

Plans Preparation Manual  
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\*(A CADconform Publication)**

# Appendix A-1

## Plans Preparation Manual

### Project Design Execution

This is a step by step guide to help in the process workflow of Design Branch project creation and development, culminating in the preparation of contract advertisement documents and project document archivals. Every attempt has been made to provide guidance to the engineer and/or technician for the processes involved in execution of each project. It is understood that many of the processes described herein are generic. Different processes are required for various disciplines in the project development workflow. Therefore these variants are described in varying detail as needed.

The Process steps will be general in nature in order to alert the user of which items need to be accomplished in the order necessary to complete the process in a comprehensive manner. The workflows for specific procedures such as Project Wise or InRoads model development for example will be detailed in separate workflows in Appendix A. No attempt has been made to identify PDT member duties and responsibilities. For the purpose of this document, PDT processes do not detail workflows for the technical production of project design documents and neither does this document pretend to detail PDT processes.

There are also included in this set of workflows and procedures subjects such as design document layout, presentation, and design scale in order to improve the presentation quality of the design product. While it is true that our work products are developed and completed in a digital format, printed documents are the final product format for the sighting and construction of the physical project features. In other words, the presentation quality and professional appearance of our project design documents should be of a high caliber. Inattention to design document quality attracts negative and critical response.

## **Project Development Process Steps**

### **Step 1. Project Initiation steps**

- Perform a data search for existing related project information such as:
  - Engineering Documentation Report (EDR)
  - Detail Design Report (DDR)
  - Geotechnical Data
  - Hydraulic and Hydrological data/criteria required for project design
  - Existing Surveys of the geographic area of the project site location
    - (Survey information should be detailed enough to achieve a comprehensive project design)
- Review and understand the A/E/C CADD Standards and include the compliance effort when planning for the execution of the design and creation of the design files.

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- Identify and prepare project scope

**Step 2. Setup Process**

- Identify project design members who will be the production team.
- Identify and assign roles and responsibilities for each team member.
- Determine generic title and decide on project abbreviation to use in naming project design files.
- Create new or utilize existing project description consisting of 6 characters which will be used for all design file names throughout the project.
- Develop a rough-draft index outline that includes all disciplines. This focus on project document content will force members to identify the level of effort as related to the number of sheet required. Careful consideration of this effort level will result in a realistic estimate of man-hour requirements and personnel schedule assignments.
- Review the Standards compliance requirements for naming sheet and model files for each discipline.

**Step 3. Project Wise (PW) Engineering Documentation Management System (EDMS) - Project Data Creation Process**

- The Project Technical Lead or lead engineer shall provide to the Project Wise Administrator the essential project information needed to create the project folders, disciplines included in the project execution, and team members that will be producing drawings for the project.
- Submit information to one of the PW Team Administrators (Roger Porzig @ 232-1189, Troy Weber @232-1994, or Pete Kendrick @ 232-1912) and request the project be created in the Project Wise Document Management System.
- The PW Administrator Team creates workspace configurations for all folders and subfolders for the project. The emboldened text below indicates a suggested folder naming scheme.
  - **Project Files** -
  - **Discipline Name Folder, (i.e. Civil)** – Sheet file folder for each discipline’s subfolder.
  - **Project Data Files** – files for calculations, project documents.
  - **InRoads** – InRoads files for a subfolder under the Civil and Geotechnical disciplines’ folders only.
  - **Model** – model files related to discipline.
  - **Working** – files for preparation to develop work.
- The workspace configurations are assigned to a previously created set of folders named like those above. The folders are created for each discipline and are set up for each project by the PW project admin team.

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### Project Design Execution

- The work space contains configured paths to resources such as seed files, cell libraries; InRoads configuration files, etc. (*see the Workspace description in **Appendix A***).
- The **General** discipline folder copied from the SAJ\_EN Workspace folder in Project Wise, consists of resources such as project border/title block, project index template, and cover sheet.
- Project Wise document names should be consistent in form throughout the project.
  - PW formats should be used to simplify the project maintenance process. Each PW file is assigned a database record. Each record contains a Document Name a Description, and a File Name. These three fields can be used to populate the Index sheet information. Management of reference files and sheet files can be made easier if the following format is used.
    - Model files:
      - Document Name: Use the sheet feature name (Plan, Detail, Section title name when possible).
      - Description: Use to define the where the reference will be used in sheet files.
      - File Name: Use the AEC Standard Model File Name.
    - Sheet Files:
      - Document Name: Sheet drawing number (C-102)
      - Description: Index Sheet Description
      - File Name: Use the AEC Standard sheet file name.
  - Sheet file Document names and Description fields can be exported to an Excel file and imported to the index file and avoid the tedium of retyping all file information into the index sheet.
- All documents related to the project should be place in the Project Wise project folder.

#### **Step 4. Project Wise (PW) Sheet Size Selection Process**

- The default size sheet for all projects is ANSI D “34”x22”
- The sheet size ANSI E (44”x34”) is appropriate for projects where the scale consideration encompassing extremely large geographic project area.
- Remove unneeded template files from the general folder that are sizes other than what are needed for the project. once the project sheet size is determined.

#### **Step 5. Revise Project DGN Templates**

- Open the Project Wise project directory and select the *General Discipline* folder.

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- Rename the cover, border and index files to the project's abbreviated title and standard file names. *Note* – See AEC Standard for electronic design file naming guidance. The cover, abbreviations and symbols, Index, location and vicinity map files are all sheet files and should be named as sheet files.
- Determine the P2 number assigned to the project. This number will be a prefix for all sheet files for the project.

**Step 6. Project Design Preparation Procedure**

- Begin project design development
  - First, determine the number of sheets based on scales used to convey information for plans, sections, elevations, details, etc.
  - Next refer to the rough index with preliminary sheets for each discipline. This is a good method of planning for the sheet and sheet contents in a plan document set. As you think through the sheets needed, attention will be focused on the plot scale of drawings, sheets needed to show all cross sections, etc. As earlier stated, design document preparation time can be associated to the effort involved in preparing each sheet needed in the plan set.
- At this step the various disciplines needed to produce the design project, the discipline sub-type files, i.e., Electrical discipline and Power Plan, and all associated model design files that will be needed should be determined. A suggested method is to identify the various sheets in each discipline and that should focus on the design models that will be referenced to the sheet files. Each design model file will be developed as individual design files.

