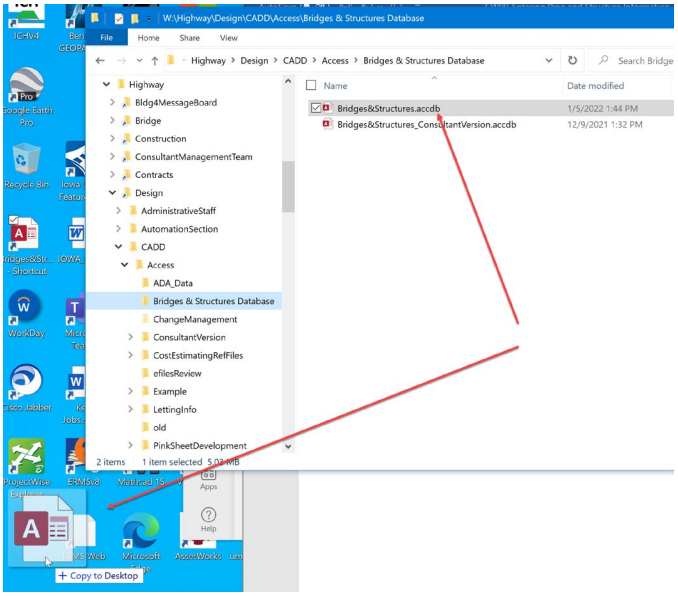
Entering Pipe and Structure Information into Database

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

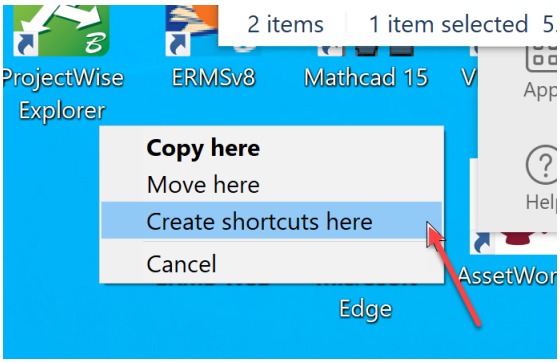
There are two ways this can be done. The first way is intended for internal Iowa DOT employees and the other way is for outside employees or consultant projects.

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\Bridges & Structures Database. Select the Bridges&Structures.accdb and right click and drag to the desktop.



Then select Create shortcuts here.



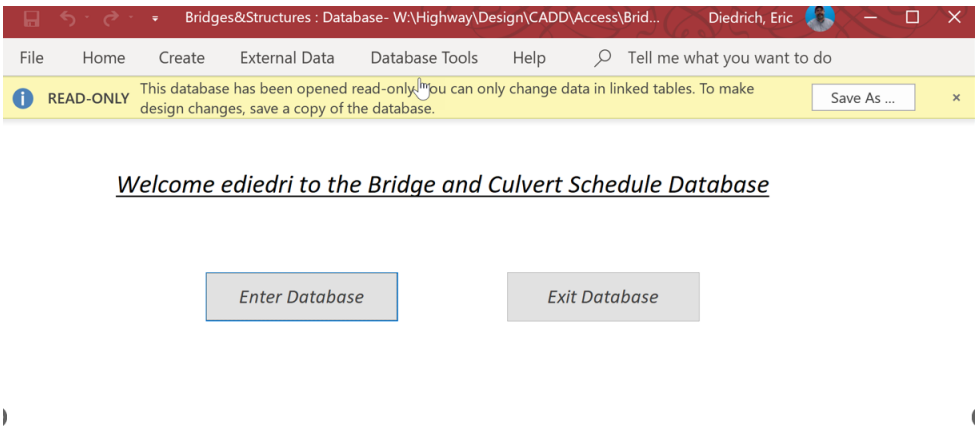
Note: By making a short cut, the system administrators can make changes to the database, and it will always open the latest version.

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\IowaDOTProduction\Organization-Civil\IowaDOT_Standards\Seed\Access\Bridges&Structures_ConsultantVersion.accdb.

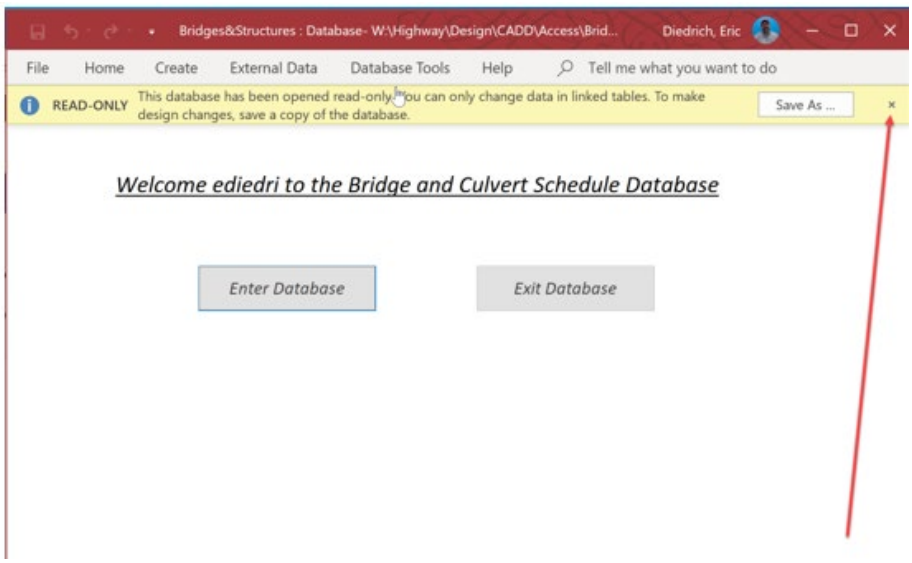
This file should be copied to a local work directory then renamed to Bridges&Structures_CCRRRPPP.accdb. This is because Access does not work properly in ProjectWise.

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

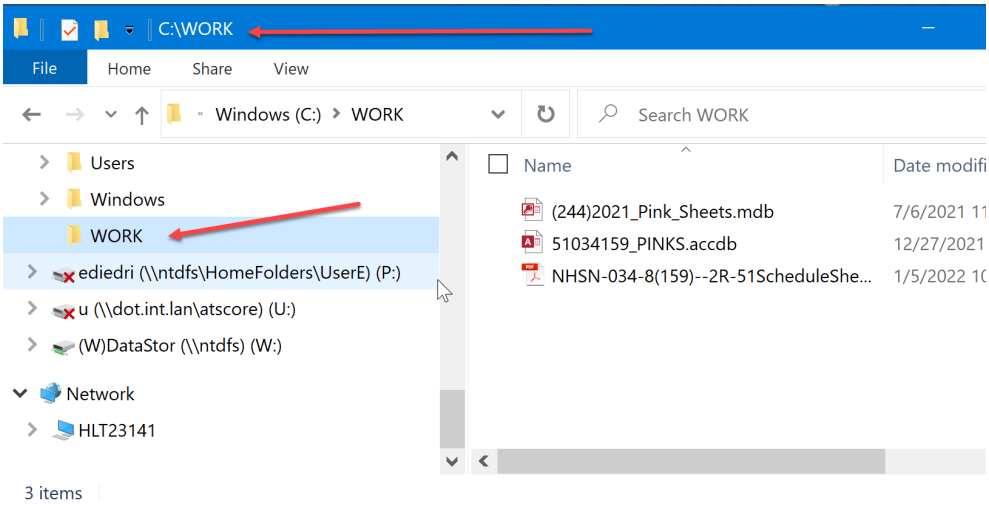
Now that the correct database for both internal and external users has been explained, open it and get started with data entry. The welcome screen appears as shown below.



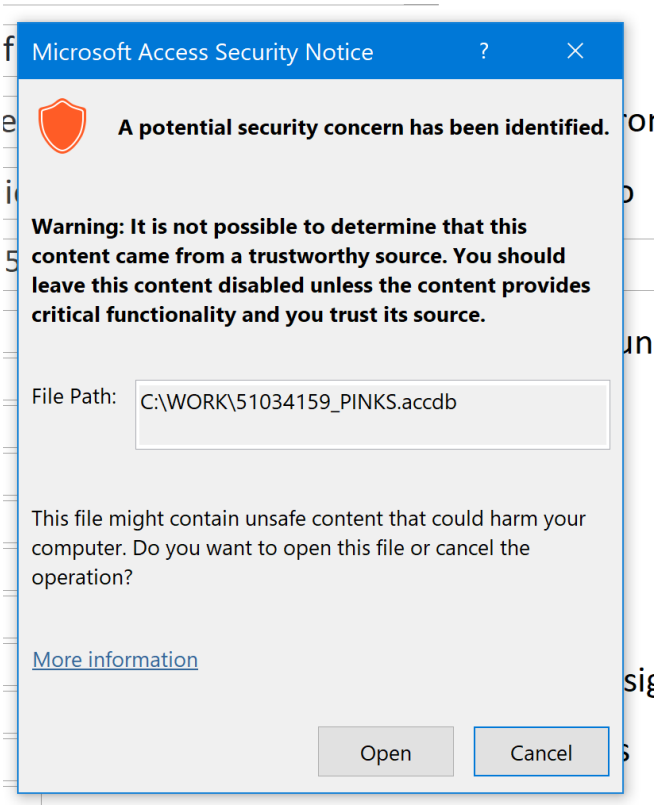
It will display a warning that it is READ-ONLY. Don't be concerned, this is normal. This is indicating that the database design can't be changed. However, the data entry will be stored in a table that is read by this database. Click on the X to close the warning.



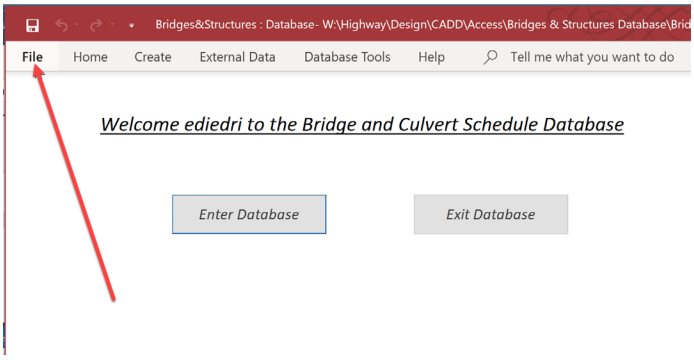
The next step is to make a working directory on the local C:\ drive. For this example, a folder named WORK was created.



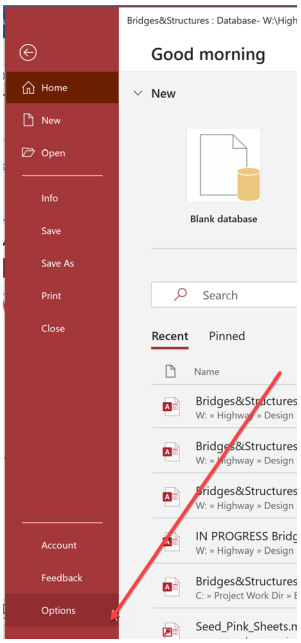
Next, change a few security settings in Access to avoid seeing the warning shown below when the survey information is imported.

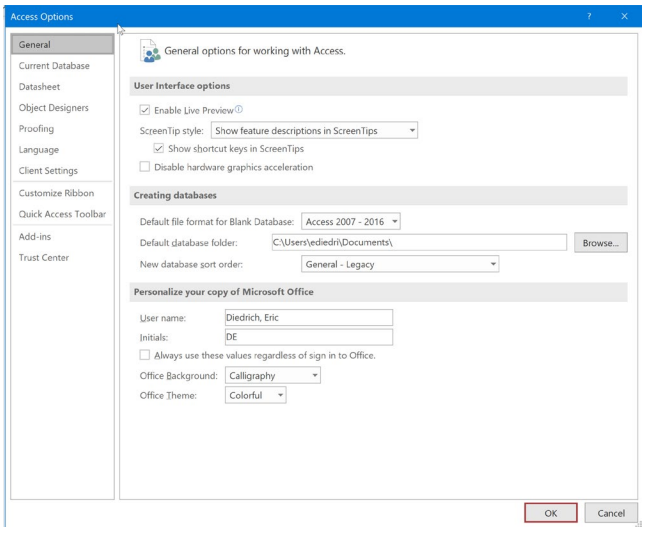


Click on the File menu at the top of the database.

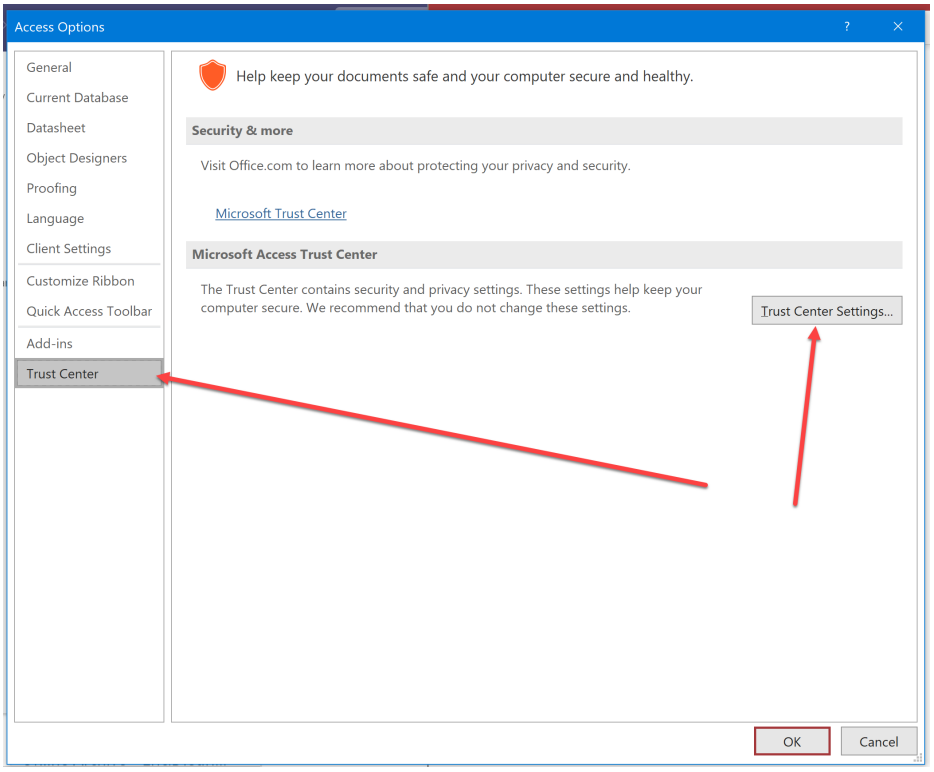


This will open the backstage to access Options. Click on Options to open the Access Options dialog box.

