

LAB 1 - Getting Started in InRoads for Bridge

Chapter Objectives:

- Setup a project with the correct resources including the creation and maintenance of an InRoads project file
- Identify and load the correct resources and files needed for bridge design
- Develop an understanding of what InRoads tools to use as they relate to real world design processes

Note: The *.zip file of the data set for these labs can be downloaded from the website [Labs for Bridge Essentials](#). The zip file should be extracted to the C:\Projects\ directory. If the labs will not be worked through sequentially, the data for each lab is also found in the Miscellaneous directory of the data set. To use the files from the Miscellaneous directory, copy the files in each specific lab folder following the instructions found in the *.doc file.

Lab 1.1 - Purpose of Bridge Essentials Labs

The Bridge Essential labs have been developed to demonstrate how InRoads tools can be used to facilitate the design and detailing processes of bridges and structures. These labs are intended as a supplement to the reference material and labs developed for the standard MicroStation and InRoads courses.

The labs are based on students having a basic understanding of MicroStation. A basic understanding of InRoads is preferable, but not required. Some of the basic InRoads concepts are covered in these labs only to explain more specific details as they relate to the Bridge workflow. However, for concepts that are not specific to the Bridge workflow, refer to the reference material for MicroStation and InRoads to gain a fundamental understanding of the CDOT engineering software environment.

For those with little or no experience with InRoads, use the links below to access standard MicroStation and InRoads reference material related to this lab.

From *A Practical Guide for Using MicroStation XM*

- ◆ [Chapter 1 - Introduction to CDOT](#) - This chapter documents helpful CADD resources available to the student and links to those resources.
- ◆ [Chapter 2 - Getting Started in MicroStation](#)- This chapter documents the basics of the MicroStation interface including mouse mechanics, the MicroStation Manager window, and description of the toolbars.
- ◆ Another important chapter for the student to understand is [Chapter 3 - Levels](#). Use this link if you are not familiar with how levels are organized and how to use them.

From *A Practical Guide for Using InRoads XM*

- ◆ [Chapter 1 - Getting Started in InRoads](#) describes where to find and store files used in InRoads, how to setup a project directory, and best practices for setting up InRoads to automatically use the correct InRoads files and point to the correct InRoads folders.
 - ◆ [Chapter 2 - InRoads Options](#) provides instruction on what Locks are and how to use them in addition to setting up the display precision for reports and setting the scale factors for how InRoads displays text, cells, and line styles.
1. Use the following link to see what other training material, including reference material and labs, is available for your use: [Manuals, Training Materials, and Resources](#).

Lab 1.2 - Review of the Project Directory Structure

Project Setup

Setting up a project directory is generally performed by the Project Manager. However, a standard project directory structure can also be used to store data that is not part of a formal project. Benefits of setting up a standard project directory in these cases include:

- Ensures that predictable MicroStation and InRoads resources are being used to develop the data
- Facilitates the transfer of data to/from other project participants, entities, or storage areas
- Reduces need for support and associated downtime

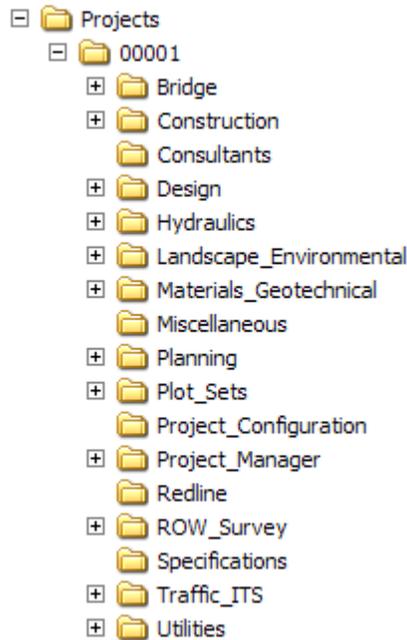
The standard project directory structure is suitable for small and large projects, projects in a network environment or stand alone projects, and even projects in the ProjectWise environment. By using this standard directory structure, Bridge users will be able to find the data they need from other specialty groups and in return specialty groups will be able to find the data supplied by bridge.

The next few steps will illustrate how to create a project directory for a stand alone project.