**Step 7. Create Design Files**

- From the list of design models defined, create a new design file for each model file needed.
  - In the Project Wise environment, create and name all new dgn files.
  - Log-in to CadConform and Brand each file to the correct model or sheet type. This process should be done for each discipline in the Project Wise project area. Each discipline will have there discipline listed under the project title.
- Create the model design files assigning the appropriate model type. For example, the electrical discipline's member(s) will develop the design models for the electrical site plan, power plan, detail designs, schedules, lighting plan, etc.

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- The standard workspace configuration in Project Wise has preset configuration definitions for each seed files that match each disciplines requirements. *See the Jacksonville District Workspace description in Appendix B.*
  - Model seed files for all disciplines use 3D seed files.
- Create the new sheet files that will contain the referenced models.
  - The standard workspace set up in Project Wise has preset configurations for each seed files that match each disciplines requirements.
    - Vertical designs such as Architectural and Structural use are configured to use the vertical seed DGN which are 2D seed files.
    - Horizontal design such as Civil and Geotechnical use horizontal seed file which are 3D seed files.

#### **Step 7. Prepare Sheet files (Build sheet composite files)**

- The step includes the reference of the border and design model files (plan, detail, elevation, section) to sheet files.
- Referenced imagery (photography) requires the adherence to Raster Reference Procedures.
  - See the Reference File Procedure Workflow for details.

#### **Step 8. Drawing Design Presentation and Layout**

- Drawing preparation presentation is described in the **Drawing Presentation Checklist**. This includes technical aspects such as scale choice, text heights, layout, and presentation quality standards and format requirements.

#### **Step 9. Project Compliance Checking**

- The design team-lead and members must schedule and perform project standards compliance checks which are due at each quality review milestone. See the **CADconform File Checking** workflow in Appendix A.
  - Prepare the standard compliance reports using CadConform®.
  - Make corrections required for compliance.
  - Produce compliance reports to submit during quality review.
- Submit written justification for compliance deviations with report.

#### **Step 10. Plotting**

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- Procedures for Microstation® Batch Plotting and IPLOT Batch Plotting including the, PDF Contract Document Set. See the **Plotting with Microstation and IPLOT** workflow for details.

**Step 11. Contract Document PDF Preparation**

- Perform project design File Clean up procedures.
  - Eliminate all graphics existing outside of Sheet borders of boundaries of Model files. This provides a professional appearance for others, such as the construction contractor, who later will receive the design files from which to prepare the as-constructed files.
- Use the printing methods referred to in **Step 10**, plot the contract set to a single PDF file named for the project for advertisement.

**Step 12. Supplemental Drawings**

- Follow prescribed amendment and modification procedures:
  - Minor revisions to construction documents do not normally entail replacement of existing design documents.
  - Major revisions normally require superseding of the original drawings and introduction of revised “sheets”.
    - This would require creating a copy of the original drawing to a superseded folder in Project Wise.
    - The original designs would then be revised to meet the needed changes for the design contract amendment or modification.
    - Files/folders in Project Wise should be labeled in such a way as to identify the amendment or modification number.
    - In addition, the Admin team will change permissions for the superseded folders/files so that no changes can be made.

**Step 13. Project Close Out**

- Achieve Project “As Constructed Design Files” and ASBUILTS in Project Wise.
  - As constructed design files will be archived in the Project Wise project folder area.
  - As-built files will be archived in the Project Wise As-Built Folder area.
    - A new folder will be created for each as-built document set to be archived.

## Appendix A-2

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### Project Wise Workspace

#### **Description:**

Project Wise® is the required engineering document management system for all project development. Users are also required to comply with the A/E/C CADD Standards in the preparation of project design files. Project Wise® has the functionality to set configurations and automate many process steps making the production of the design documents much faster with less preparation and decision making on the part of the project team member. This setting of configuration variables to automate workflows is known as a workspace. The Jacksonville District Design Branch has developed a workspace that provides this automated process. It has been developed within the Project Wise® Admin environment using the proprietary Project Wise® paths and variables. The process is described in detail below.

#### **Workspace definitions:**

**Variables:** Variables are named terms that are predefined to perform particular functions in Microstation® environments. For example MS\_CELLLIST is a standard variable that the user, or a workspace can define as needed. See the variable definition below.

**Values:** Actions or commands that are assigned to variables. If the variable 'MS\_CELLLIST' the cell path is set to a value of 'x:\project\dgn\\*. \* ' then each time the user request to open a cell library, Microstation will search or show a list of libraries in the x:\project\dgn\ directory.

**Workspace:** A collection of variables and associated values, macros and defined paths that automate many design functions for the user and standardize workflows and processes.

**Workspace Configuration Blocks:** Workspace variables assigned through Project Wise® and saved as a named group of variables to attach to a Project Wise folder.

**Macro:** A command or set of commands that performs complex functions but automates the functions by invoking the commands through a single key stroke, like a function key, or perhaps may be imbedded in some other function.

**Standard Directories Project Wise:** Folders and subfolders that have been predefined to establish a base for project folder set up routines.

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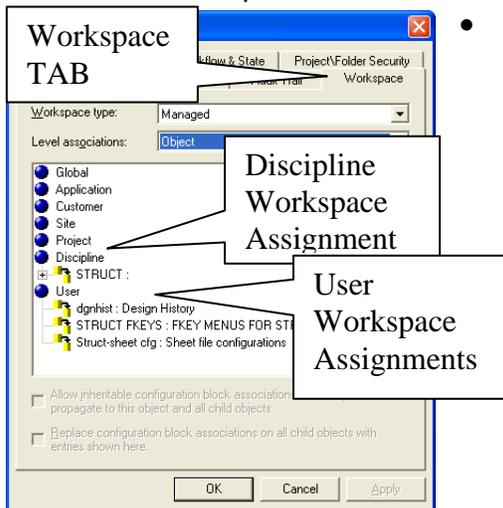
### Project Wise Workspace

**Workspace Properties:** The assignment of groups of variables, macros, and automated functions to a particular set of discipline folders in the project directory.

**Workspace Folder Assignment:** The assignment of a discipline's workspace properties to a folder or group of folders to achieve the workspace process goals.