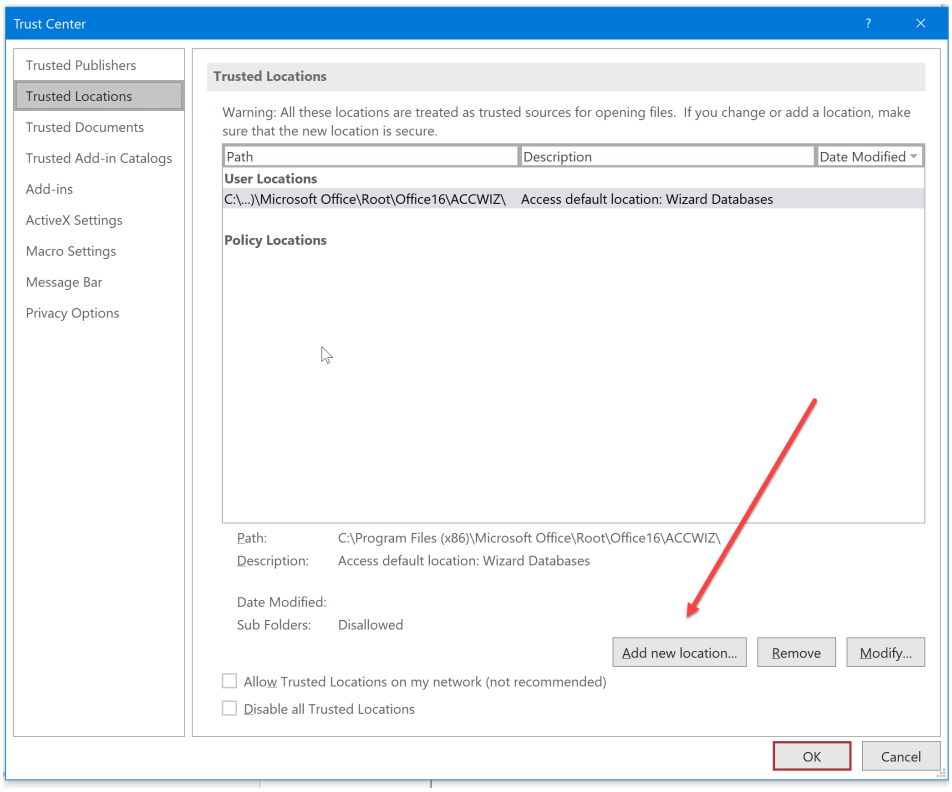




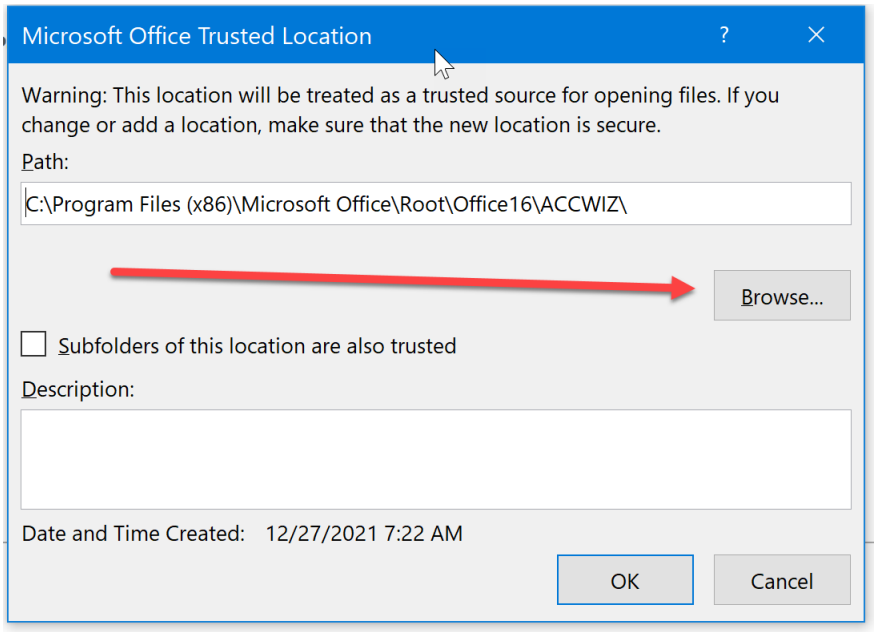
Next, click on the Trust Center option and then click on the Trust Center Settings button.



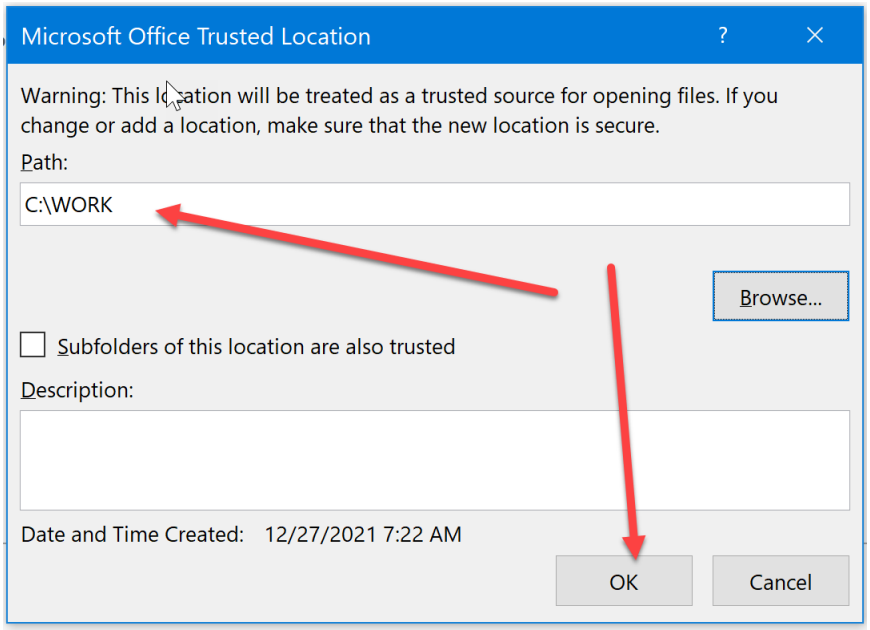
That will open the Trust Center dialog box. Click on the Add new location button.



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.



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

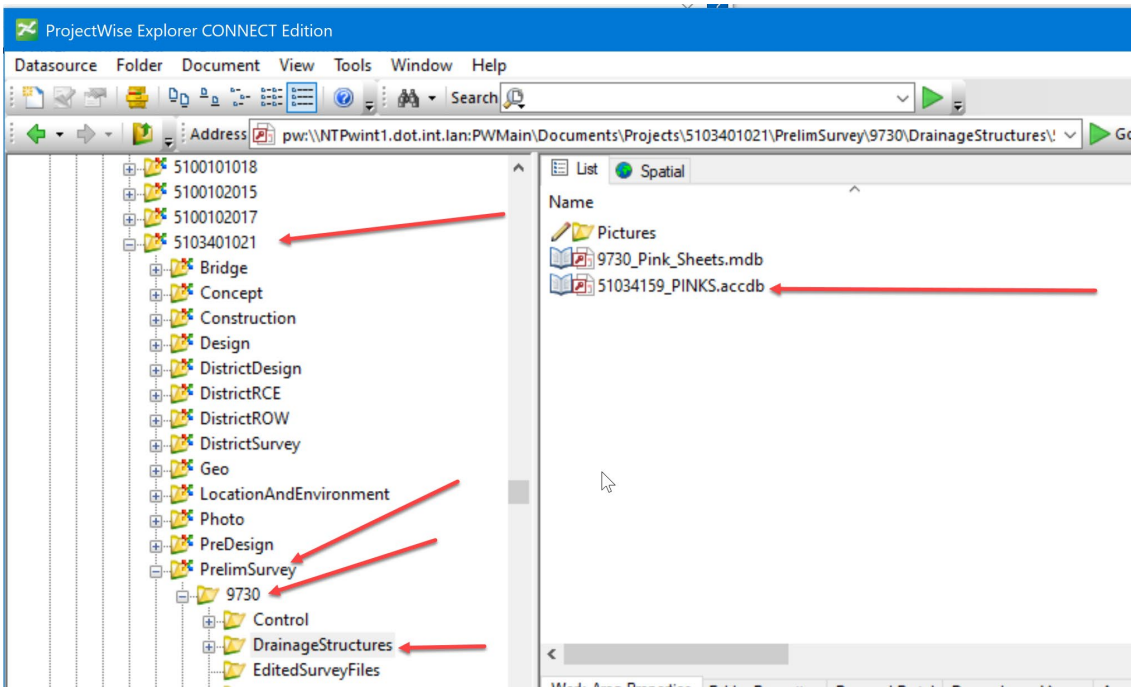


Then click OK.

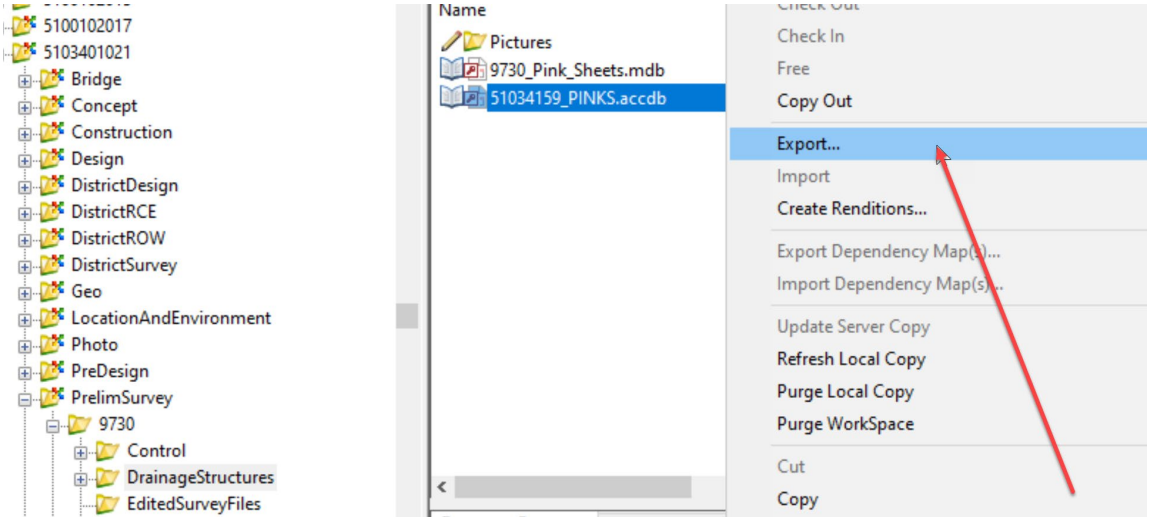
Note: if the same working directory is available and used for all projects, this will only need set once.

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

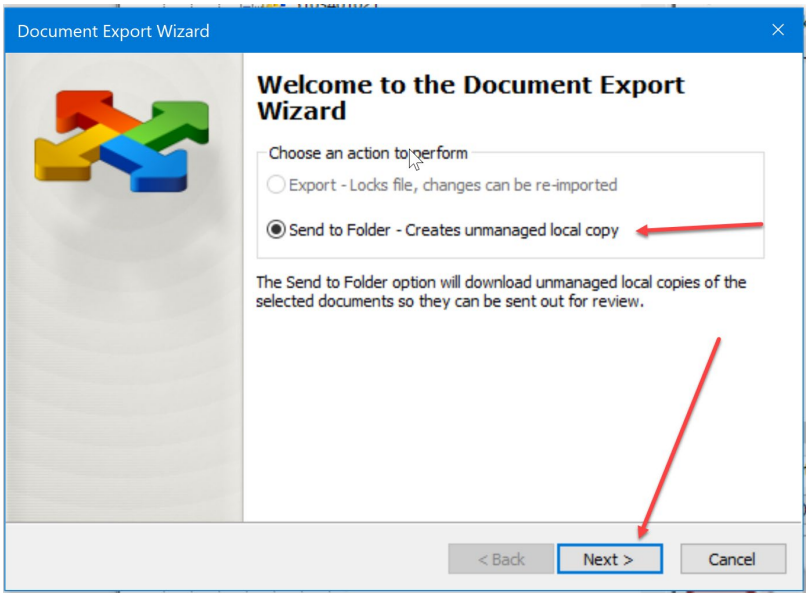
For example: PWMain\Documents\Projects\5103401021\PrelimSurvey\9730\DrainageStructures\
The file will be named CCRRRPPP_PINKS.accdb or for this example it will be 51034159_PINKS.accdb



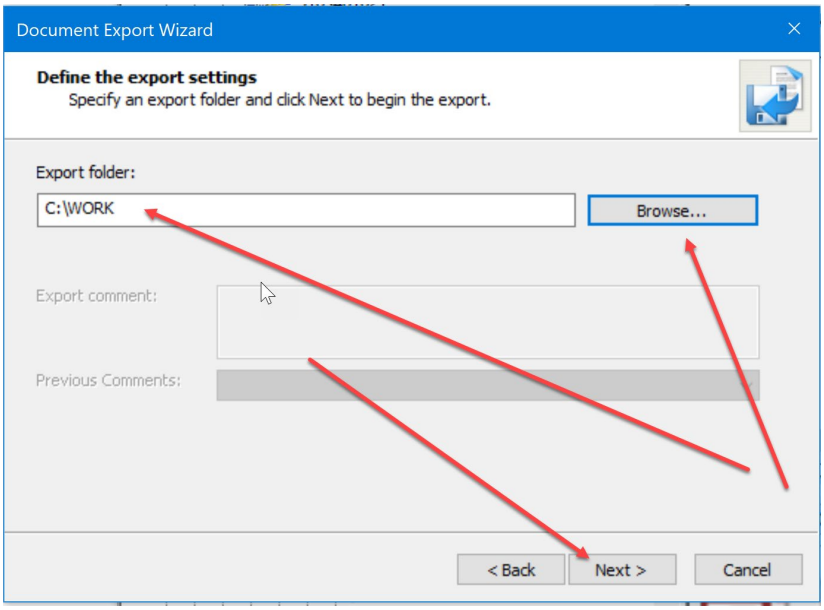
Once the Survey Records are located, export to a local work directory. Select the file, right click and select the Export option.



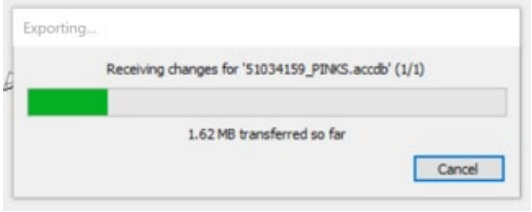
When the Document Export Wizard opens, select the Send to Folder with unmanaged local copy option. Then click the Next button.



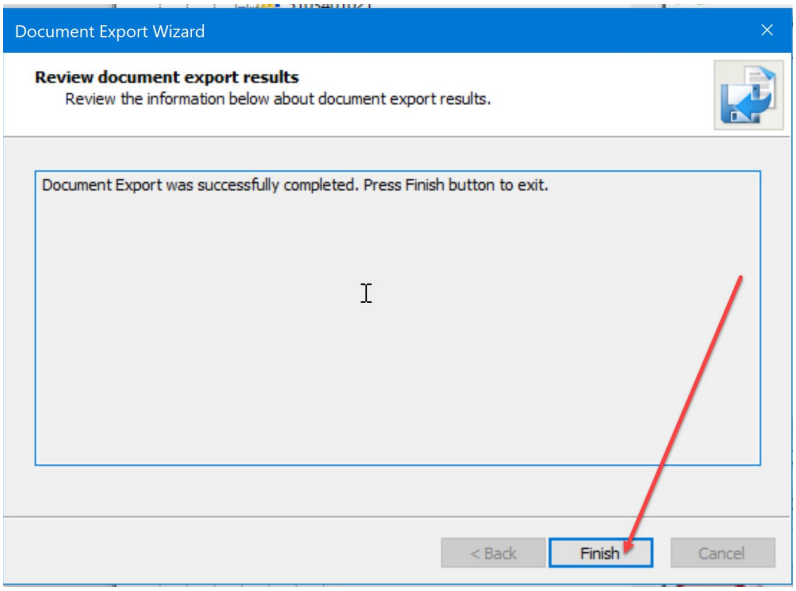
Browse to the local WORK folder created earlier. Then click the Next button.



