СМР	1	Pipe Class:		\sim
Design No:	EXST	· · · · · · · · · · · · · · · · · · ·	Length New Con	struction:	
Design Q:	HDPE LCP	1	Proposed Apron	In:	
Headwater:	RCB		Aroposed Apron	Out:	
Standard	RCP		Connection Type	2:	\sim
DR	SARC UNCL		Fluine Descriptio	on:	
A	S.LEL		Grade:		
			Flowline Left:		

For this example, select RCP.

Next, select the size.

Present S	tructure				
Design No.			Drainage Area	19.15 \lor acres	Terra
Survey Stati	on	414+91.90	Description	54"x289'	
Remove Apr	on Both	~	Remove Headw	all To Face Parapet	
PROPOSED	STRUCT	URE			
Station:		414+29.00	Bedding Class:		
Offset:			Proposed Cambo	er DR102:	
Kind:	RCP	~	Design Cover:		
Size:		×.	Pipe Class:		
	12	~	Length New Con	struction:	
Design Q:	15		Proposed Apron	In:	
Headwater:	18		roposed Apron		
	21 24		Connection Type		
Standard	24		Flume Descriptio		
DR	30			/II.	
A	36		Grade:		
В	42		Flowline Left:		
С	48		Flowline Right:		
D	54		Flowline other		
-	60 66		Flowline Other		
E	72			-	
Record: I4 - 4 1		Fi	DR205 Inlet Anro Iter Search		
Proposed Size	84	~			

For this example, it will be 54"

Present Str	ucture						
Design No.		Drainage Area 19.3	15 v acres TerrainTy	/pe: Rollin			
Survey Station	414+91.90	Description 54"x289'	Description 54"x289'				
Remove Apror	Both ~	Remove Headwall To Face Parapet					
PROPOSED S	TRUCTURE		<u>R</u>				
Station:	414+29.00	Bedding Class:	NE ~				
Offset:		Proposed Camber DR102:		Control			
Kind: R	CP 🗸	Design Cover:		Left/Rig			
Size:	54 ~	Pipe Class:	~	Locatio			
		Length New Construction:		Top Ele			
Design Q:		Proposed Apron In:		Type			
Headwater:		Proposed Apron Out:					
Standard		Connection Type:	~				
DR	~	Flume Description:					
A		Grade:					
В		Flowline Left:		Apron G			
С		Flowline Right:		Diaphra			
D		Flowline Other		Tee Sect			
F		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.

Drainage Area (Acres, 1 to 1280) 19.15	Com	pute Q's	Prir	nt
Land Use and Slope © Select	Chart (Q (ft^3/s) 7()	
Land Use Mixed Cover		Return Period (Years)	Frequency Factor (FF)	Q (ft^3/s)
Slope Rolling O.6	•	5	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.

Present St	ructure					
Design No.			Drainage Area	$19.15 \lor$ acres	TerrainType:	Rolling
Survey Statio	'n	414+91.90	Description	54"x289'		
Remove Apro	on Both	\sim	Remove Headw	vall To Face Parapet		\sim
PROPOSED	STRUCT	JRE				
Station:		414+29.00	Bedding Class:		\sim	
Offset:			Proposed Camb	er DR102:		Control
Kind:	RCP	\sim	Design Cover:			Left/Righ
Size:		54 ~	Pipe Class:		\sim	Location
			Length New Cor	struction:		Top Eleva
Design Q:	42		Proposed Apron	i In:		Гуре
Headwater:			Proposed Apron	Out:		
Standard			Connection Type	e:	\sim	
DR		\sim	Flume Description	on:		
A			Grade:			
В			Flowline Left:		ŀ	Apron Gu
С			Flowline Right:		[Diaphrag
D			Flowline Other		٦	Tee 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>





Depending on the DR Standard that is selected the appropriate information fields will become active. For example, assume the standard used is <u>DR-641</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:

÷.