**1. A workspace is an organized system that automates many of the design processes used in project design development.**

- The Jacksonville District Design Branch has established such a workspace for its users for project execution of designs. This is accomplished through the utilization of a standardized Project Wise Folder organization. Specific Workspace discipline definitions are attached or assigned to a folder.
  - Any design file created or opened from a workspace folder will be subject to the workspaces discipline functionality. For example, a project that has a folder named Structures and a subfolder named Models will have two different sets of workspace assignments made. First, the Structures folder will have the Structural discipline's sheet file settings assigned.
- **Sheet file workspace assignments initiate variables that call a 2D seed file if creating a new file**, Sheet file Levels that will show up in the level manager of that design file if created or if an existing file residing in that folder is opened by the user.
- **The Models folder assign variables that calls all of the levels for the Structural discipline**, set a 3D seed file from which to create model design files. There are other named folders such as the Working folder or Inroads folder. In these cases they are both considered folder that contain Model type design files and therefore would have the model type workspace assignments made. Examples of how the Project Wise properties dialog is shown below.



- **The Project folder properties dialog on the left has the Workspace Tab selected.**

Notice the Discipline and User items. The Discipline item has a configuration block that Sets a number of variables such as attaching the text and dimension DGN Libraries or Dgnlibs that provide those styles for the user.

- Other variables include levels, line styles, cell library paths, and seed file assignments, line styles, etc. The User configuration blocks provide items such as starting design file history, assignment of a function key menu with macros included for automated functions.

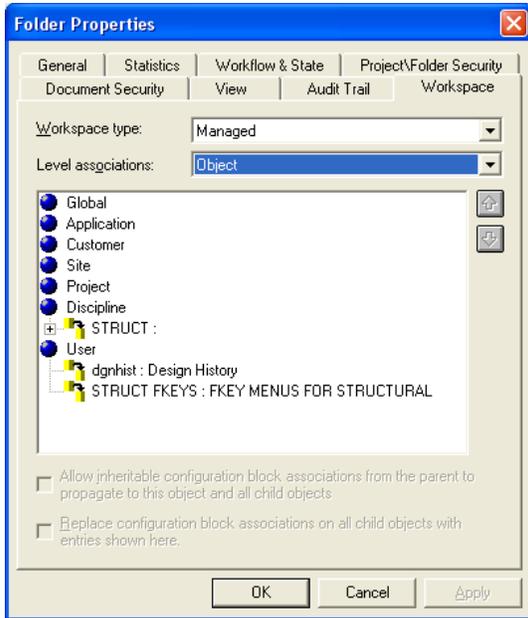
function key menu with macros included for automated functions.

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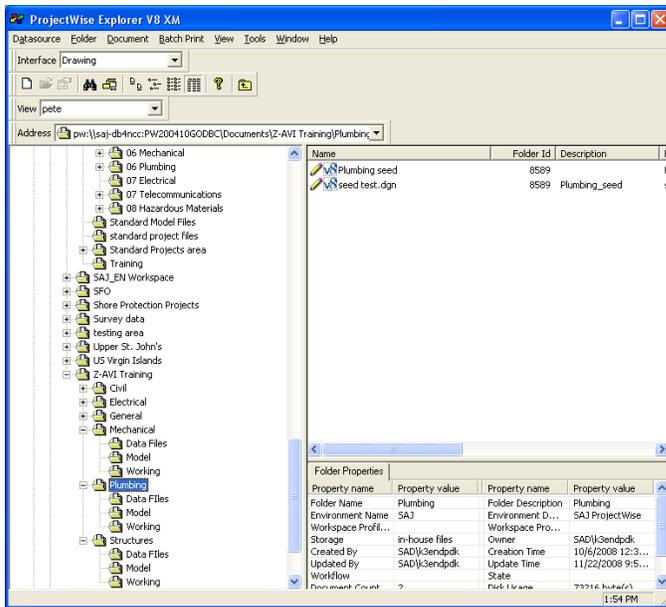
### Project Wise Workspace

○ The structural sheet file configuration block is also assigned because the particular folder selected is the structures folder which is the folder designated for sheet files. If the folder was the InRoads, Models, or Working folder the Structures sheet file configuration block would not be assigned to the user workspace item. The properties dialog below shows the workspace as it is assigned to the Models folder.



structures discipline.

○ This is the Model folder properties dialog. Notice that the assignments are the same with the exception that the Structures Sheet configuration block is not assigned to this folder. All other configuration blocks are the same as the sheet file folder. All Structures discipline model type levels will be shown in any design file opened or created from this folder. The standard dimension and text styles will be provided as well as the standard line types, cell library paths, and model seed file for the

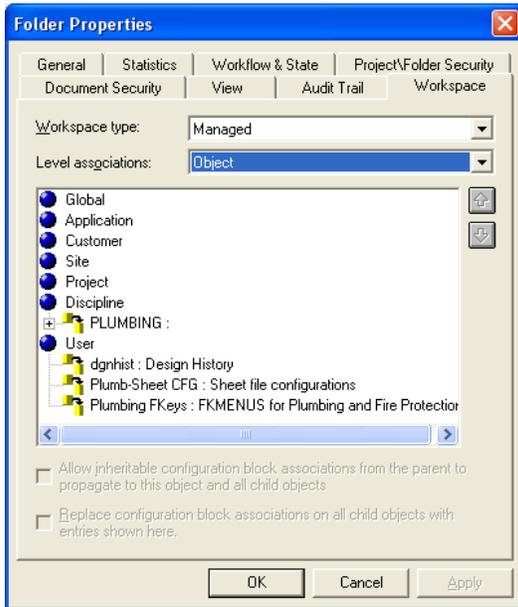


The Project Wise® Dialog to the left show the Plumbing Sheet file folder highlighted and the Properties dialog for that folder is shown below. Notice the various configuration blocks which are assigned. Remember this folder is named Plumbing so it is a Sheet file folder and therefore the workspace set up a sheet file configuration.

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### Project Wise Workspace



- The workspace is configured in a like manor for each folder in each project differing only with disciplines. The team members should understand that the workspace can only be effective if the workspace is assigned by the Admin Team and that each folder is managed in such a way to separate sheet file folders from model type folders as shown in the examples above.