A progress bar for exporting will display.

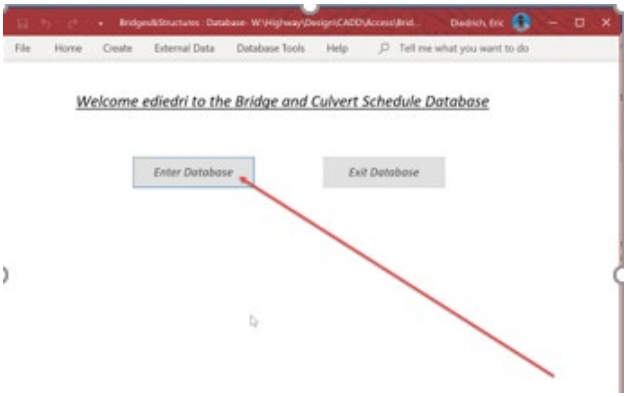


When it is finished, it will display a message indicating a successful export. Click on the Finish button.

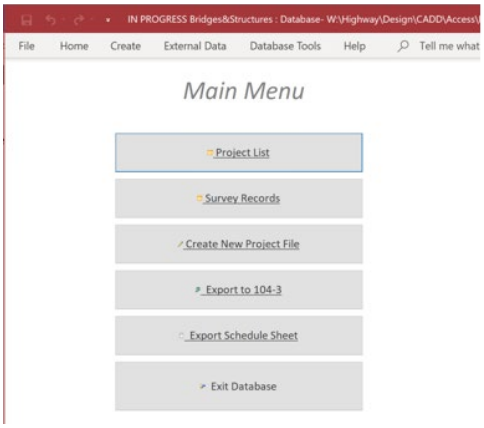


Now return to the Bridges&Structures.accdb database.

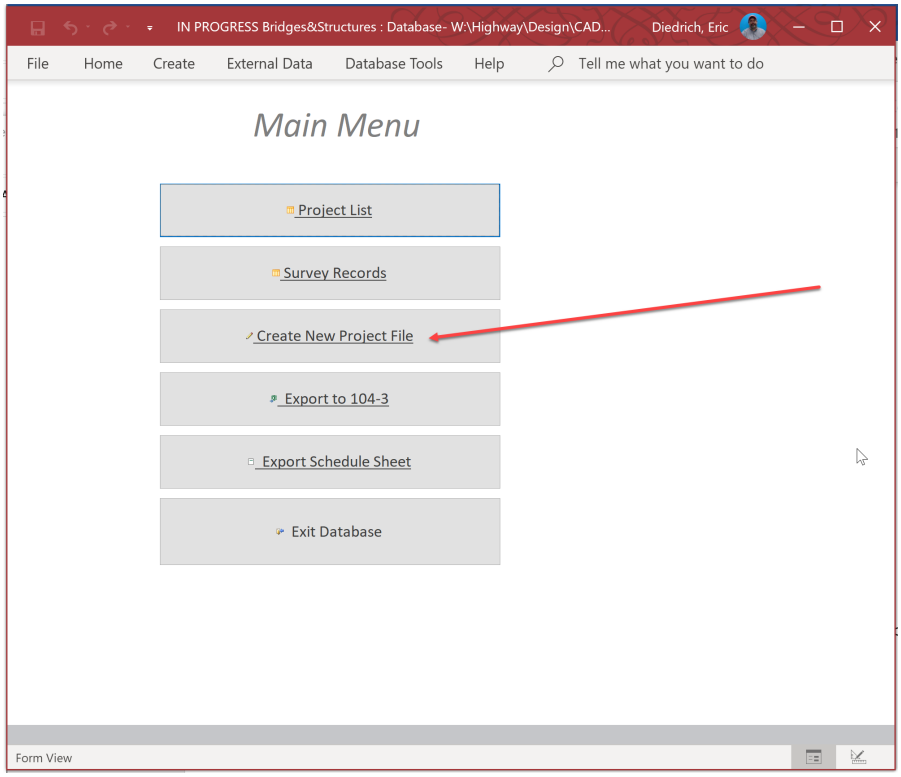
The next step is to Create New Project File. Click on the Enter Database button.



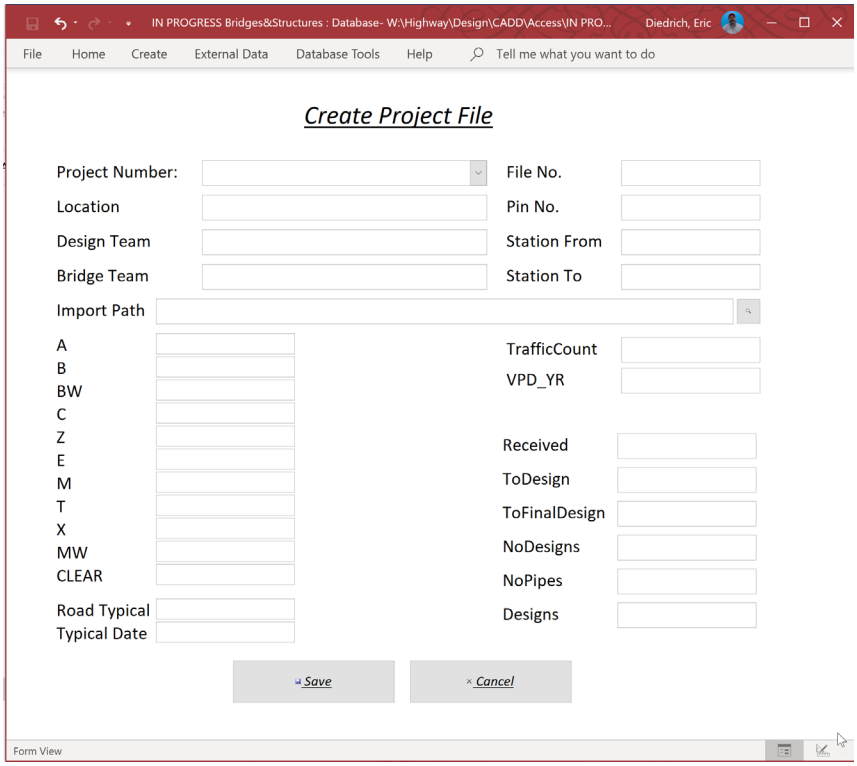
The Main Menu will display.



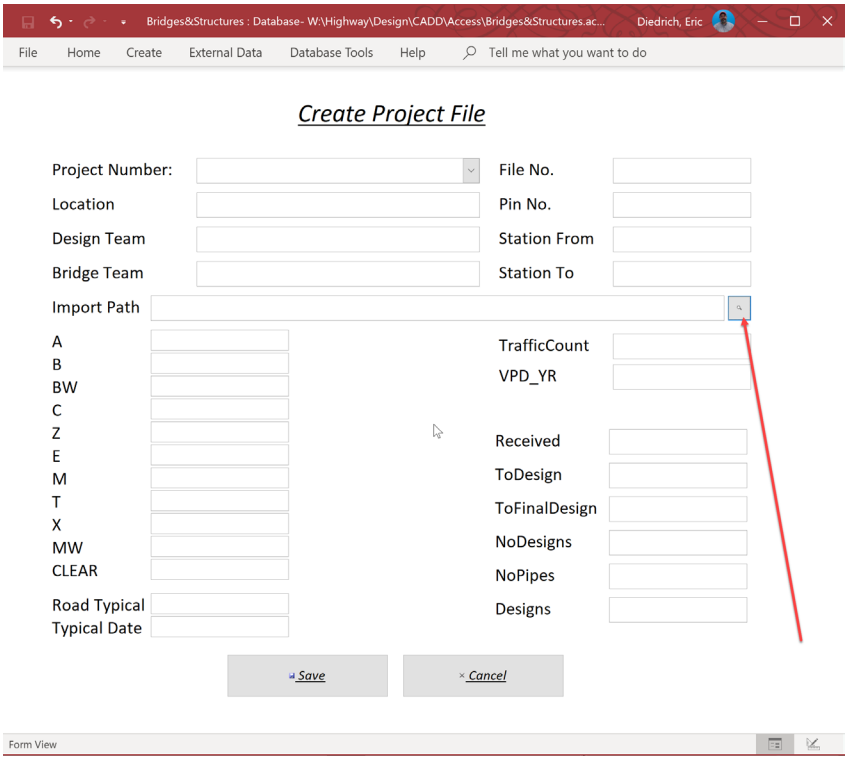
Next, click on the Create New Project File button.



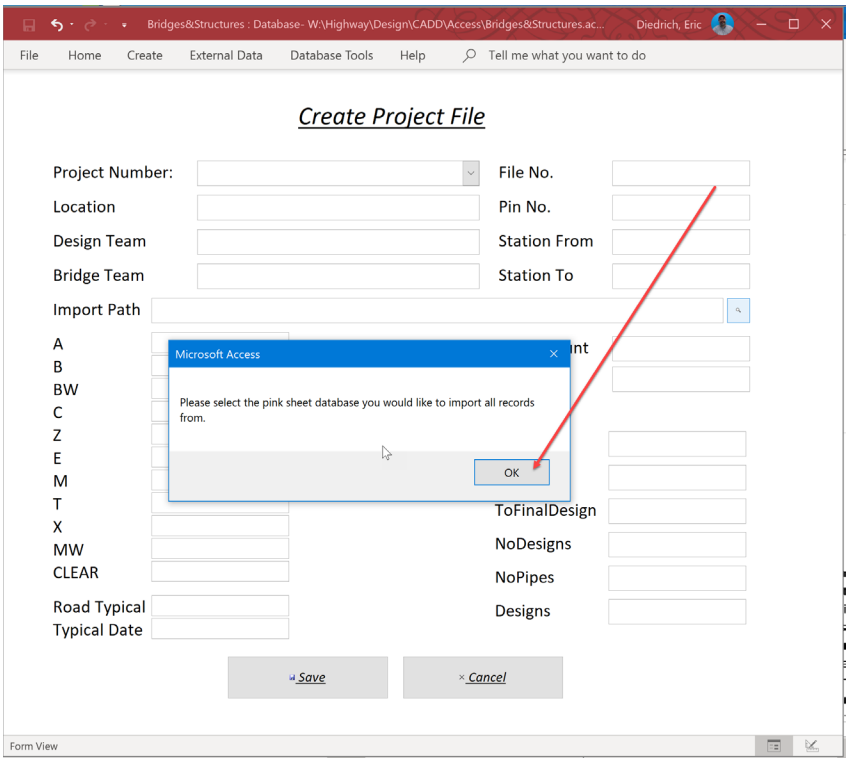
The data entry form will display as shown below.



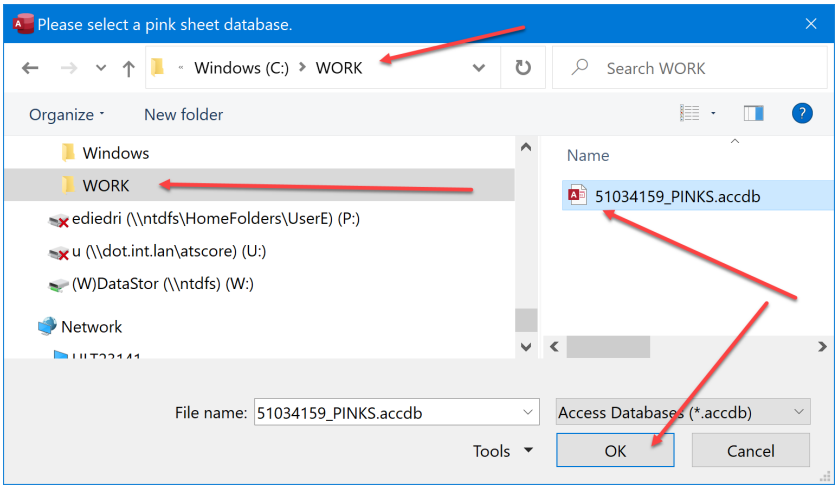
The first step to start a new project is to import the Survey Records into the new project. Click on the magnifying glass next to the Import Path field.



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



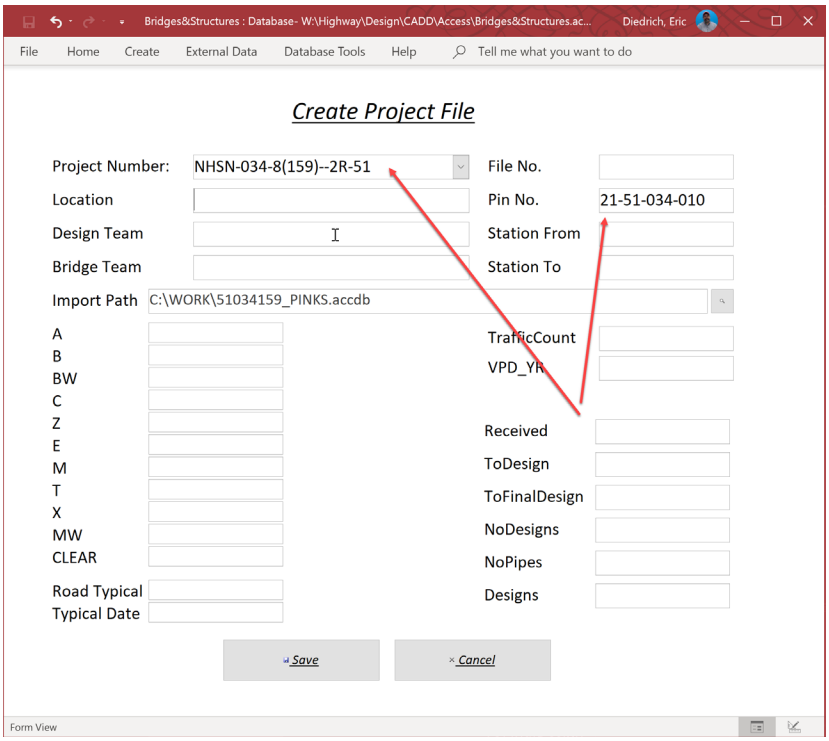
Next, browse to the location that was used to export the Survey Records to and select the CCRRRPPP_PINKS.sccdb file that corresponds with the project. For this example, it will be 51034159_PINKS.accdb in the C:\WORK folder.



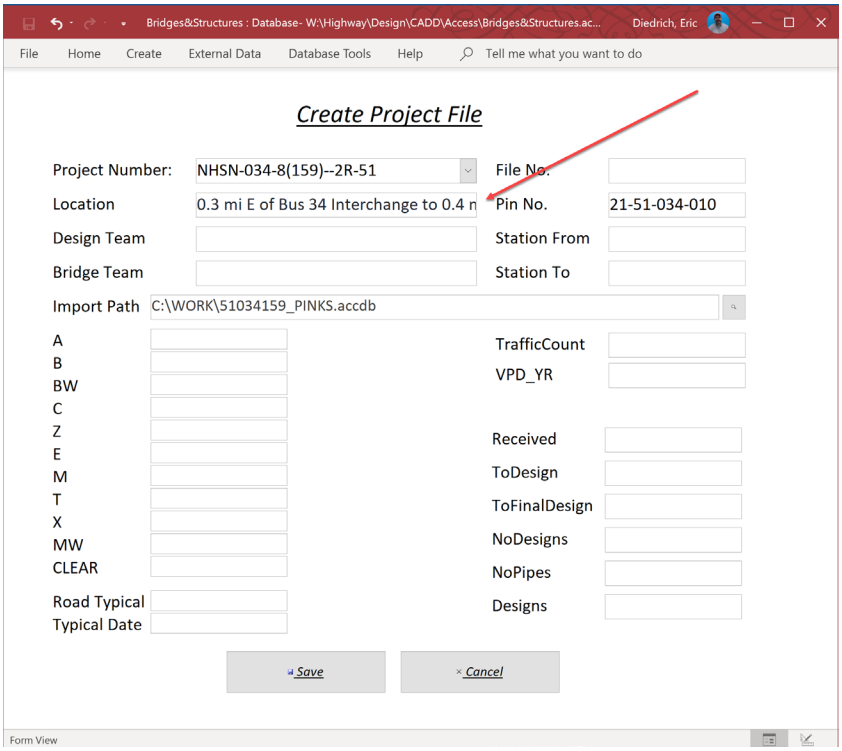
Then click the OK button.