วนเพยุ วเลเต	911 414+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:	V 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	ion 414+91.90		Description	tion 54"x289'			
Remove Apr	on Both	\sim	Remove Headw	all To Face	Parapet		\sim
PROPOSED	STRUCTURE						
Station:	414+29.00		Bedding Class:	C			
Offset:			Proposed Camber DR102:			(Control
Kind:	RCP	\sim	Design Cover:	2.42			_eft/Right
Size:	5	4 ~	Pipe Class:		~ I		ocation Statio
Design No:			Length New Con	struction:			op Elevation
Design Q:	42		Proposed Apron	ln:			Гуре
Headwater:			Proposed Apron	Out:			\mathbf{X}
Standard			Connection Type	:		\sim	N
DR	DR-601	\sim	Flume Descriptio	n:			

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.

Present S	tructure						
Design No.			Drainage Area	19.15	5 - acres	TerrainType:	Rolling
Survey Stati	on	414+91.90	Description	54"x289'			
Remove Apr	on Both	\sim	Remove Headw	all To Face P	Parapet		\checkmark
PROPOSED	STRUCT	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:			<u> </u>	Location Statio
Design No:			Length New Con	struction.	2000		Top Elevation
Design Q:	42		Proposed Apron	In:	3000 4000	\mathbf{N}	Туре
Headwater:			Proposed Apron	0	4500		
Standard			Connection Type	e:	Unclassified		\
DR	DR-601	~	Flume Description	on:			\
A			Grade:				
В			Flowline Left:				Apron Guard (DR21
С			Flowline Right:			[Diaphragm (DR501)
D			Flowline Other			-	Tee Section (DR142
							. .

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			
Station:	414+29.00	Bedding Class:	C	·
Offset:		Proposed Camber DR102:		Control
Kind:	RCP ~	Design Cover:	2.4	2 Left/Right
Size:	54 ~	Pipe Class:	2000	Location Statio
Design No:		Length New Construction:	29	0 Top Elevation
Design Q:	42	Proposed Apron In:		1 🔪 Туре
Headwater:		Proposed Apron Out:		1
Standard		Connection Type:		
DR	DR-601 ~	Flume Description:		\setminus
А		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.

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

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

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.

PROPOSED	STRUCTURE			
Station:	414+29.00	Bedding Class:	C ~	
Offset:		Proposed Camber DR102:		Control
Kind:	RCP v	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:		
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		Netharks.

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 ~	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
0			Flowline Right:	969.95			Diaphragm (DR50:
С			Flowline Other				Tee Section (DR14
Ξ			Flowline Other				Reducer
:			DR205 Inlet Apron Top				Demonster
31			Total Length Left	145.00		_	Remarks:
32			Total Length Right	145.00	-	_	
_			Trenchless Total		I	0	
N			Extension Left				
٦			Extension Right				
			CI AL				

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	~	Location Station
Design No:			Length New Construction:290		0 Top Elevation	
Design Q:	42		Proposed Apron In:			1 Type
Headwater:			Proposed Apron Out:			1
Standard			Connection Type:		~	·
DR	DR-601	\sim	Flume Description:			
4			Grade:	972.50		
3			Flowline Left:	971.69		Apron Guard (DR2
0			Flowline Right:	969.95		Diaphragm (DR50:
С			Flowline Other			Tee Section (DR14
=			Flowline Other			Reducer
=			DR205 Inlet Apron Top			Remarks:
G1			Total Length Left	145.00		Remarks:
G2			Total Length Right	145.00		
_			Trenchless Total	I		0
VI			Extension Left			
٦			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.

บะรายา ป.	42	· · • • • • • • • • • • • • • • • • • •	-	iyhe
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	Refildiks.
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	0.00	Bedding Class:	C ~	
Offset:			Proposed Camber DR102:		Contr
(ind:	RCP	\sim	Design Cover:	2.42	Left/F
Size:	54	1 ~	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:	~	
DR	DR-601	\sim	Flume Description:		
4			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		
51			Total Length Left	145.00	Remar
52			Total Length Right	145.00	
-			Trenchless Total	0	
VI			Extension Left		
3			Extension Right		
<			Skew Ahead Left		
Elbow 1			Skew Ahead Right		_
Elbow 2					
Standard 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	+
1 :	290	Top Elevation	
	1	Туре	
	1		
	\sim		

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
1			
~			
072.50			/
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-501</u>. Enter the number that is needed for that structure.