## 2. Existing Project Workspace Assignments

Design project leaders should contact the CADD Coordinator to have the workspace assignment made to the current projects that are under design. Some file maintenance may be required. For example, if sheet files and model files are mixed in the same folder, the workspace will not work properly. The sheet files must be segregated by discipline residing in a folder designated specifically for that disciplines sheet files.

## 3. New Project Workspace Assignments

Design project leaders beginning design on new projects should contact the CADD Coordinator to create the project folder and subfolder with the workspace assignments already created. This will be a very simple process that will only take a few minutes.

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**Project Wise Document Management System (PWDMS)**

Project Wise is the mandated document management system for management and control of engineering records or files.

**Definitions:**

**Records:** Engineering documents prepared to accomplish repair, maintenance, or construction of project features included in these documents are the planning, design analysis, plans and specifications, engineering documentation, and archival documents.

**Administrator(s):** Project Wise administrators who manage and support the project design teams in the development of projects.

**Folders:** Project Wise File folders in which specific types of documents are filed.

**Model Type:** The discrimination within a discipline of design categories. For example Civil Site work or Civil Navigation work.

**Sheet Files:** A DGN file type that is a “container” for a border/titleblock file, design models files. Dimensioning, notes and other annotations are placed in the sheet files rather than the model files.

**Model Files:** A DGN file type that contains the graphic design that will be referenced to the sheet file.

**Workspace:** Project Wise configurations preset to Project Folders that control the assignment of Microstation actions and variables set to each discipline and discipline model type.

**DGNLIB:** A DGN file that contains various settings such as levels for a particular discipline, dimension style settings, or text style settings. When applied in the workspace, these settings populate the active design file with the DGNLIB settings. SAJ uses a different DGNLIB for each discipline and a separate DGNLIB in each discipline for model files and sheet files.

**Model Type:** The discrimination within a discipline of design categories. For example Civil Site work or Civil Navigation work.

**Commencing Project Design Preparation**

The Project Engineer assigned to the Project will contact the Project Wise Administrator to request the creation of the project folders needed to prepare the project including all disciplines involved in the project team. The request should include the following information.

1. Project Name
2. Project P2 number
3. Discipline included
4. List of team members (for assignment of folder/file access)
5. Design sheet size to be used (ANSI D or ANSI E)
6. Special Requests for menu items or additions to workspace configurations.

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### Folder Naming Conventions

1. Administrators normally setup the initial Folders when creating the project for the project lead or PE. The team leaders do have permissions to create folders, however some guidelines are necessary in the naming convention. See the guidelines shown below. These folders will be setup by the PWDMS administrator.
  - **<Project Name>** (project parent folder)
    - **<Discipline Name>** (a folder for each discipline)
      - **Data Files** (non-design files)
      - **Model Files** (design model files)
      - **InRoads** (only in civil, geotechnical, and survey disciplines)
      - **Working Files** (general development files not included in the final design documents)
2. The specific names of the folders are not as important as the controlled content of the files in the folders. In other words sheet files and model files cannot reside in the same folder. Discipline-named folders must contain sheet files only, and the Model Files folders must contain model files only.
3. Files in the Model Files folder should be segregated into model types as described below in the **Project Documents** paragraph 1.b.
4. The Corps of Engineers Project Wise Administration Team is currently developing a Project-Wise Collaboration Model (PCM) that will require a more defined system to be implemented at a future date, as yet unknown.

### Project Documents

Project Documents include but are not limited to:

1. Project design files including:
  - Sheet files
    - Cover sheets
    - Index sheets listing all design documents in the plan set.
    - Individual sheet files containing annotation text, scales, sheet title, coordinate tick marks and labels, and north arrow. (Sheet files reference design model files, border/title block files, and imagery to the sheet file.)
  - Model files:
    - Each discipline includes definitions for various categories or **model types**, for example the electrical discipline contains the following **model types**:
      1. Lighting Plan
      2. Power Plan

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3. Special Systems Plan
  4. Grounding Systems Plan
  5. Electrical Utilities Plan
  6. Exterior Communications Systems Plan
  7. Airfield Lighting Plan
  8. Details
  9. Riser One-line Diagrams
- Each discipline contains its own list of model types. The AEC CADD Standard Appendix A contains the model type definitions for all disciplines.
  - Each folder is assigned either **sheet file** or **model file** workspace properties attributes according to discipline.
  - The PWDMS workspace properties attributes are a listing of Microstation/Project Wise configuration variables that assign file resources and file path definitions to project resource folders. If the workspace assignment is made to the electrical discipline sheet file folder example above in paragraph 1.a. The configuration variables would assign a 2D seed file, standard text styles, dimension styles, line styles, and electrical sheet file levels with graphic attribute assignments. If the folder was the **Model Files** folder as shown in paragraph 1.b., the assigned workspace would set a 3D model seed assignment, attach the text and dimension styles library file, attach all of the electrical disciplines levels with graphic attribute assignments.
  - Folder discrimination must be made between sheet and model files in each discipline for the PWDMS workspace to be effective.
2. Images used to add visual orientation to project design file presentations. The General discipline folder contains an **Imagery** folder to contain all images for the project.
    - Images are more commonly aerial photos of project sites
    - Site visit photos
    - Scanned images of previous designs for informational purposes
  3. PDF files of project design files used for construction contract advertisement.
  4. InRoads development model, (InRoads models), files. These files are special files used to produce geographic earth models for project development.

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Project Reports used in evaluating, analyzing, or documenting the project design. (see the list of report file type described in the **Archiving**

**Engineering Project Documents** paragraph 2 below).

5. Specifications and government cost estimates (special security considerations are applied to cost estimates).
  - Specifications and government cost estimates are archived in the project folder after the project is completed. There is not associative provisions in Project Wise to accommodate the development of the Specifications and Cost estimating programs.