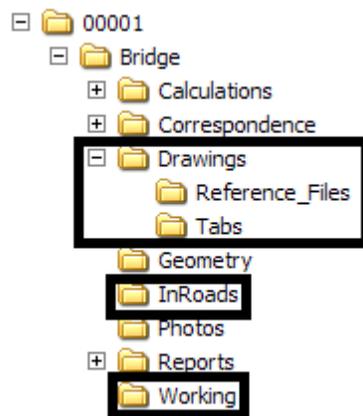
Note: Because a stand alone project does not have a project code use a project code of **00001** as the project number.

1. Follow the steps outlined in the section “*Creating the Project Directory*” found in [Chapter 1 - Getting Started in InRoads](#) of *A Practical Guide for Using InRoads XM* to create the project folder.

- Open **Windows Explorer** and navigate to the new 00001 project folder.



- Expand the **Bridge** folder.



The folders highlighted in the image above are the folders that will be most often used during this course and the normal design process.

In addition to these folders, files in the **ROW_Survey\InRoads** and **Design\InRoads** folders will be used as a basis for bridge and structure design.

- The topographic survey file will be found in the ROW_Survey\InRoads folder.
- The proposed roadway alignment and surfaces will be found in the Design\InRoads folder.

Lab 1.3 - InRoads Terminology

The following steps will show how the user how to use the Help system that comes with the product to find definitions to unfamiliar terminology.

1. Launch ***InRoads Help*** by going to **Help > Contents** in the InRoads application window.
2. On the ***Contents*** tab, click on **Supplemental Information > Glossary**.
3. Look up the following terms in the **Glossary**:
 - a. Original Surface and Design Surface
 - b. Digital Terrain Model
 - c. Perimeter
 - d. Geometry Project
 - e. Alignment
 - f. Corridor
 - g. Project and RWK

Lab 1.4 - Understanding How Project Design Data is Stored

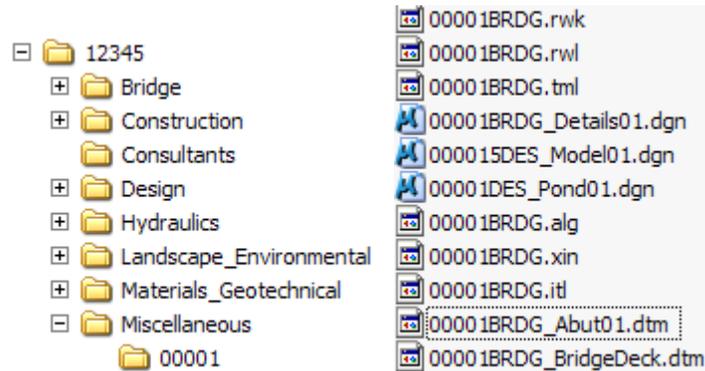
This section will help you understand how the different design features, such as surfaces, alignments, and typical sections, relate to InRoads file types. Managing InRoads data will be a lot easier if you have a good understanding of this relationship. The following table shows how InRoads file types relate to design elements.

| Design Element | InRoads File |
|--|--------------|
| Surfaces - Topographic (existing) or proposed design | * |
| Alignments | *.alg |
| Typical sections (templates) | *.itl |
| Modeling (corridors) | *.ird |
| Control how graphics look (preferences) | *.xin |
| InRoads project | *.rwk |

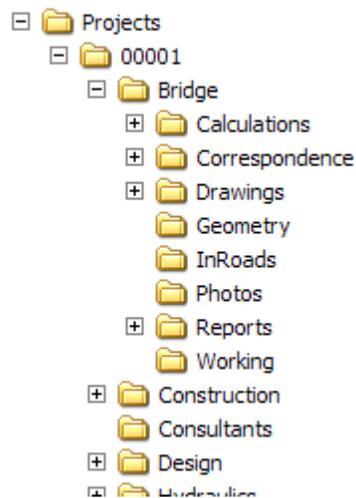
Additional information on how these file types in the section “***InRoads XM Resource Locations***” found in [Chapter 1 - Getting Started in InRoads](#) of ***A Practical Guide for Using InRoads XM***.

The next few steps illustrate a practical application of how to manage InRoads data in the project directory structure. There are several files located in the \Miscellaneous directory of project 12345 that need to be moved to the project 00001.

- Open *Window Explorer* and navigate to the directory \12345\Miscellaneous.



- Move all the files that begin with *00001* to the correct folders in the \00001 project directory.



Note: Each discipline has a standard acronym. Use this acronym to determine the folder the file should be placed in (e.g. BRDG is the acronym used for the bridge group).

Note: The contents of these files are irrelevant. Only the filenames are important in this exercise.