Next, set the project number.

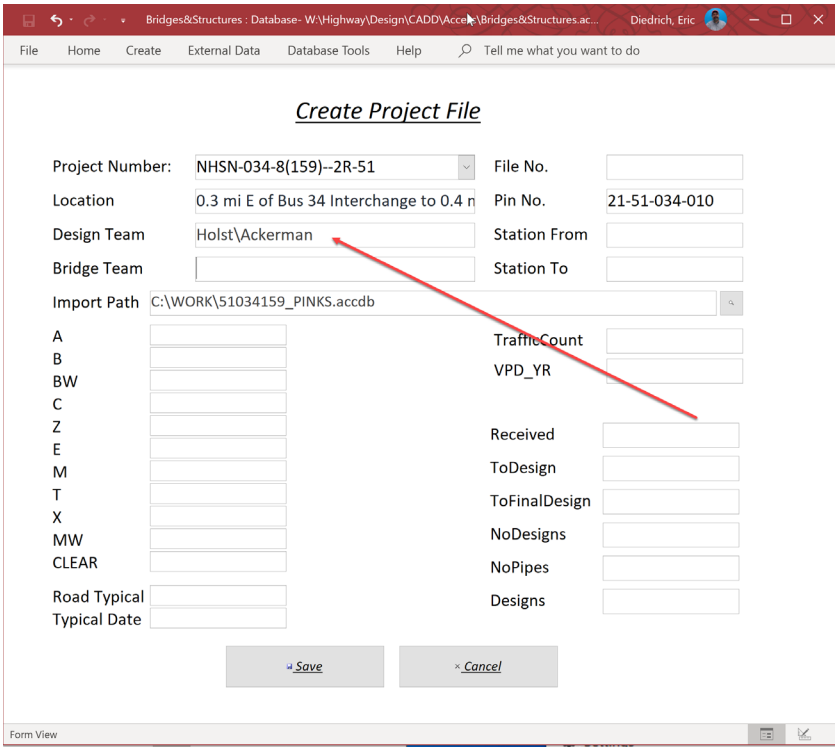
Click on the pulldown in the Project Number field and find the project number from the list and select it. Otherwise, start typing the project number in the Project Number field and the number should autofill as it is typed. Select the correct number. For this example, the project number is NHSN-034-8(159)—2R-51. 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.



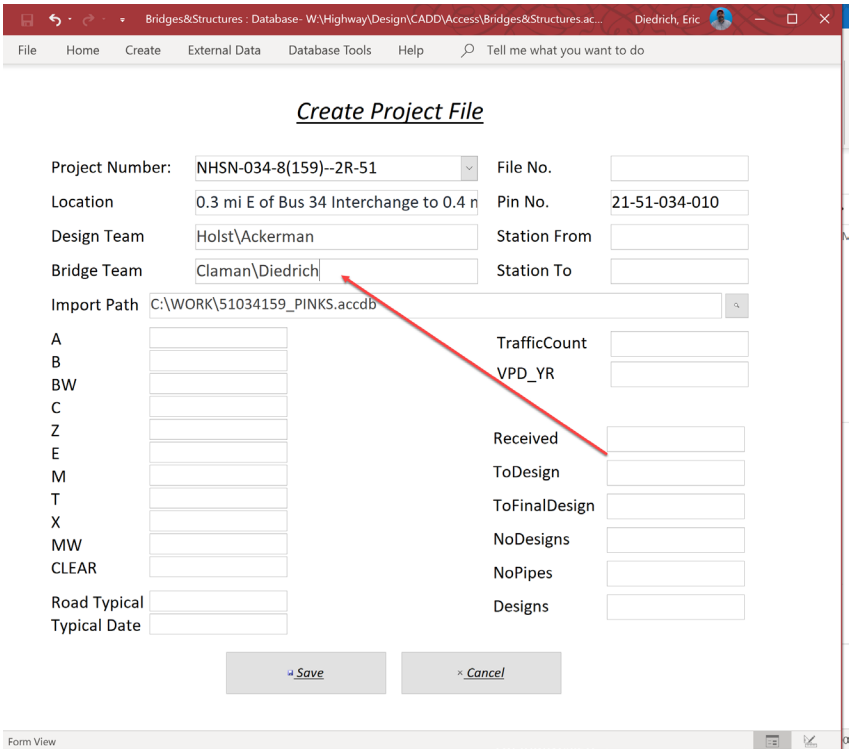
Next, fill out the Location field with the project description. For this example, it will be 0.3 mi E of Bus 34 Interchange to 0.4 mi E of Umber Ave (5 Locations).



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



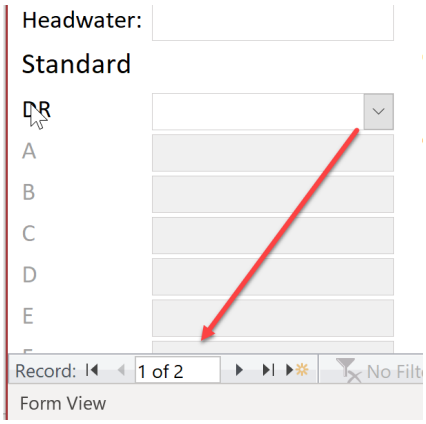
Next, add the Bridge Team. For this example, it will be Claman\Diedrich.



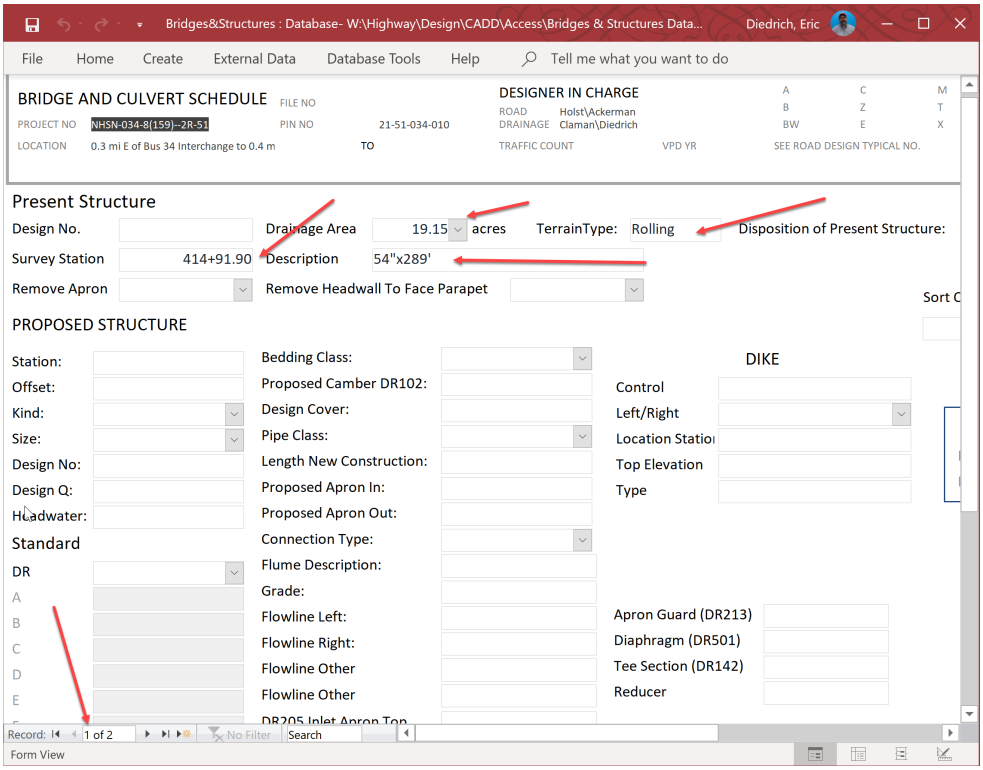
Next, fill out the File No. and Station From and Station To.

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

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

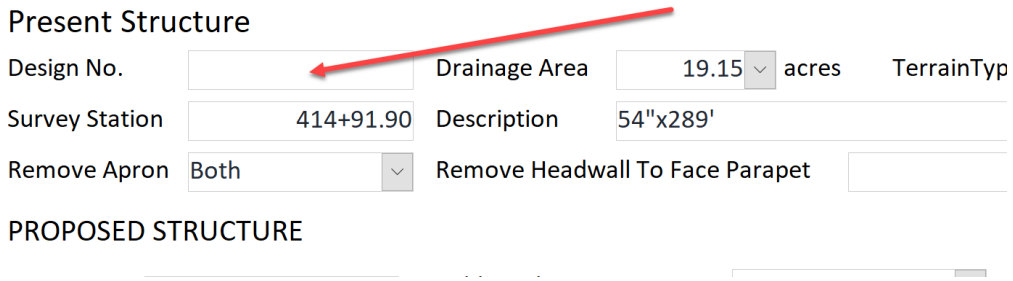


If survey records were not imported, it will show 1 of 1 records. Since the survey records were imported, the Survey Station, the Drainage Area, Terrain Type and Description of the existing structure are shown.



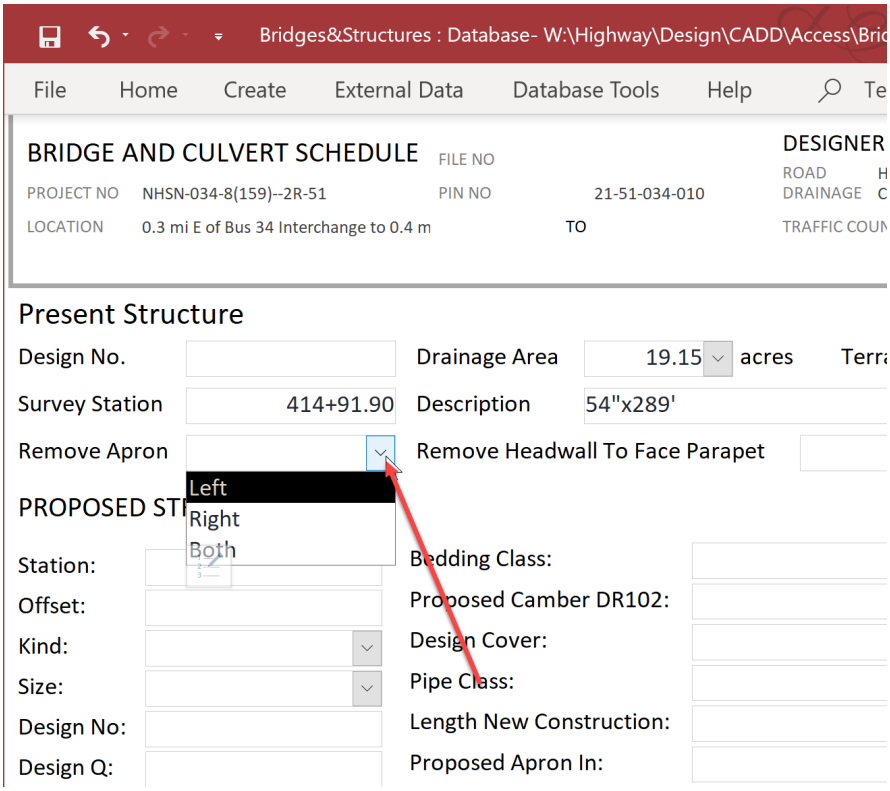
This is the form that will need to be filled out for each structure in the new drainage design. If the existing structure is being replaced with a new one, fill out the proposed structure information on the record of the existing structure that will be replaced. If the existing structure will be left 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.

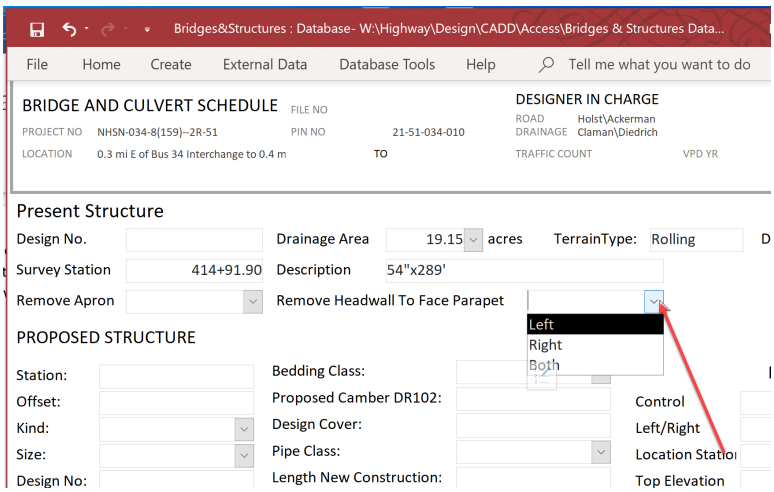


This example is a pipe, so there is not a design number. Leave it blank.

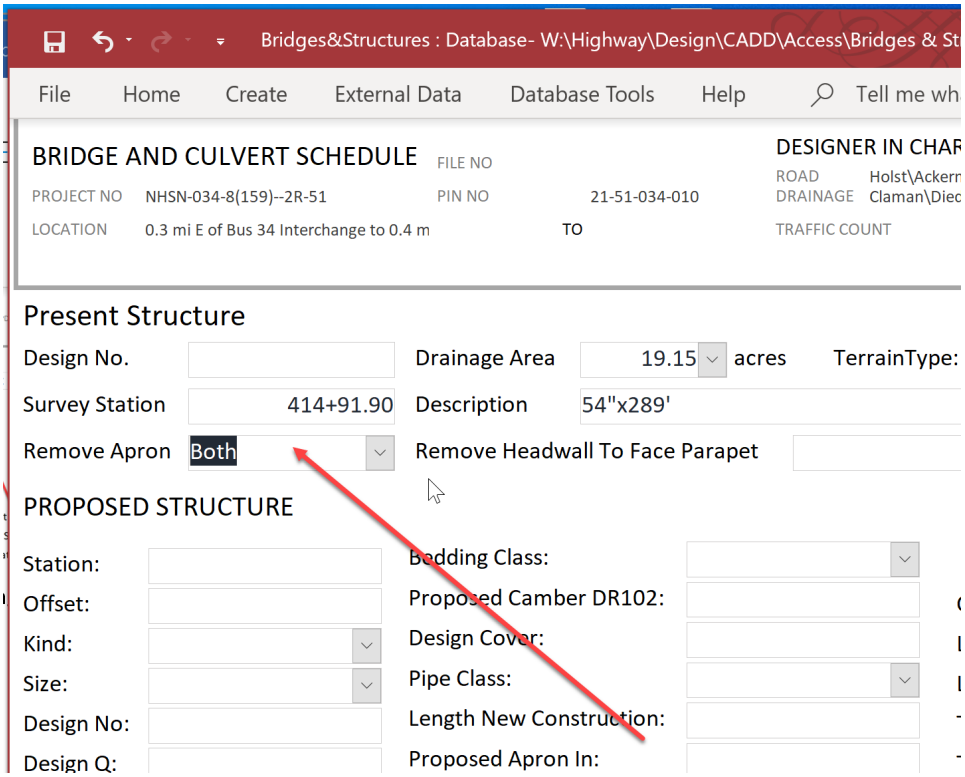
The next thing to do is decide what will be done with the existing structure. If the structure is a pipe, click on the pulldown on the Remove Apron field. This will provide 3 options, Left, Right and Both. If the pipe is being extended, select the end that is being extended. However, if the pipe is being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



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.