**Archiving Engineering Project Documents**

1. In addition to in-house design files, other organization's project files that must be managed and controlled by the PWDMS include:
  - Partnering Organization Project Documents
    - State agencies
    - AE submittals
    - Corps District design partners
2. Types of documents that are included as archival documents are:
  - Amendments and Modification documents
    - Shop drawings
    - Amended design files
  - Construction Documents:
    - RFI communications
    - EDC documents
    - As-Built documents
  - Other archive documents include:
    - Specifications
    - Engineering Design Analysis
    - Design Documentation Reports
    - Detailed Design Reports (DDRs)
    - General Reevaluation Reports (GRRs)
    - Cost Estimates

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Index Sheet Information from Project Wise

**Capturing metadata from Project Wise for import to an Excel Spreadsheet**

1. Highlight the desired design file data you would like imported to spreadsheet i.e. <ctrl>+a to select an entire discipline of sheet files
2. Right click in the highlighted area and select Copy List To → Clipboard Tab Separated
3. Paste into an open Excel spreadsheet.
4. Edit exported text as desired to fit the format for the Index to Drawings.

## Step 1 Preliminary preparation for design project workflow.

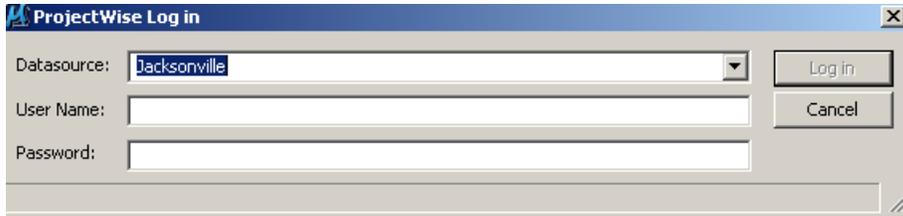
- **Select Resources from the Project Wise Saj EN Workspace to prepare for drawing development.** There are various resources available for the user. These include, Standard Seed files, Cell Libraries, Borders and Companion files, Inroads INI files (Inroads Preferences and Geometry Styles). It is important to move all the needed resources to your project within in Project Wise. This will require advance planning to determine the kinds of design files, which will be created in the project workflow.
- **CAD Conform and the AEC Standard.** Cadconform maintains a connection to the AEC CADD Standard. The Cad Conform application is a dual purpose product, (a) it manages the Standard, and (b) it is a drafting/design tool for the user enabling compliance with the standards while generating the project design elements through selection of menu options and placing design elements in the project design file.
- **Model Files Types and File Names.** There are a few rules to follow in using CADconform and working within the AEC CADD Standard Framework.
  - Model type files are DGN files that focus specific elements of the project. For example, a set of civil works channel cross sections are required to be in a DGN file containing only cross sections. This is true in all disciplines. CAD Conform is configured in such a way that only menus containing items pertaining to the specific model type you have chosen are available. These files will be referenced to sheet files as well as the border/title block to complete the drawing set.
  - **CADconform does not control the file naming convention.** The file naming procedure is defined in the AEC CAD Standards. Corps team members whether in-house District members, AE firms, or Brokering Districts must use this naming format for model and sheet files.

**Step 2. Executing the Cad Conform Program.** On your desktop you should initiate starting a drawing by initializing the Icon titled CAD Microstation XM. You should see Microstation XM start.

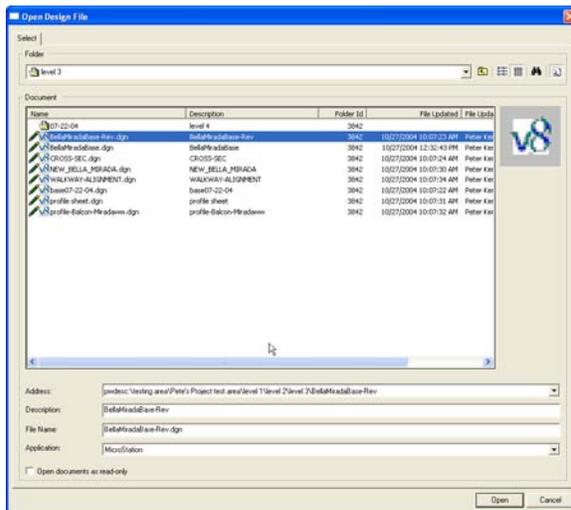
- Once Microstation starts, the Project Wise Login Dialog should appear. It is important that you login to this dialog. If you are in the Project Wise

## Appendix A-5 Plans Preparation Manual CadConform Drafting

Explorer and browse to a DGN file in your project and double click to open the file.



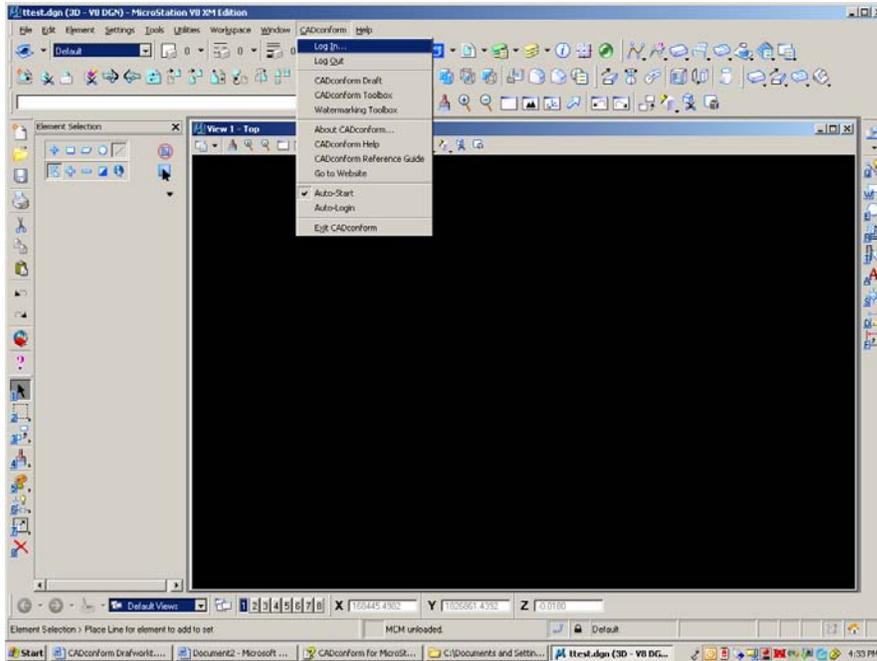
### Login to Project Wise



- **Project Wise and Open File Dialog.** When the Project Wise Login is successful, you will be prompted to open a file (DGN) the dialog presented will be a Project Wise open file dialog. Select the project, and file you wish to checkout and edit.
- After the file opens select CADconform login.