- Identify the one file that should not be used from the project directory structure because it is not a standard file.

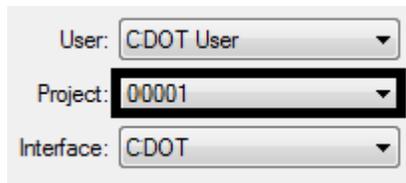
Note: Notice that there is only one geometry (*.alg) file for bridge. A good practice is to store all alignments in one geometry file. There are only a few situations that would require using more than one geometry file.

Using Project Defaults

InRoads *Project Defaults* are a way to improve the process of loading and saving InRoads files by setting a default path to the project folder where the resource should be located. This is accomplished by using another file type with the extension *.reg.

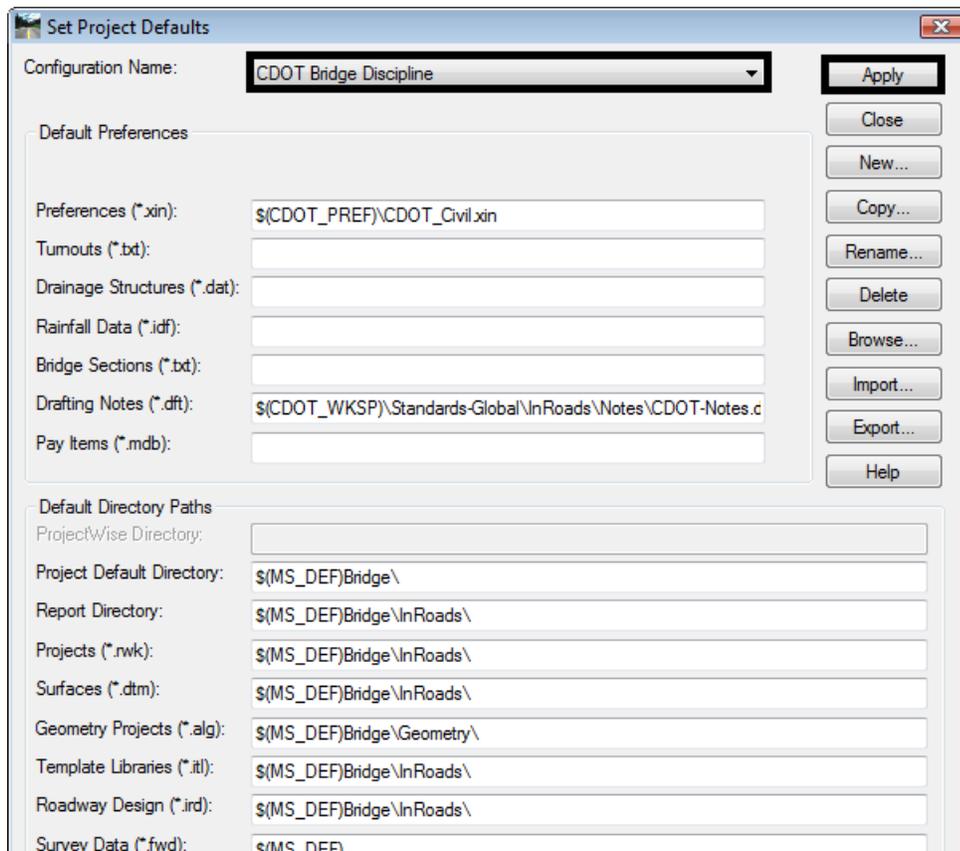
- Launch MicroStation and set the *Project Workspace* to **00001**.

Note: You will need to revisit the MicroStation Manager window to set the project workspace to 12345 for subsequent labs.



User: CDOT User
Project: 00001
Interface: CDOT

2. Open the file **00001BRDG_Model.dgn** from the directory **C:\Projects\00001\Bridge\Drawings\Reference_Files**.
3. Launch InRoads by clicking on the  icon.
4. Follow the steps in the workflow [CDOT InRoads XM Project Defaults Management](#) to import the standard CDOT project defaults and set the **Configuration Name** to **CDOT Bridge Discipline**.
5. Click **Apply** and then **Close** the Project Defaults dialog box.