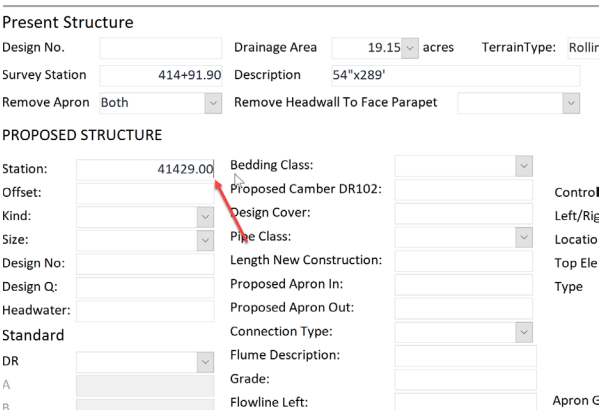


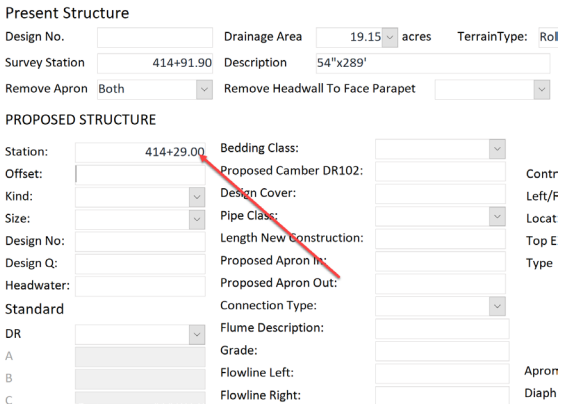
For this example, it is a 54-inch pipe and is being replaced with a new structure so select Both.



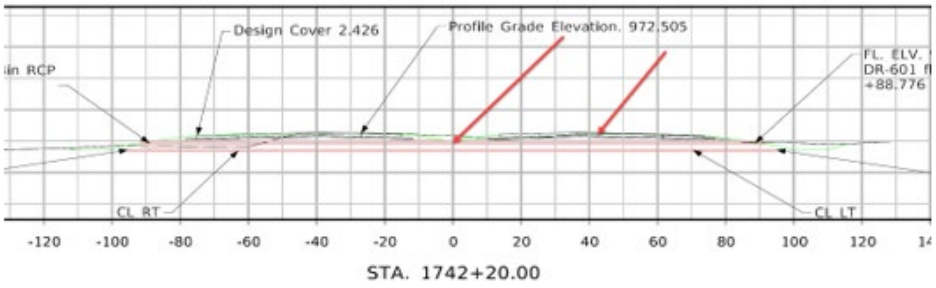
Next, fill out the Station of the Proposed Structure. This is the station value that is the intersection point at the centerline of the Proposed Structure and the centerline of the design alignment. For this example, it will be 414+29.00.

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.



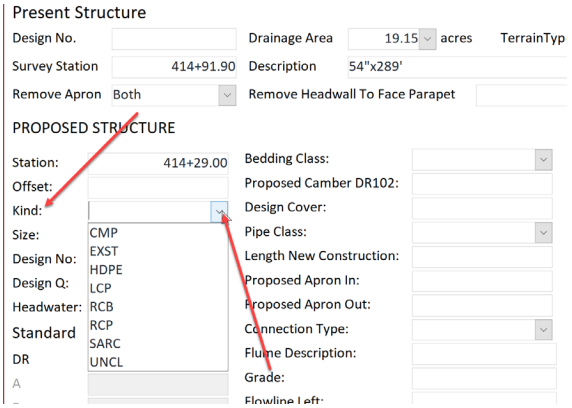


The next field is Offset field. This is used if the structure is on a divided highway. This will be the distance from the mainline centerline to the Base Line as described in the standards.



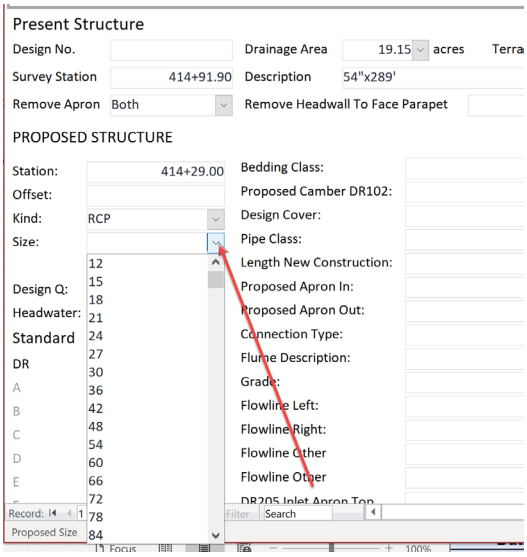
If designing a two-lane highway like in this example, leave this blank.

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

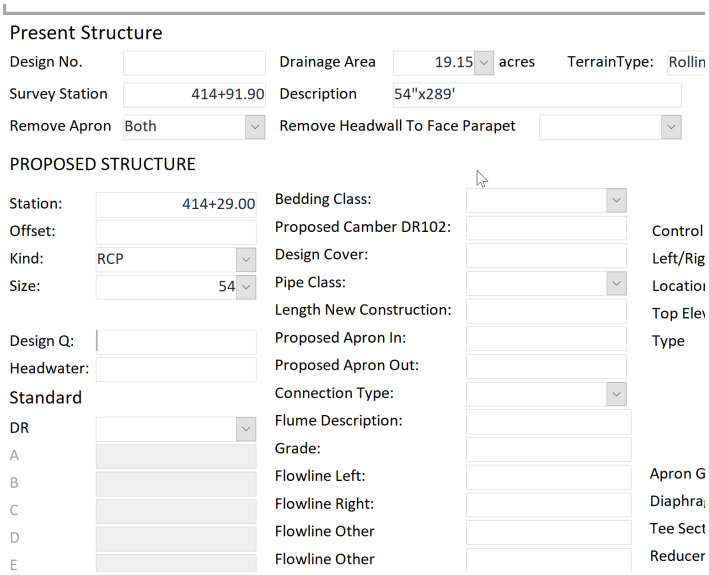


For this example, select RCP.

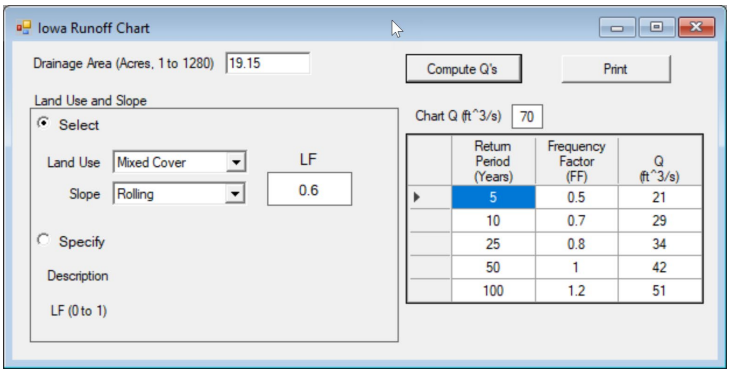
Next, select the size.



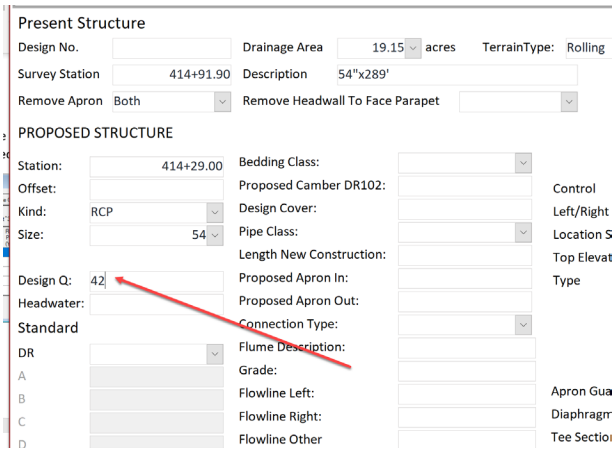
For this example, it will be 54”



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.

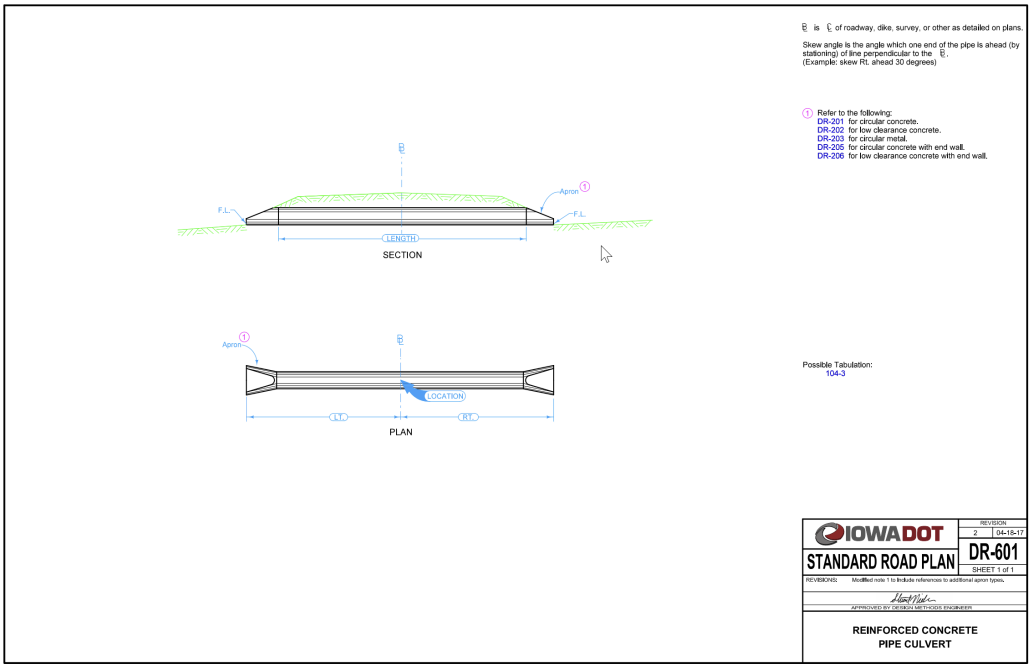


For this example, it will have a Design Q of 42 because it is designed for the 50-year flood event.

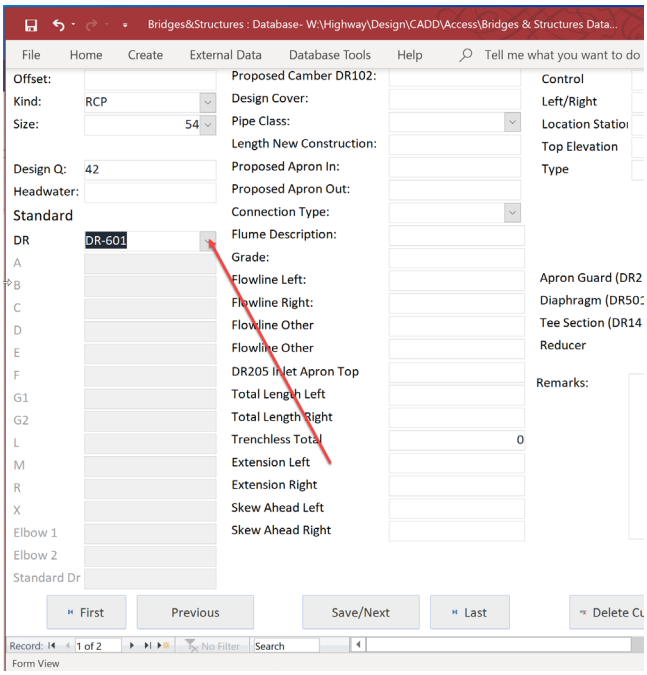


The Next field is the Headwater. This will need to be calculated for the larger structures. However, the example is small enough it is left blank.

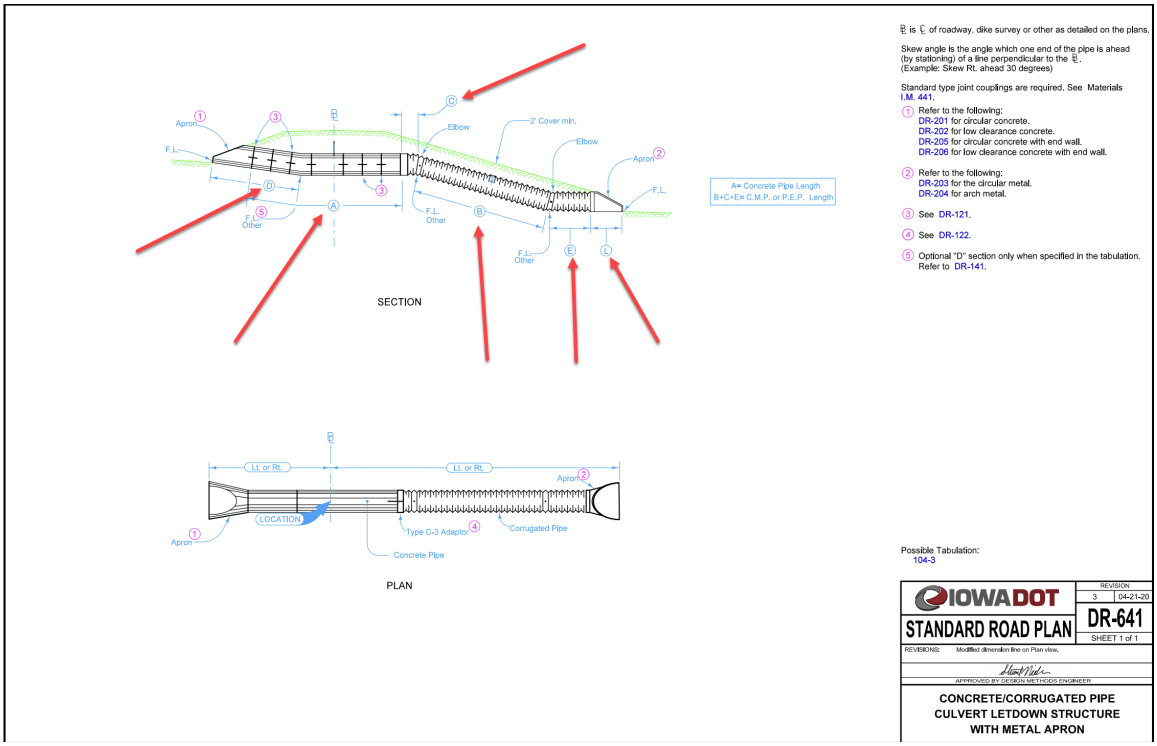
The next field is the design Standard of the proposed structure. Select the correct Standard from the Proposed Structure field by clicking on the pulldown in the DR field. For the example it will be a DR-601.