- In the CADconform Server Login Dialogue enter the user login and password Select Data Source type of discipline.
  - The user name field will require to you to type the discipline name to which your design work is defined. This requires the discipline name to be typed in lowercase with no abbreviations. For example, civil, electrical, structural, mechanical, or architectural.
  - Pass word for all disciplines is "saj".
  - When the discipline is entered the dialog will show the discipline in the Data Source field at the bottom of the login dialog.
- The discipline log-in will then open a drafting menu only if the file opened was created and previously branded by CADconform as that discipline and model type. If not previously branded to discipline and model you will be prompted to do so before a CADconform draft menu/icon dialog will be displayed.

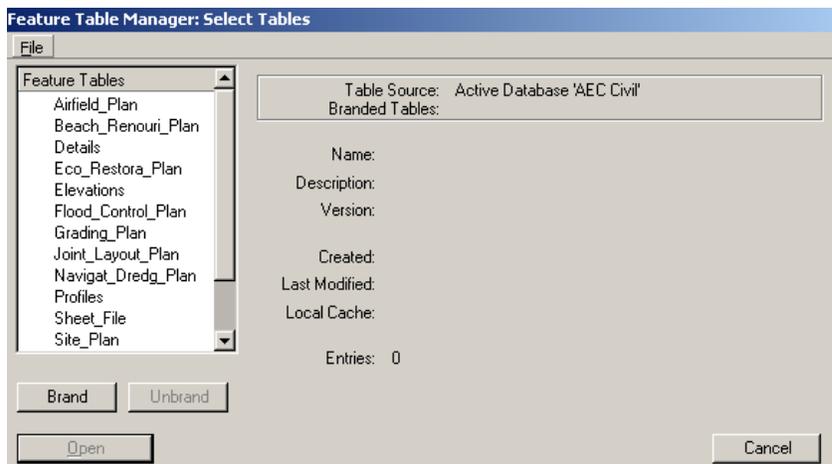
## Appendix A-5 Plans Preparation Manual CadConform Drafting

A dialog box titled 'CADconform Server Login'. It contains the following fields and controls:

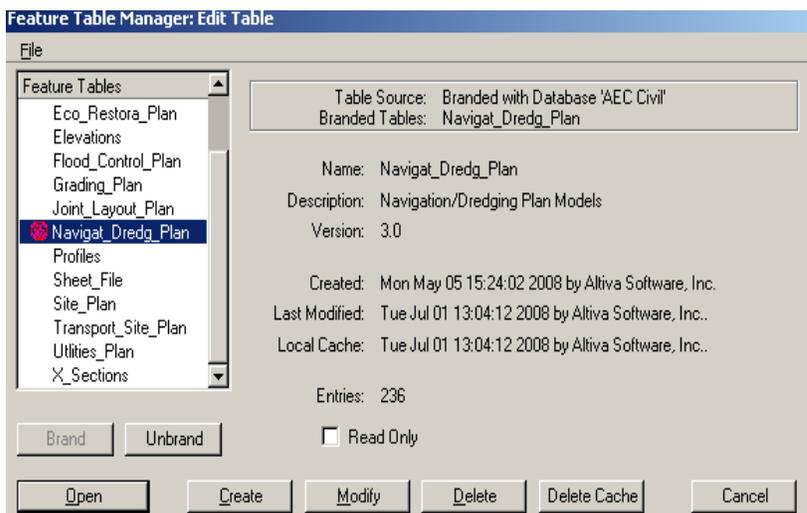
- Licensed to: CMLicense Server
- User Login: [text input field]
- Password: [text input field]
- Remember My Password (with a key icon)
- Data Source: AEC Civil (dropdown menu)
- Buttons: Login, Logout, Configure, Cancel

- If the file has not been previously defined in CADconform by branding the discipline/model type, the Feature Table Manager dialog will display with a listing of the available model types.
- In the Feature Table Manager select the type of file sheet/model file, i.e. sheet\_file brings up civil sheet file. After the type of file is selected click brand and then open, this will then brand the file type.

## Appendix A-5 Plans Preparation Manual CadConform Drafting



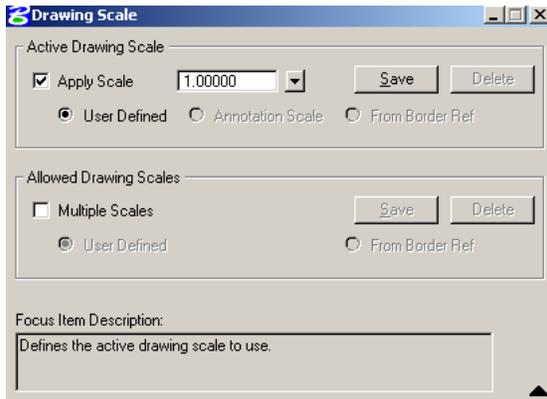
- **Step\_4.** Set Up the Drawing Scale. The Drawing Scale dialog allows the user to define the active scale of the current design file / model. The Drawing Scale allows the user to define text sizes only once in a text feature, and then apply a different drawing scale to get various text scales. The Drawing Scale is effectively a global scale multiplier, so it can only really be used if a uniform scale multiplier can be applied to text features in the context of one design file / model.



**Set the Drawing Scale.** The drawing scale can be set manually and is only applied when the “Apply Scale” toggle is ON. Otherwise a value of “1.00” will be implied.

The drawing scale can be automatically set for each design file by one of the following two methods:

## Appendix A-5 Plans Preparation Manual CadConform Drafting



1 - Reading the Drawing Scale last saved to the Design File by CADconform. This element contains the drawing scale last saved, and is read whenever a new drawing is opened or CADconform is activated.

2 - Reading the reference attachment scale from a standard border sheet. This is achieved by CADconform comparing all current reference files to a predefined list of standard border sheets. If a match is found, then the reference attachment scale for this model is read and the Drawing Scale is set to this value. If both 1 and 2 are set, then 1 will take precedent, which allows the user to override the interpreted Drawing Scale for particular drawings where the scale needs to be overridden. If neither method 1 or 2 are set, then the drawing scale dialog box will automatically open to allow the user to specify the drawing scale. The radio buttons below the scale options will show which method was used to read the active scale.