1	Туре		Nur
972.50			
971.69	Apron Guard (D	R213)	
969.95	Diaphragm (DR	501)	 _
	Tee Section (DR	142)	
	Reducer		
	Remarks:		
145.00	Netharks:		
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	Туре			Nur
972.50				
971.69	Apron Guard (D	R213)		
969.95	Diaphragm (DR	501)		
	Tee Section (DR	142)	+	
	Reducer			
	Remarks:			
145.00	Nemarks.			
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 (DI	R213)		
969.95	Diaphragm (DR5	01)		
	Tee Section (DR	142)		
	Reducer		-	
145.00	Remarks:			
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.

PROPOSED STRUCTURE

Station:	414+29.00	Bedding Class:	C v		DIKE	
Offset:	414+29.00	Proposed Camber DR102:		Control	DIKE	
Kind:	RCP	Design Cover:	2.42	Left/Right		
		Pipe Class:				
Size:	54 ~	1		Location Statio		Roadway
Design No:		Length New Construction:	290	Top Elevation		Number
Design Q:	42	Proposed Apron In:	1	Туре		Number
Headwater:		Proposed Apron Out:	1			
Standard		Connection Type:	\checkmark			
DR	DR-601 ~	Flume Description:				
А		Grade:	972.50			
В		Flowline Left:	971.69	Apron Guard (D	DR213)	
С		Flowline Right:	969.95	Diaphragm (DR	501)	
D		Flowline Other		Tee Section (DR	3142)	
E		Flowline Other		Reducer		
F		DR205 Inlet Apron Top				
G1		Total Length Left	145.00	Remarks:	Remove or plug and abandon ex RCP at Sta. 141+91.90 Replace w	0
G2		Total Length Right	145.00		RCP at Sta. 141+29.00 with inlet	
L		Trenchless Total	0		aprons. 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.

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	Apror	n Guard (DF	R213)							
95	Diaph	ragm (DR5	01)							
	Tee S	ection (DR1	142)							
	Reduc	cer								
00	Remai	l	Remove or RCP at Sta. RCP at Sta. aprons. Cu	141+91.9 141+29.0	90 Repla 00 with	ace with 2	90' 54"			
► La	st	≂ Delete	Current		Mai	n Menu		Sche	dule Sheet	

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

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0.000				FILE NO				ROAD	He	olst\Ack	erman			В		Z	Т		CLEAR			TO ROAD	DESIGN				NO. PI	PES	
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LOCATION	0.3 mi	E of Bus 34 In	terchanze to 0.4 n	n	то			TRAFFI	C COUN	т		VPD Y	(R	SEE	ROAD DE	GN TYPICAL	NO.		Date										
			•																										
DESIGN	4 1	PRESENT	STRUCTURE									PR	OPOSED STRU	ICTURE									-		DIKE		-		
				LOCA	TION	-						ADAPTERS			EU	VATION	_		DIMENSIO			N AHEAD		I					
											APRON	DR-122	4				DR-2		_	EXTENSIC	NS (D	EGREES)	-						
									LGTH	DESIGN							INLE APRO		TRENC				1						
	DRAINAGE	SURVEY							NEW	COVER			FLUME				TOP		LESS					I	LOCATION		TOP	DISPOSITION OF	
NUMBER	AREA	STATION	DESCRIPTION	STATION	OFFSET	DR	SIZE	KIND	CONST			TYPE NO.	DESCRIPTION			IT OTHER OT	HER ELE			LEFT RI	SHT LEF	RIGHT	CNTR	LT/RT	STATION	ELEVATIO	ELE	PRESENT	
		414+91.90	54"x289'	414+29.00		DR-601	54	RCP	290	2.42	1 1			972.50 9	71.69 969.	15		145.00 14	5.00 0									Poor	Remove
	19.15- Bolling	axa+s1.90																											at Sta. 3

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.