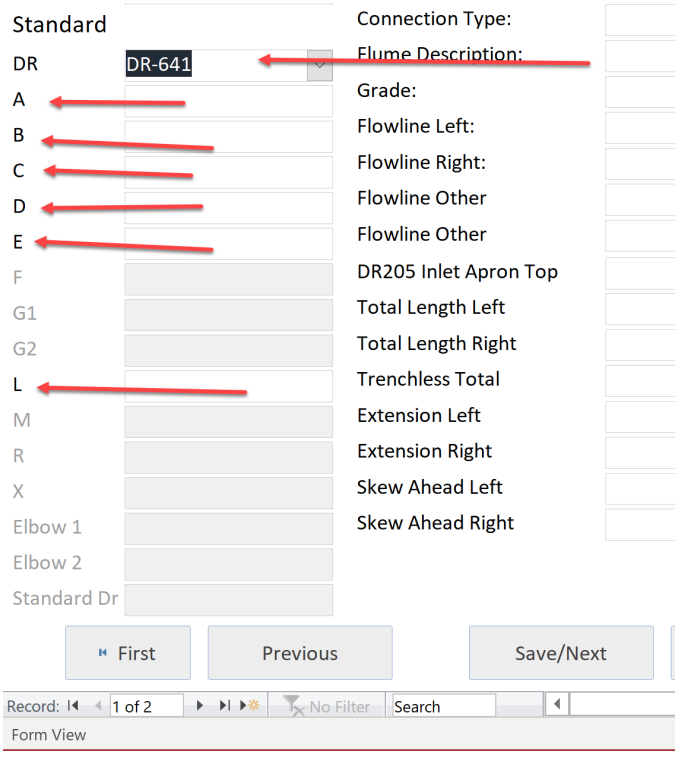
Note: For more information on the Iowa Department of Transportation drainage standards see the web page at this link. https://iowadot.gov/design/stdplne_dr



Depending on the DR Standard that is selected the appropriate information fields will become active. For this example, assume the standard used is DR-641



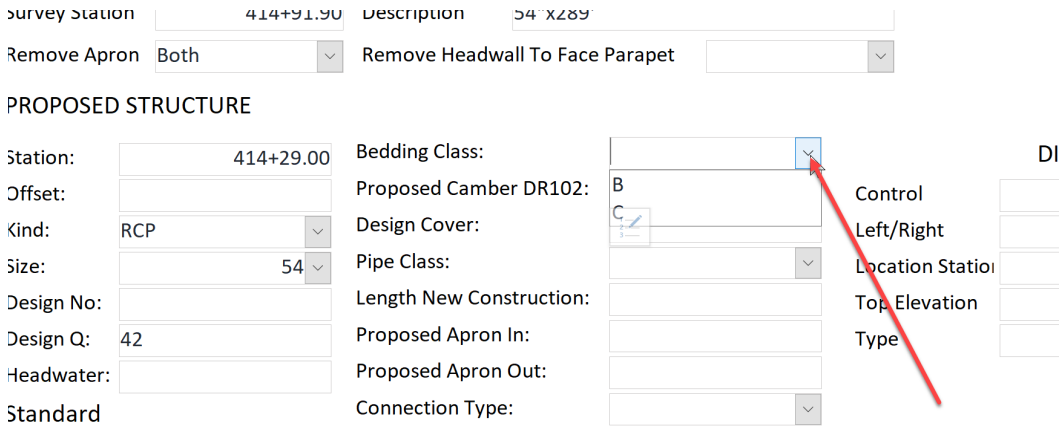
The information fields A,B,C,D,E and L are now active and the corresponding information will be filled in.



Note: When entering a DR-641 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.

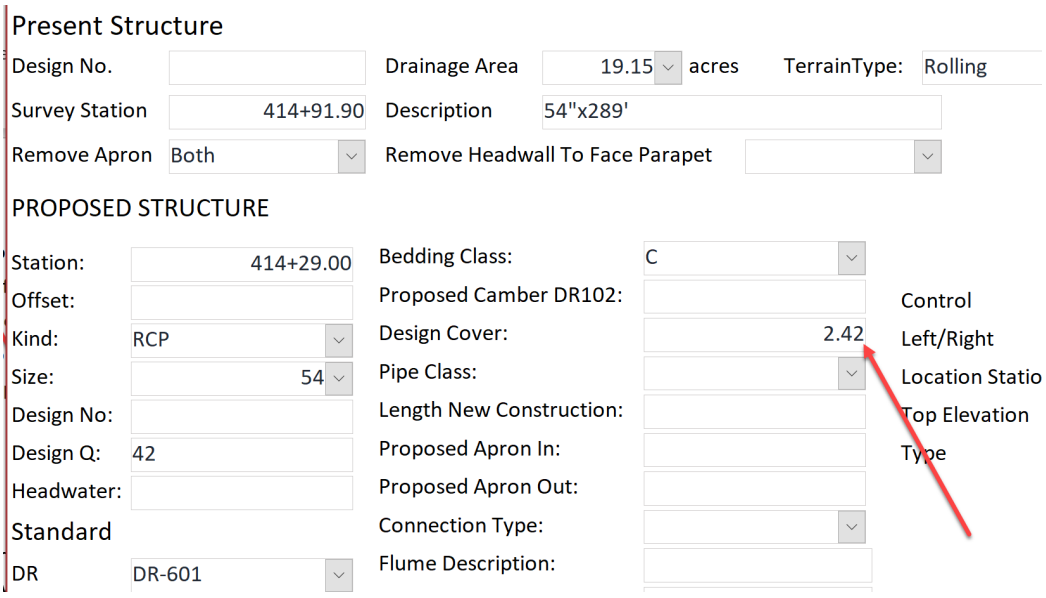
For this design example, use a DR-601.

Next, select the Bedding Class:

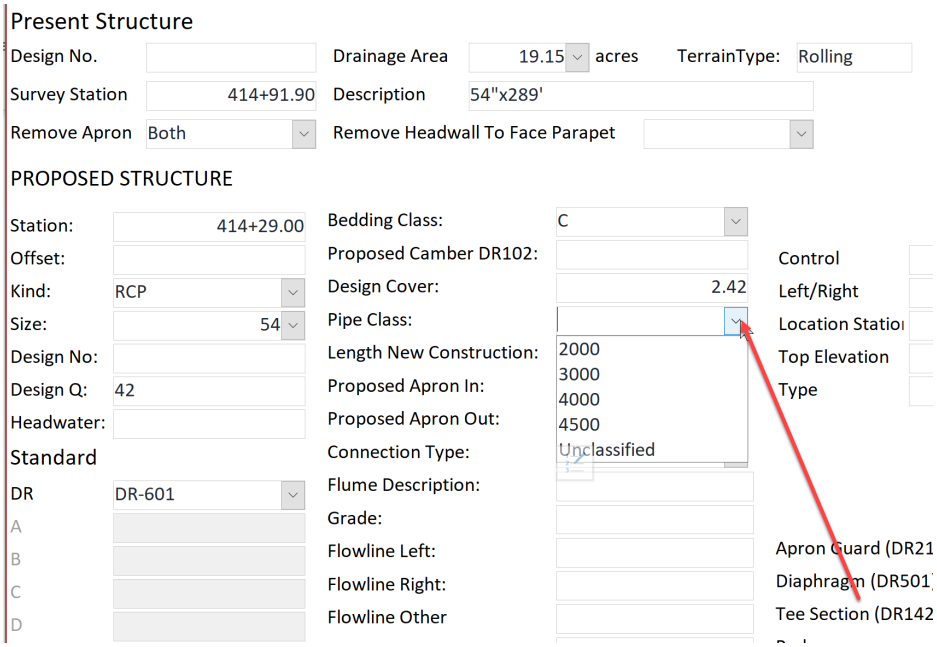


For pipes it will usually be Class C. However, refer to the DR-101 to verify.

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 DR-102 to verify. For this example, it will be 2.42

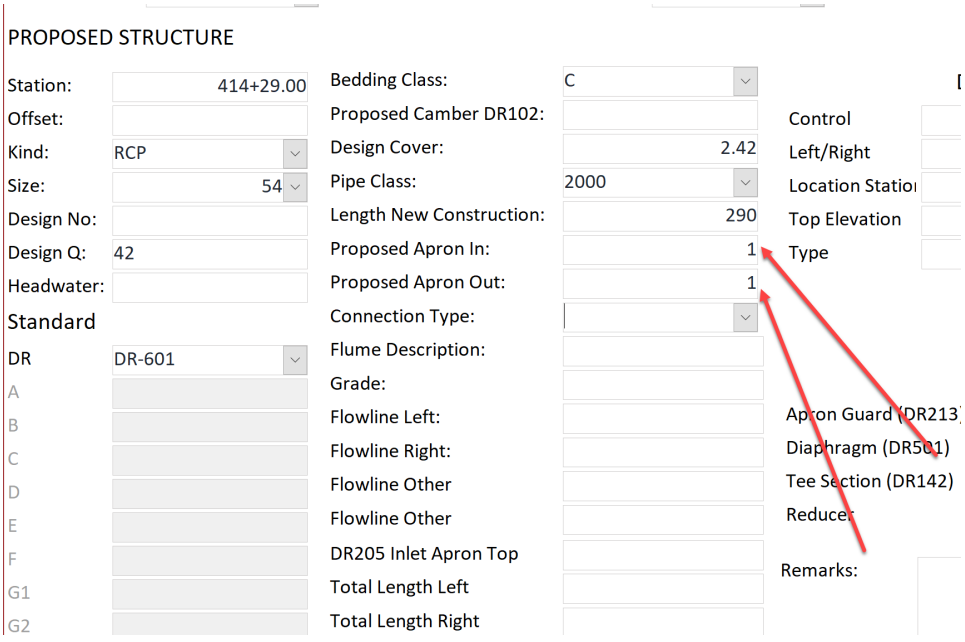


Next, decide what class of pipe is used for this design. This is determined by the design cover and Bedding Class. Refer to the DR-104 to verify. Use 2000 for this example.



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.

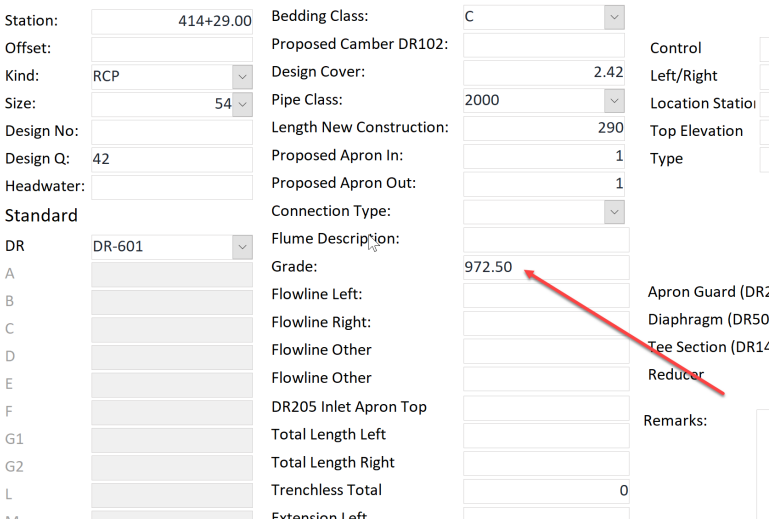


The next field, Connection Type, is for indicating if the design requires a connection type, either a DR-122 or DR-141. Select the correct standard and the additional field will appear for the corresponding information for that standard. This will not be used for this design.

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

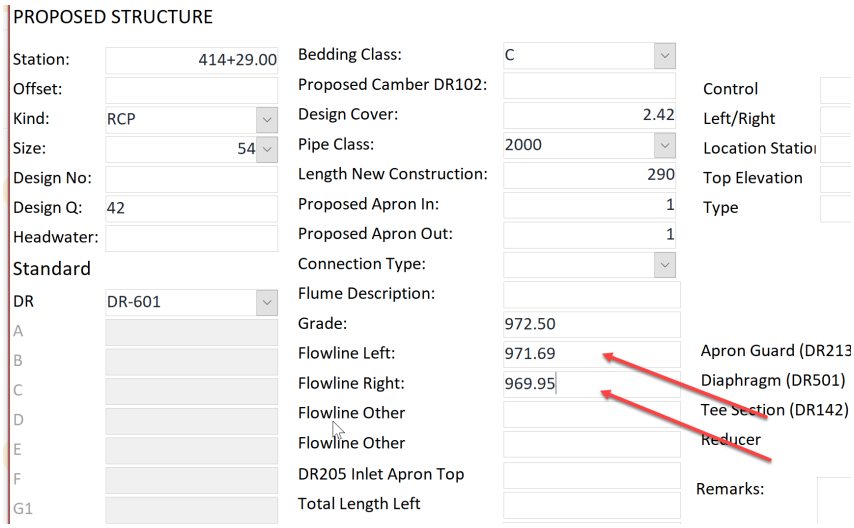
The next field is for the Grade. This is going to be the Profile Grade Elevation that was determined while designing the structure and annotated on the cross section. For this example, it will be 972.50.

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

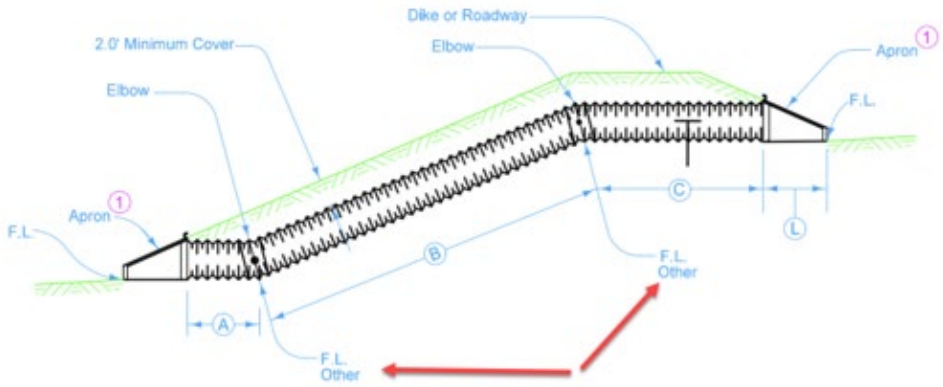


The next 2 fields will be Flowline Left and Flowline Right. This is the elevation of the flowline at the end of the pipe apron.

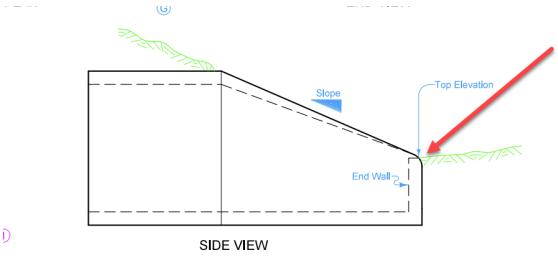
Note: The information was determined during the design process and annotated on the cross section for the next several fields. The cross section is a great source to use to fill out the following data.