Set Project Defaults

Configuration Name: CDOT Bridge Discipline

Default Preferences

Preferences (*.xin): \$(CDOT_PREF)\CDOT_Civil.xin

Turnouts (*.txt):

Drainage Structures (*.dat):

Rainfall Data (*.idf):

Bridge Sections (*.txt):

Drafting Notes (*.dft): \$(CDOT_WKSP)\Standards-Global\InRoads\Notes\CDOT-Notes.c

Pay Items (*.mdb):

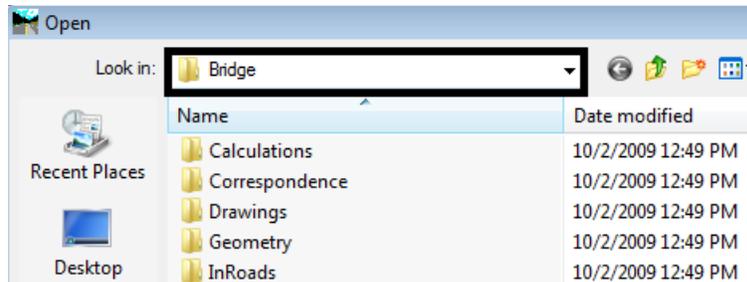
Default Directory Paths

ProjectWise Directory:

Project Default Directory: \$(MS_DEF)Bridge\
Report Directory: \$(MS_DEF)Bridge\InRoads\
Projects (*.rwk): \$(MS_DEF)Bridge\InRoads\
Surfaces (*.dtm): \$(MS_DEF)Bridge\InRoads\
Geometry Projects (*.alg): \$(MS_DEF)Bridge\Geometry\
Template Libraries (*.tli): \$(MS_DEF)Bridge\InRoads\
Roadway Design (*.ird): \$(MS_DEF)Bridge\InRoads\
Survey Data (*.fwd): \$(MS_DEF)

Buttons: Apply, Close, New..., Copy..., Rename..., Delete, Browse..., Import..., Export..., Help

- From the InRoads interface, select **File > Open**. Notice how InRoads now defaults to the Bridge folder of the project.



There are two keys to getting project defaults to work correctly:

- Load the correct pcf file by choosing the correct project workspace in the MicroStation Manager window
- Set the project default configuration name to *CDOT Bridge Discipline*

Lab 1.5 - Requesting InRoads Design Data

Before starting a Bridge project, you will need to load InRoads data files that have been created by other groups. The following is a list of these InRoads data files. Request the files from the appropriate contact person in each group.

| Design Element | InRoads File | Responsible Group |
|--------------------------------------|--------------|-------------------|
| Existing surface | * | Survey |
| Proposed (design) surface | * | Roadway Design |
| Proposed (design) alignments | *.alg | Roadway Design |
| Roadway Typical Sections (if needed) | *.itl | Roadway Design |

The files should be copied into the *Bridge\InRoads* folder. The responsible group should update the Bridge group if any changes are made to these files, including:

- Additional/new survey data
- Revised alignments (horizontal and vertical)
- Revised typical sections
- Additional work at approach to structures