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PROJECT N	O NHSN-I	034-8(159)2	R-51	PIN NO	21-51	-034-01	D			laman\l					BW		Е		х				то	FINAL	DESIGN				DESIG	NS	
LOCATION	0.3 mi	E of Bus 34 In	terchange to 0.4 n	n	то			TRAFF	IC COUP	(T		V	PD YR		SEE F	IOAD DES	IGN TYPI	CAL NO.		D	ate										
DESIGN		PRESENT	STRUCTURE										PROPO	SED STRUG	TURE												DIKE				
	DRAINAGE	SURVEY		LOC					NEW	DESIGN	Π	ADAP DR-1	122 F	LUME			VATION		DR-205 INLET APRON TOP	TOTAL	TRENCH	NSIONS	SKEW /	EES)			LOCATION		тор	DISPOSITION OF	
NUMBER	AREA	STATION	DESCRIPTION	STATION	OFFSET	DR	SIZE	KIND	CONST				NO. DES	CRIPTION		FT RIGH		OTHER		LEFT RIGHT	TOTAL LEF	RIGHT	LEFT	RIGHT	CNTR	LT/RT	STATION	ELEVATIO	ELE	PRESENT	
	19.15- Rolling	414+91.90	54"x289'	414+29.00		DR-603	54	RCP	290	2.42	1 1			9	72.50 97	1.69 969.1	5			145.00 145.00	0	-								Poor	Remove or plug at Sta. 141+91. at Sta. 141+29. aprons. Cut and
	11.5-Hilly	228+15.65	54"x432'							Ϋ́											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.



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 this message to indicate when it is done. Click the OK button to dismiss.

Microsoft Access	×
Your file was saved at C:\WORK\NHSN-034-8(159)2R-51ScheduleSheet.pdf	
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Next, exit the database. Click on the Main Menu button at the top of the Schedule Sheet.

Home	e Cre	ate Ex	ternal Data	Database	Tools	Help	۶	Tell me what	you want to do										
													Create Pl	DF	Data Entry	Form	N	lain Menu	
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PROJECT N		034-8(159)	10.51	PIN NO	21.51.	034-010		ROAD Holst DRAINAGE Clama	Ackerman	B	Z	T	CLEAR	TO ROAD TO FINAL			NO. PI DESIG		
LOCATION			nterchanze to 0.4 r		то	004-010		TRAFFIC COUNT	VPD YR		AD DESIGN TYPICAL	NO	Date					~	
	0.5111		•		10						io desion minore	1101	0010						
DESIGN		PRESEN	T STRUCTURE	LOCA	TON					ED STRUCTURE	ELEVATION		DIMENSIONS (E)			DIKE			
NUMBER	DRAINAGE AREA	SURVEY STATION	DESCRIPTION	STATION	OFFSET	DR	SIZE	LGTH DESI NEW CON KIND CONST (I-	/ER FI	UME RIPTION GRADE LEFT		INLET APRON TOP	TOTAL EXTENSI	SKEW AHEAD ONS (DEGREES)	CNTR LT/RT	LOCATION STATION ELI	TOP TOP EVATIO ELE	DISPDSITION O	JF
	19.15- Rolling	414+91.90	54"x289'	414+29.00		DR-601	54	RCP 290 2.4	12 1 1	972.50 971.65	9 969.95	145.	00 145.00 0					Poor	Remo at Sta at Sta
	11 Sallbr	228+15.65	54"x432'					т					0					Fair	apro

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

е	Home	Create	External Data	Database Tools	Help	2	Tell me what you want to do
			Main	Menu			
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			<u>= Survey</u>	<u>Records</u>			
			Create Nev	v Project File		N	
			Export	to 104-3		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 project wise.