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

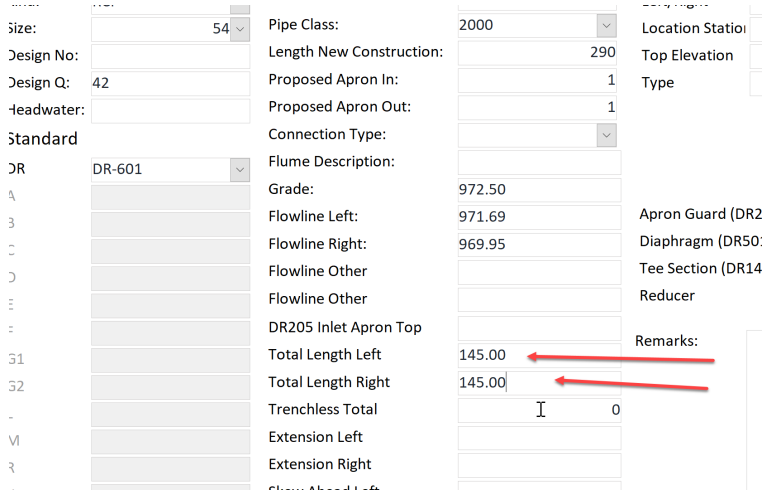


The next field , DR205 Inlet Apron Top, is for the elevation at the top of the end wall of a DR-205. If this apron is used in the design, enter the elevation here.

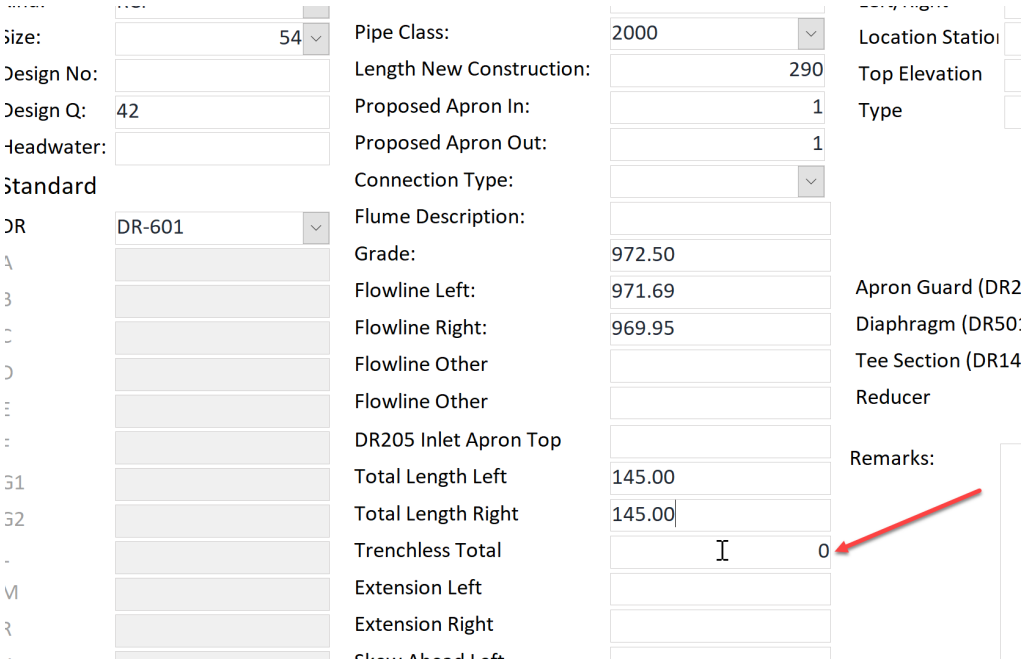


The next two fields are to report on the Total Length Left and the Total Length Right. This is the distance from center line to end of the apron.

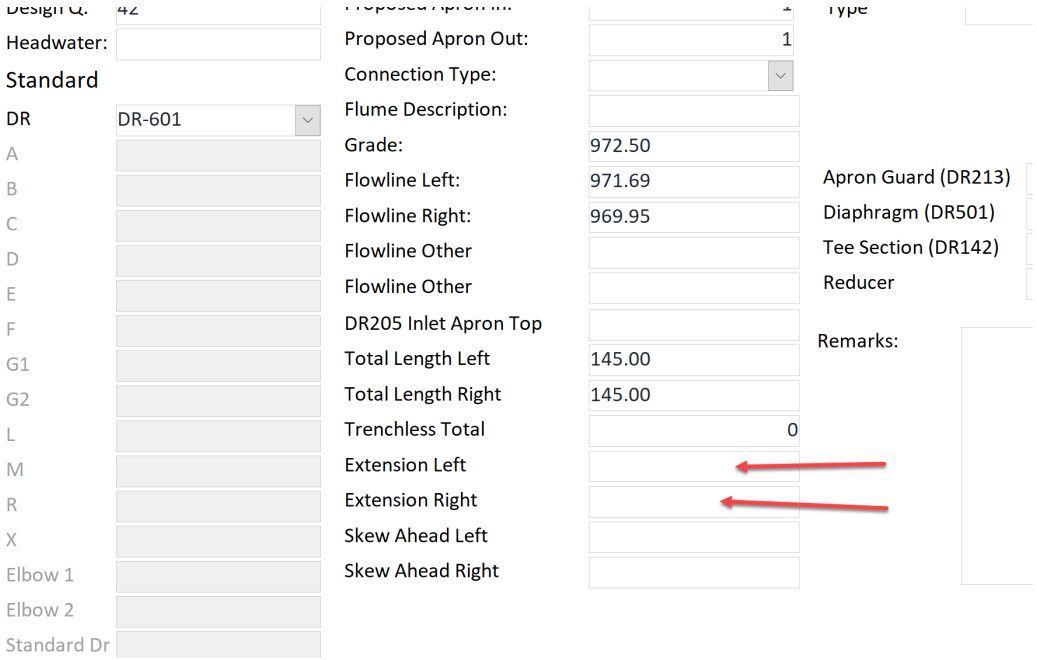
Note: If there is not an offset base line, this will be the offset of the point at the end of the apron.



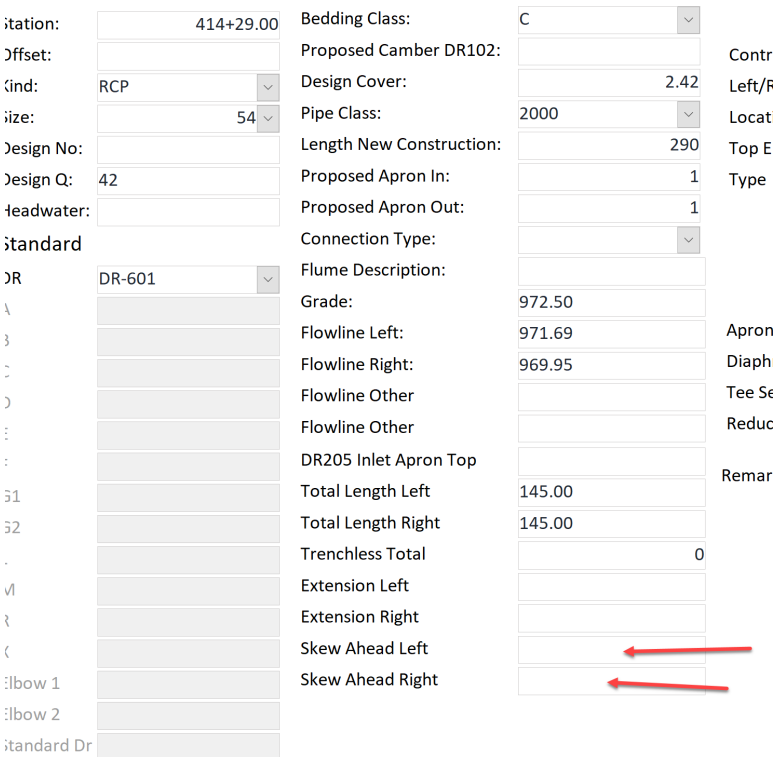
The next field is for reporting the Trenchless Total. This will refer to a pipe that requires to be jacked in place during installation as opposed to being replaced by cut and cover. This field is to enter the total distance of that pipe that is to be jacked.



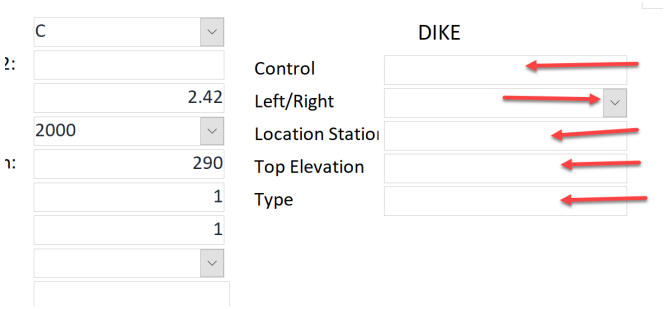
The next two fields are for if the design is to extend the existing structure. Enter the total distance in the direction of the extension that is to be constructed.



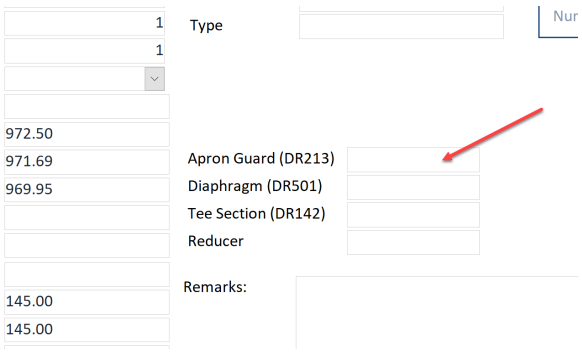
The next two fields are for if the structure is skewed, enter the degree of the angle of the skew in the appropriate field Right or Left.



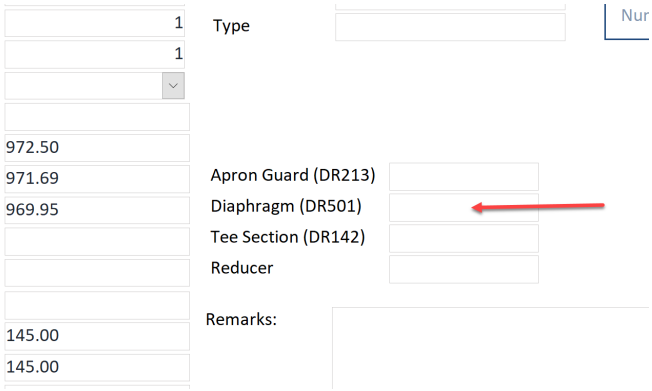
The next five fields are for when a dike is included in the drainage design.



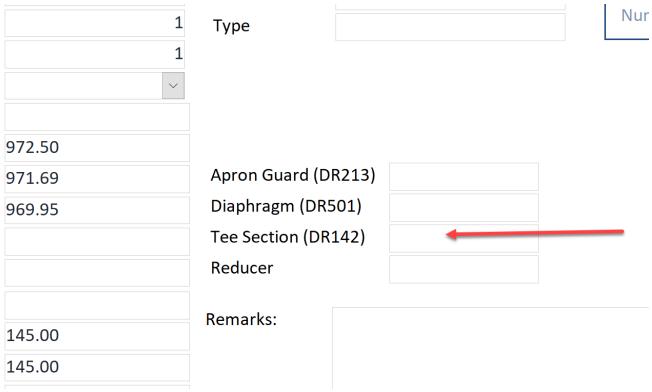
The next field is for if the design has an DR-213. Enter the number that is needed for that structure.



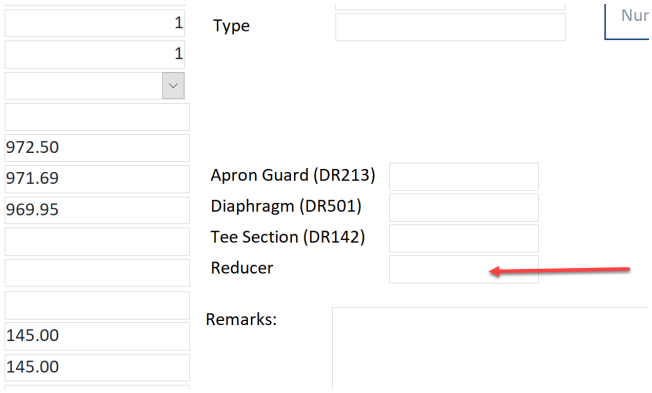
The next field is for when the design has an DR-501. Enter the number that is needed for that structure.



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



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

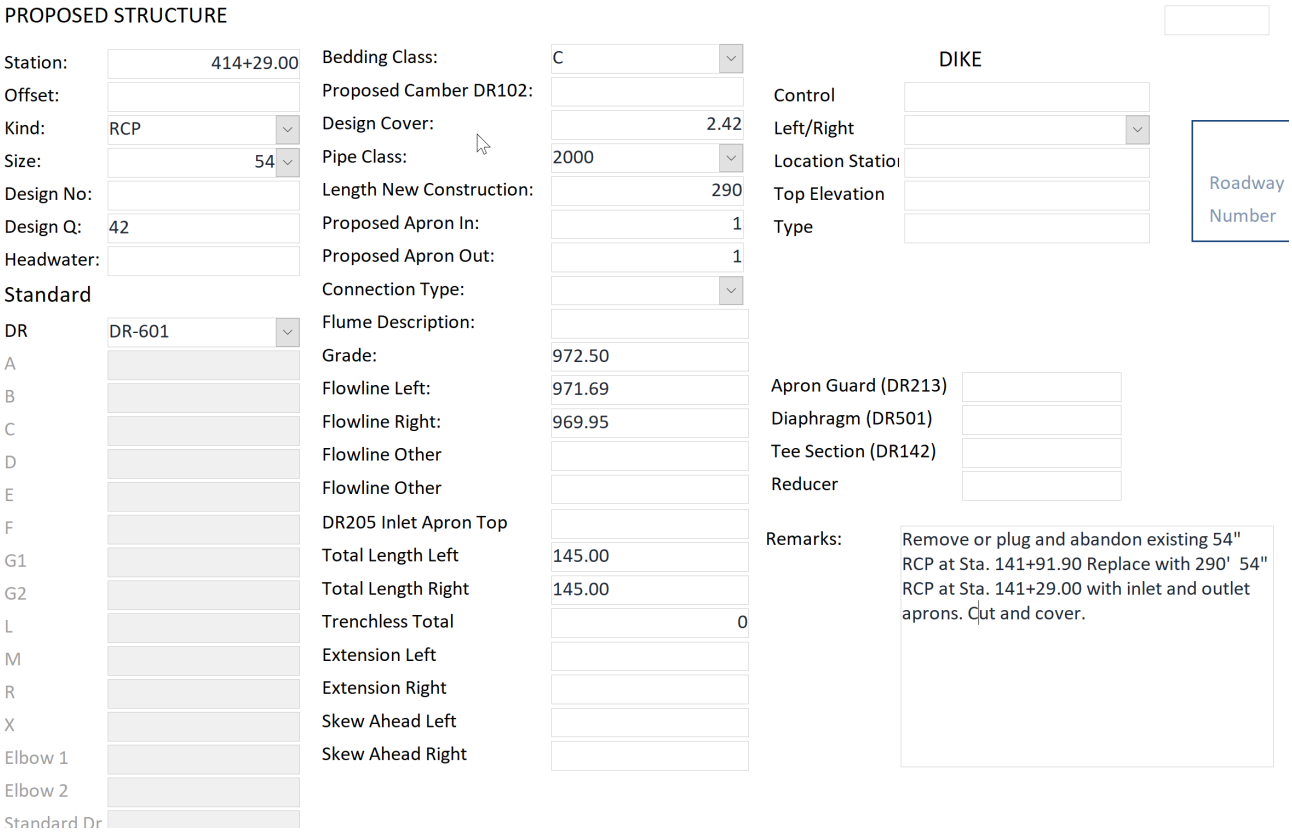


The next field is for Remarks. This is intended for the designer to include the design intent and direction on the staging of the replacement for the proposed structure.