Lab 1.6 - Using the Bridge Toolbar to follow a Workflow

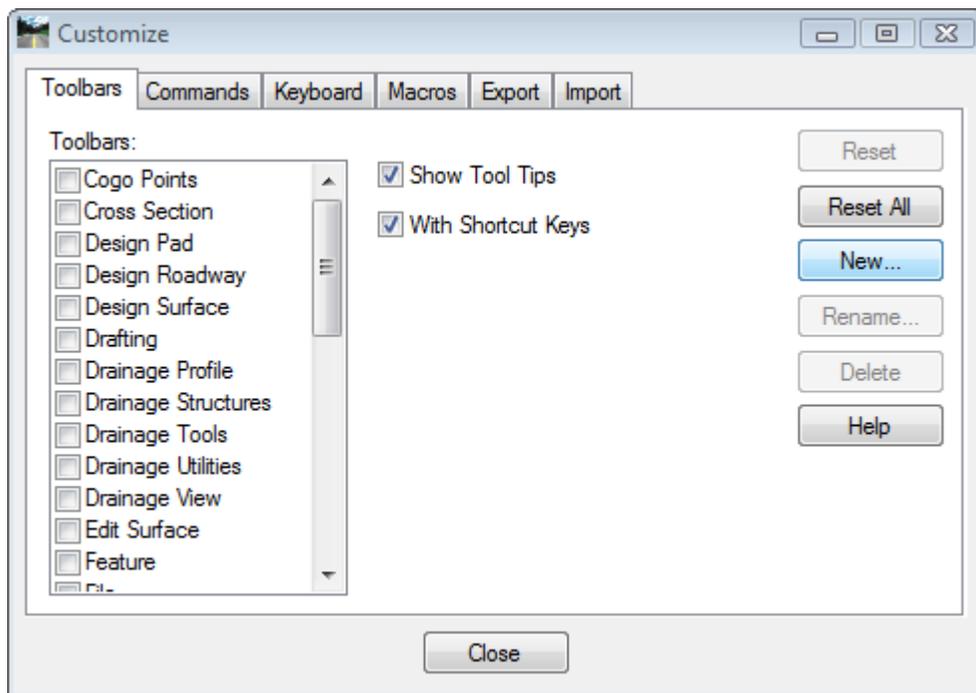


Not all InRoads tools are relevant to Bridge design and detailing processes. In addition, some tools are used more often than others. The purpose of the Bridge toolbar is to organize the most commonly used InRoads tools in a concise, sequential order and make them easily accessible.

The toolbar is not intended to be complete at this time but has been created to introduce bridge designers to the toolbar concept. With input from the bridge group, it is expected that the toolbar will change over time according to the needs of the group.

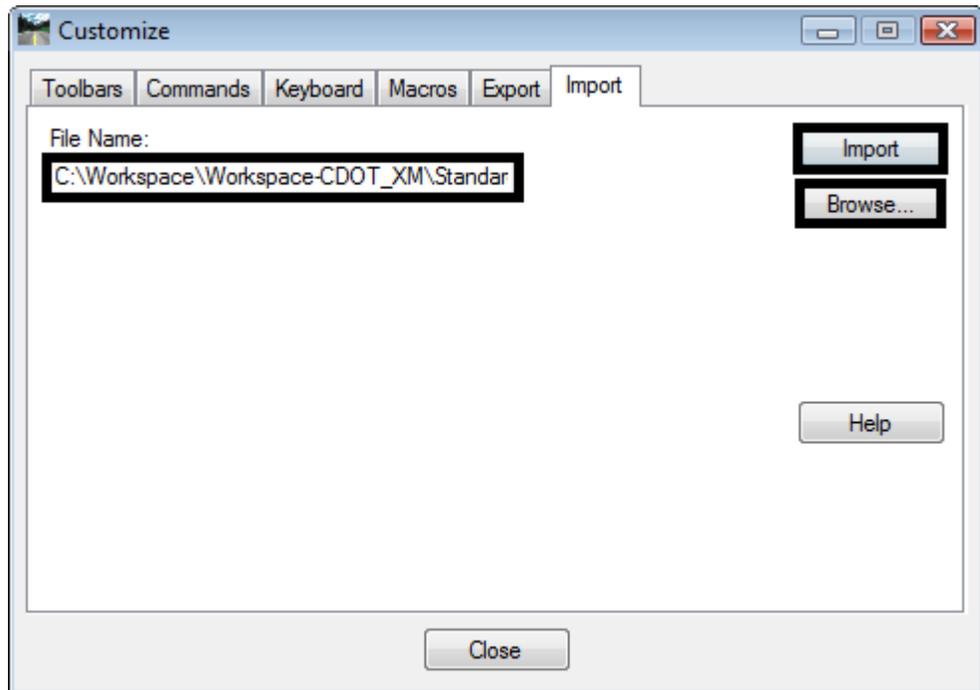
The toolbar needs to be loaded manually. Once loaded, the toolbar resides in the registry of the computer and only needs to be loaded again if it changes.