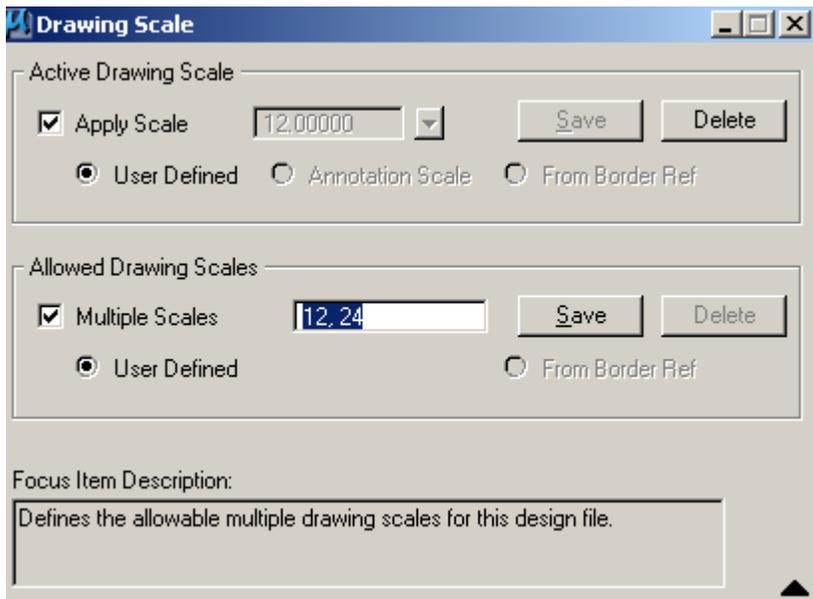
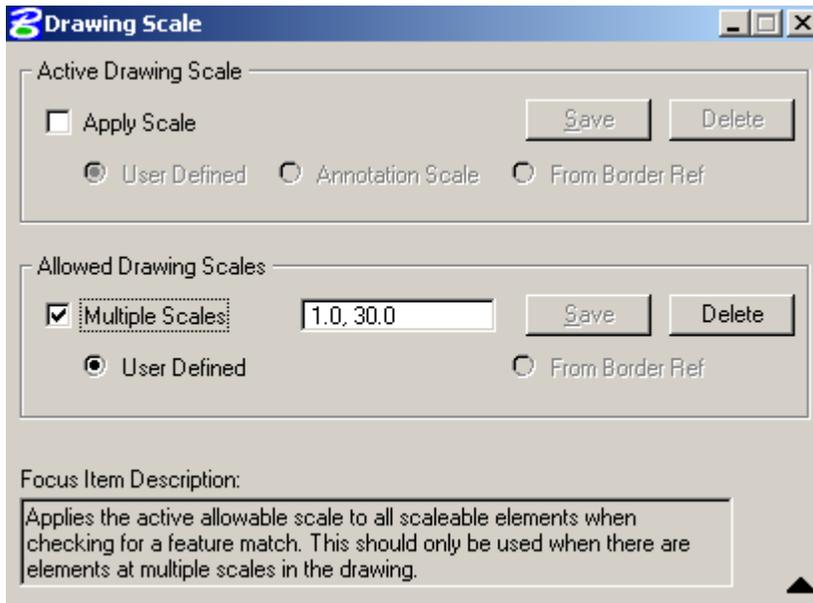
The Save and Delete buttons will only be enabled if the scale method is set to "User Defined". If a saved scale already exists for the active design / model, then the Save button will be disabled and the Delete button will be enabled. Similarly, the Delete button will be disabled and the Save button enabled if no scale is currently saved. If there are no standard borders defined or attached to the current design file / model, then the "From Border Ref" radio-button will be disabled.

### Multiple Scales

If more than one scale is defined in one design file or model, then each scale can be defined in the "Multiple Scales" definition of the Drawing Scale dialog box, separated by commas. If this option is not visible, then press the down arrow icon on the bottom right of the dialog box to expand the window. The multiple scales can also be saved to the design file, or read from standard border sheets.

Defining multiple scales effectively means all features in the design file can be interpreted at any of the multiple scales defined. This can create ambiguity if only specific areas of the drawing are at different scales. If this is the case, then it is better to disable multiple scales, restrict Conform or the Report Generator to those areas individually using a fence, and run the tool at the one specific scale for that area.

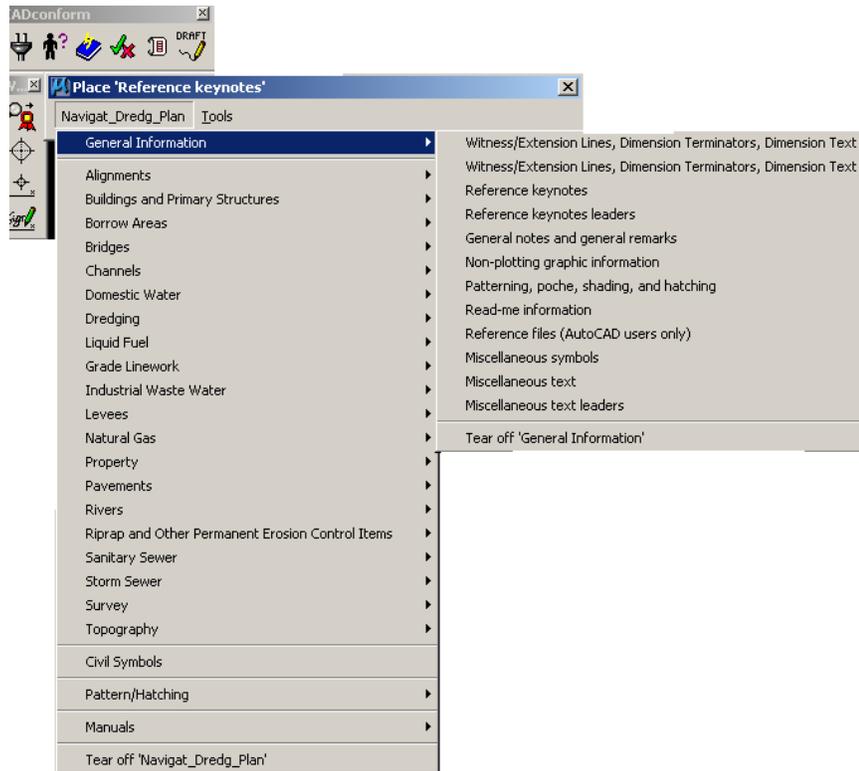
## Appendix A-5 Plans Preparation Manual CadConform Drafting