Examples of typical remarks:

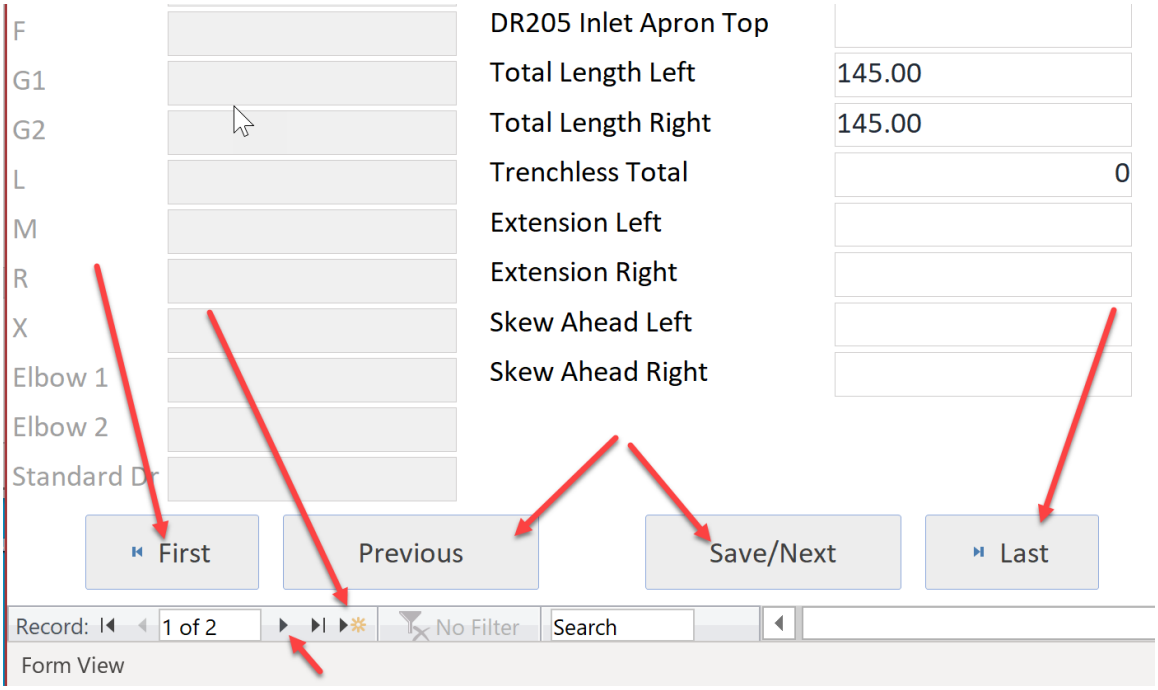
Plug and abandon exist median drain at Sta 1451+26. Jack 78’ of 24” RCP then lay one 6’ DR141 Type “D” double bevel section + apron on inlet end at Sta. 1452+25 – 51’ Lt
or
Remove 30 ft of existing 36 in RCP. Replace with 42 ft of 36in RCP with one DR-141 7.5-degree D section beveled end to the RT. Tie 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.

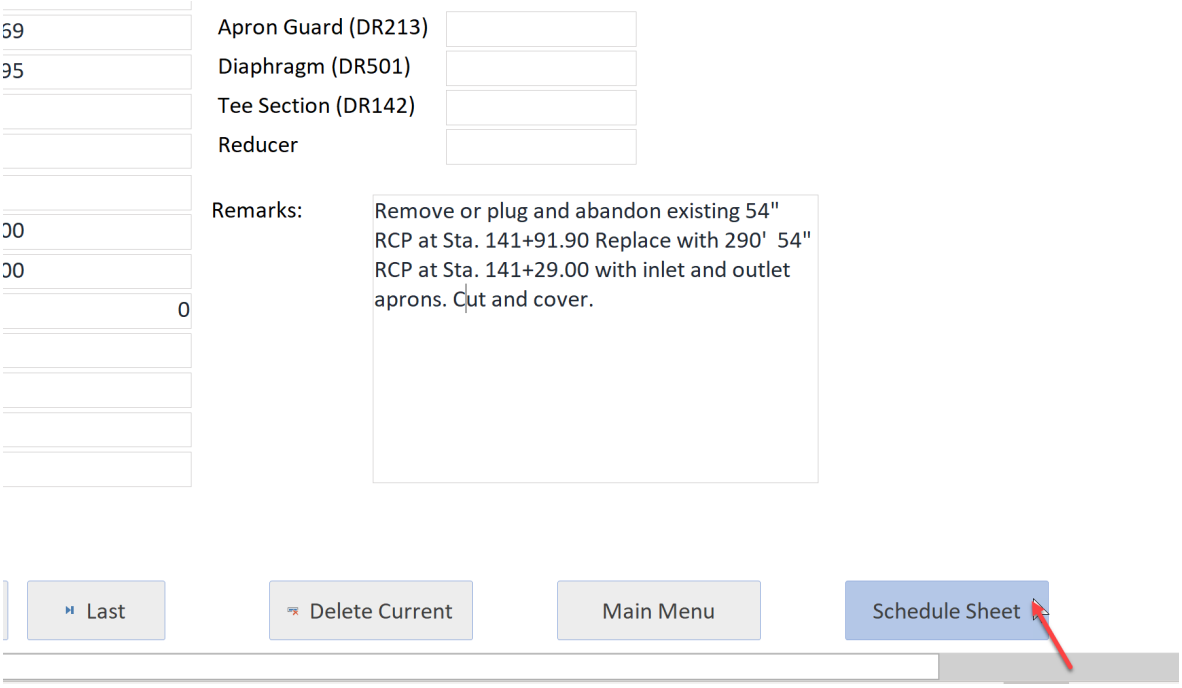


Once all the correct fields that corresponds with that structure standard are entered in the record, move to the next record and repeat the process. If the next structure is to be replacing an existing structure, find the records that were imported from the CCRRRPPP_PINKS.sccdb that corresponds with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

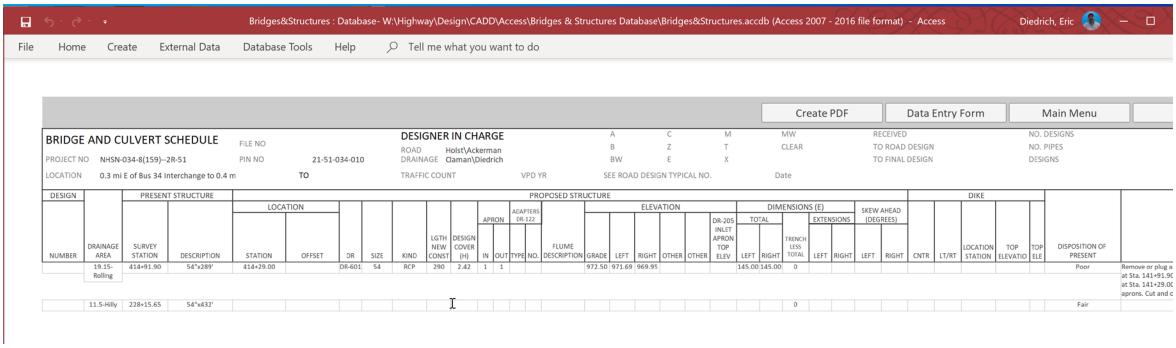
Click the buttons at the bottom of the record or the arrow buttons in the access database task bar to navigate to the desired record.



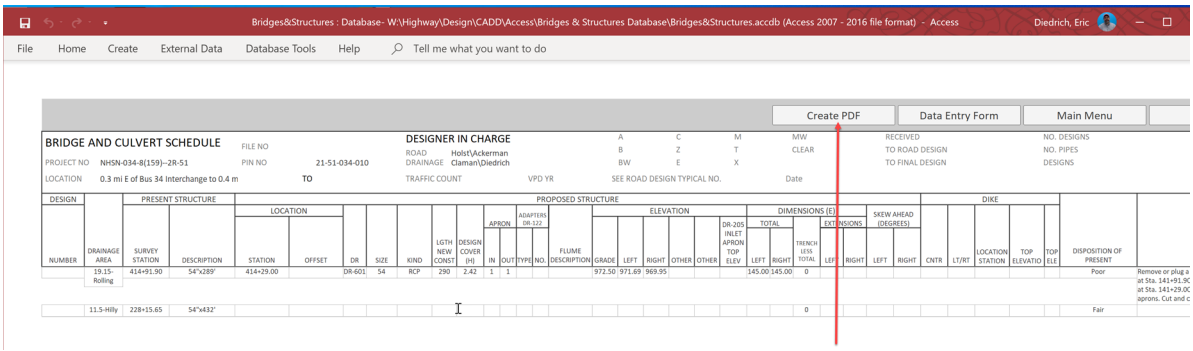
Once a record for each structure in the drainage design is finished, create the Schedule Sheet. Click on the Schedule Sheet button at the bottom of the record.



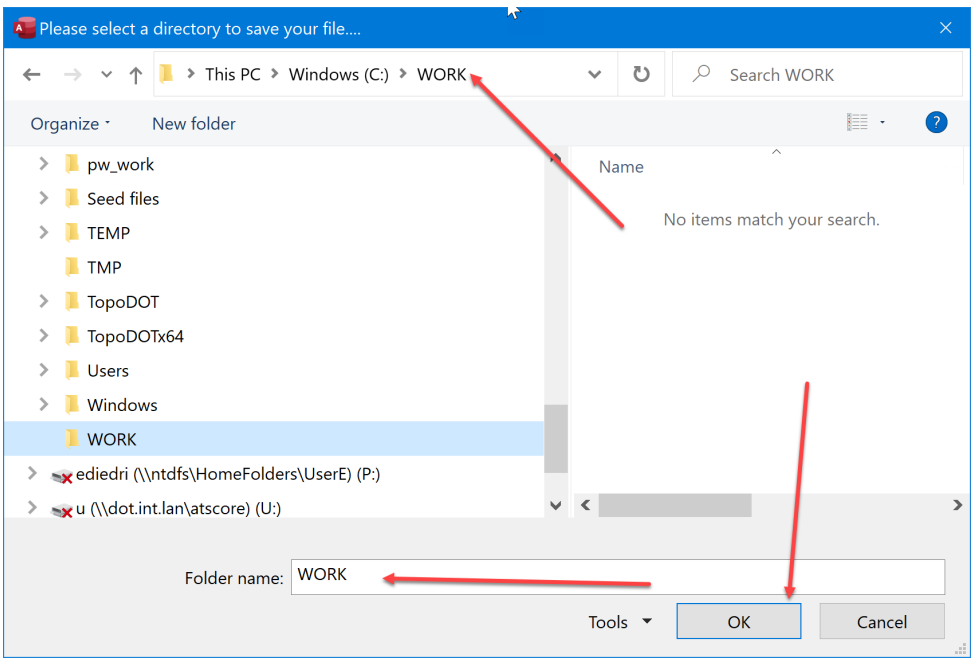
All the records in the project are compiled onto a Schedule Sheet.



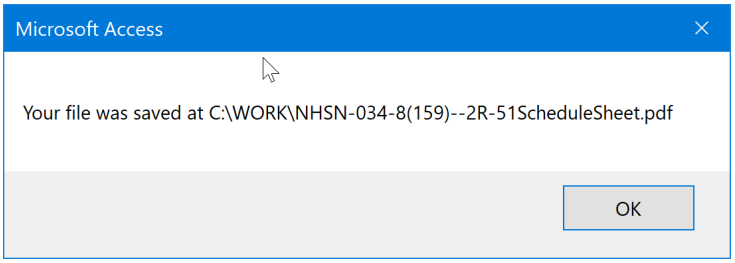
The next step, will be to create a PDF of the Schedule Sheet. Click on the Create PDF button at the top of the Schedule Sheet.



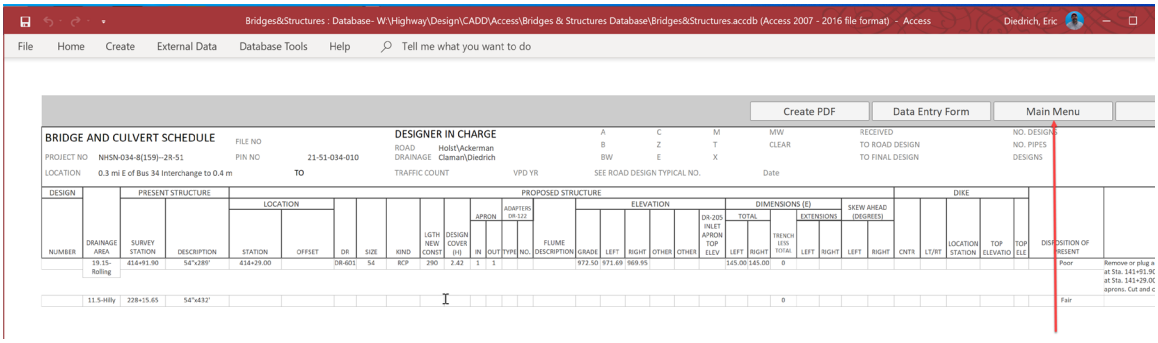
It will open the dialog box asking to select a directory to save the PDF file. For this example, use the C:\WORK directory that was created to download the CCRRRPPP_PINKS.sccdb to. Once the directory is selected, click the OK button.



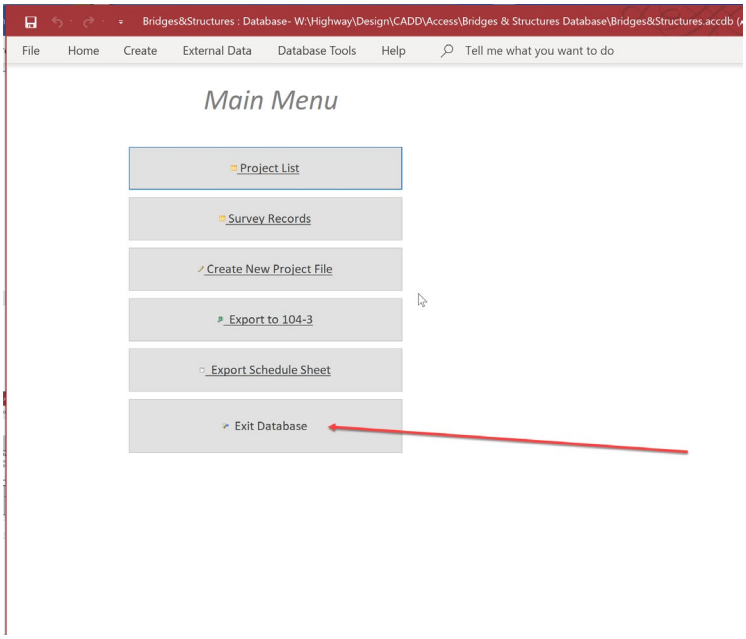
It will create the PDF of the Schedule Sheet in that directory and name the file Project NumberScheduleSheet.PDF. For this example it would be named NHSN-034-8(159)—2R-51ScheduleSheet.pdf. It will display a message to indicate when it is done. Click the OK button to dismiss.



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



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



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