1. Load the **Bridge Design** toolbar by selecting **Tools > Customize**. The **Customize** dialog box will appear.

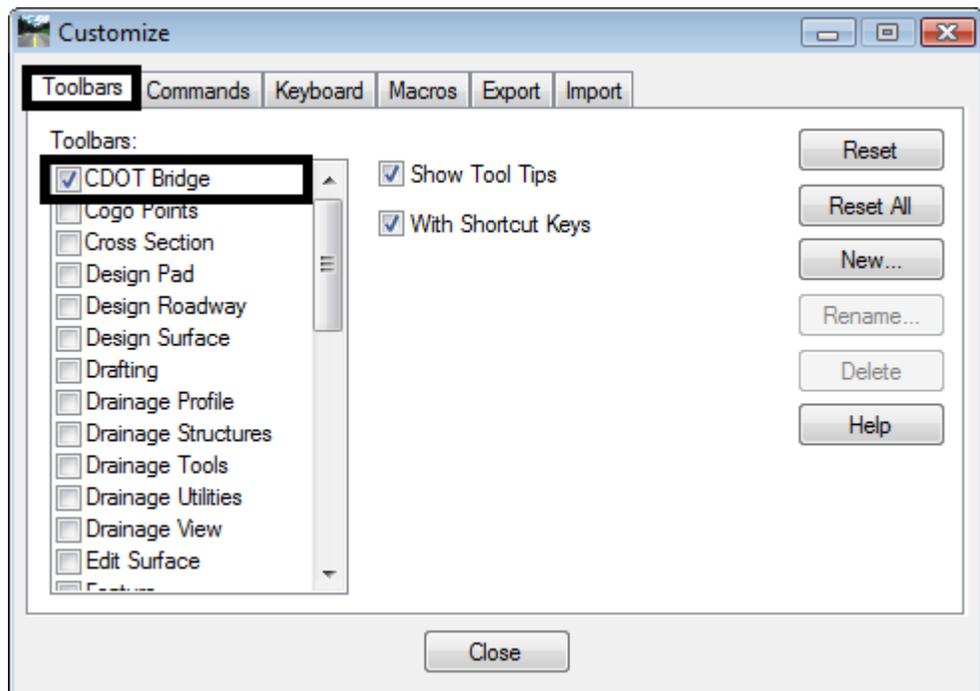


2. Click on the **Import** tab and choose Browse.
3. Select the **CDOT Bridge.tbr** file from the **C:\Workspace\Workspace-CDOT_XM\Standards-Global\InRoads\Interface** directory.

- Click on **Import**.



- Click on the **Toolbars** tab
- Check on **CDOT Bridge** in the **Toolbars:** area. The CDOT Bridge toolbar will appear on the screen

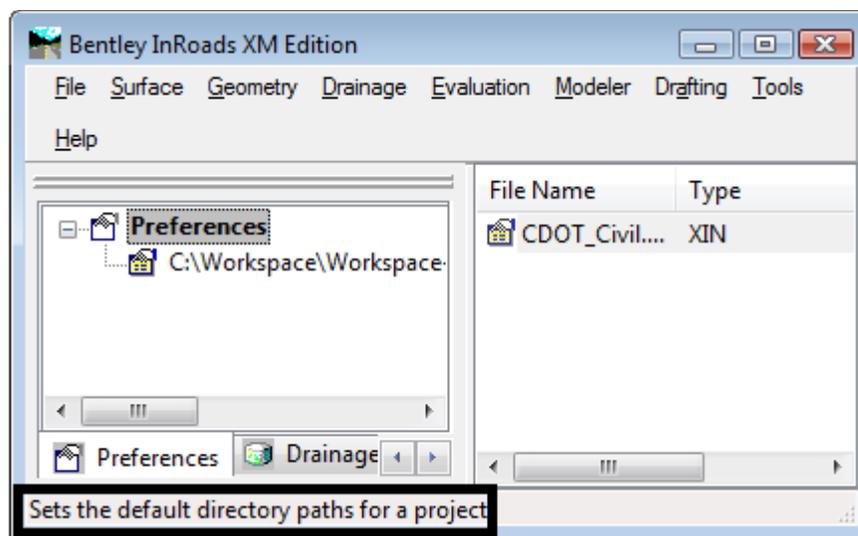


- Close the Customize dialog box.

8. Click on the title bar of the CDOT Bridge menu to make it active.
9. Hover over the *Project Defaults* icon. A *tool tip* appears to indicate what tool the icon represents.



10. An explanation of what the tool does also appears in the lower left of the InRoads application window.



For now, the toolbar is divided into the following sections:



- a. Project Defaults - Used to set the default paths to InRoads files
- b. View Surface - Used to evaluate a surface including displaying the contours or surface features
- c. Review Horizontal Alignments - Used to display and annotate horizontal alignments and generate alignment reports
- d. Profiles and Vertical Alignments - Used to generate and annotate profiles
- e. Cross Sections - Used to generate and annotate cross sections

The Project Defaults tool was explained in this lab. The other tools on this toolbar will be explained in the next lab.

11. Now that you understand how to create a project and manage the data within a project directory structure, **Delete** the project *00001*.

Chapter Summary:

- Using the standard project directory structure will make it easier to manage project data and facilitate the correct usage of InRoads resources.
- Using Project Defaults will make it easier to save and retrieve InRoads files to/from the correct project folders.
- Using the Bridge Toolbar will reduce the amount of time looking for the correct InRoads tool. In addition, the toolbar is workflow based, allowing the user to quickly find the correct tool based on the design stage being worked on.