### Step 5. Using CADconform Drafting Menu

- Selecting the model type provides a pull down of five selections

## Appendix A-5 Plans Preparation Manual CadConform Drafting

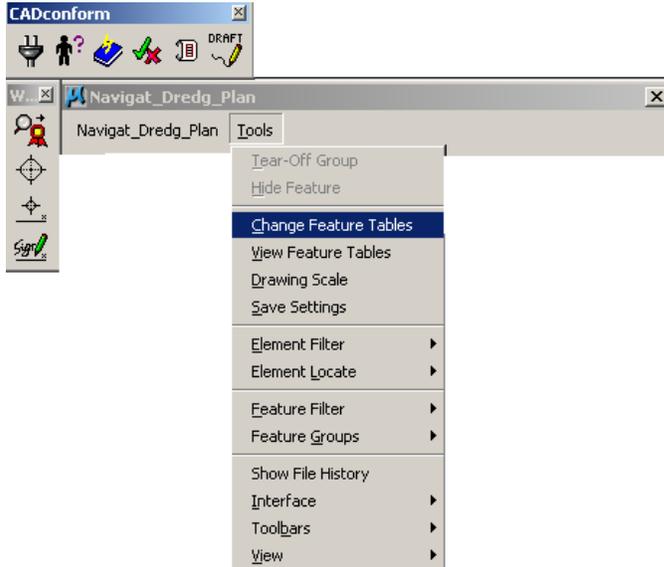


- From the Drafting category group menu, select the menu group and the item you wish to select for you drafting task. For example, General Information opens a list of types of text and symbols. The selection calls a Microstation command to place every feature. If you select General Notes for the menu shown above, a place text command will be started.
- Cell or Symbols. The lower portion of the drafting menu in the example shown above shows the Civil Symbols. If this item is selected an active cell library dialog. The type of cell then needs to be attached through the Microstation place cells workflow.
- Patterning/Hatching. Pulls up pattern/hatching to select for attachment to the model file.
- Manuals. Link to the AEC CADD Standard
- Tear Off. The tear off command allows the drafting menu to tear off to show the model type drafting menu separately. It displays four icons locate tools, turn off filter, set drawing scale, save, expand tool bar (show cell, show linear, show text, and show dimension, clear filter, and shrink tool bar)

## Appendix A-5 Plans Preparation Manual CadConform Drafting



- The selection of tools allows twelve tools to be accessible.



- Change Feature tables. This command allows the file to be branded to a different model feature.
- View Feature Tables. Views the feature table model branded to and the version of the feature.
- Drawing Scale. Drawing scale allows the user to reset the scale of the model file.
- Save Settings. Saves current setting of CadConform.

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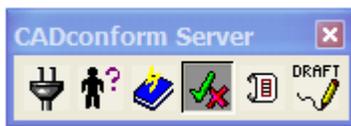
## Plans Preparation Manual

### CADConform File Checking

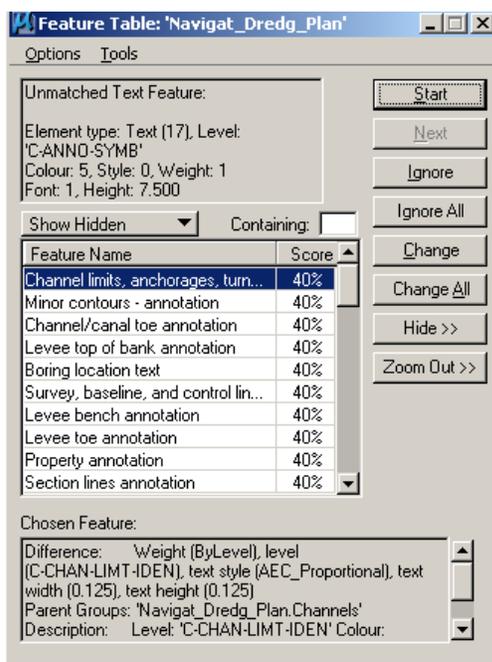
**Step 1. Select Feature Table.** Before a report can be generated, the Feature Table must be chosen. The chosen Feature Tables define which features are allowed for each design file in the report. Once the Feature Tables are chosen and imported using the Feature Table Manager, the Report Generator dialog box will open.

**Step 2. Run the Conform tool.** (Begin the standards checking process)

Select the Checker Icon for the Conform tool bar.



**Step 3. Start the Conform Summary.**



- Select Start. CADconform begins scanning the design file. The dialog will indicate the Feature Table to which the file is branded. When Conform has finished scanning the current design file, a summary of the number of conformed features is displayed, as well as the number of features ignored or added
- Finding Unmatched Elements. The Conform dialog, after finding an unmatched element provides a suggested replacement.
  - The dialog will display the unmatched element at the top of the checker dialog.
  - The center section displays a votive list of possible symbology that may be

correct. If one of the suggested items are chosen,

- Note that the unmatched element is highlighted in the design file. The element will, by default, blink to indicate the error.
- The lower section of the dialog indicated the difference in the unmatched element and the selected element.
- Select *Change* or *Change All* to conform the selected element.

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### Plans Preparation Manual

### CADConform File Checking

- **Next:** Next finds the next invalid element once an element is corrected.
- **Ignore:** Ignores the current invalid element and continues scanning.
- **Ignore All:** Ignores all instances of this unmatched feature until the end of the design file.
- **Change:** Changes the symbology of the unmatched feature to match the symbology of the selected feature in the Feature Table.
- **Change All** Changes all features in the design file that match the current unknown feature, to match the symbology of the selected feature in the feature table. Conform will then report how many changes were made to the design file, and then allow the scan to continue from where it left off. Change All will change all elements that match the offending element an only elements that match that element error.

When all elements are changed to conform to standard symbology in the file, the dialog will show blank as before the checking process started. When Start is selected again, any unmatched elements will again be shown. If some unmatched elements remain for reasons specific to project demands, such as, presentation quality demands, or no element was available for the design need, or some other approved reason. It is required to provide a notation made to supplement the Quality report submitted at Project Quality Review time.

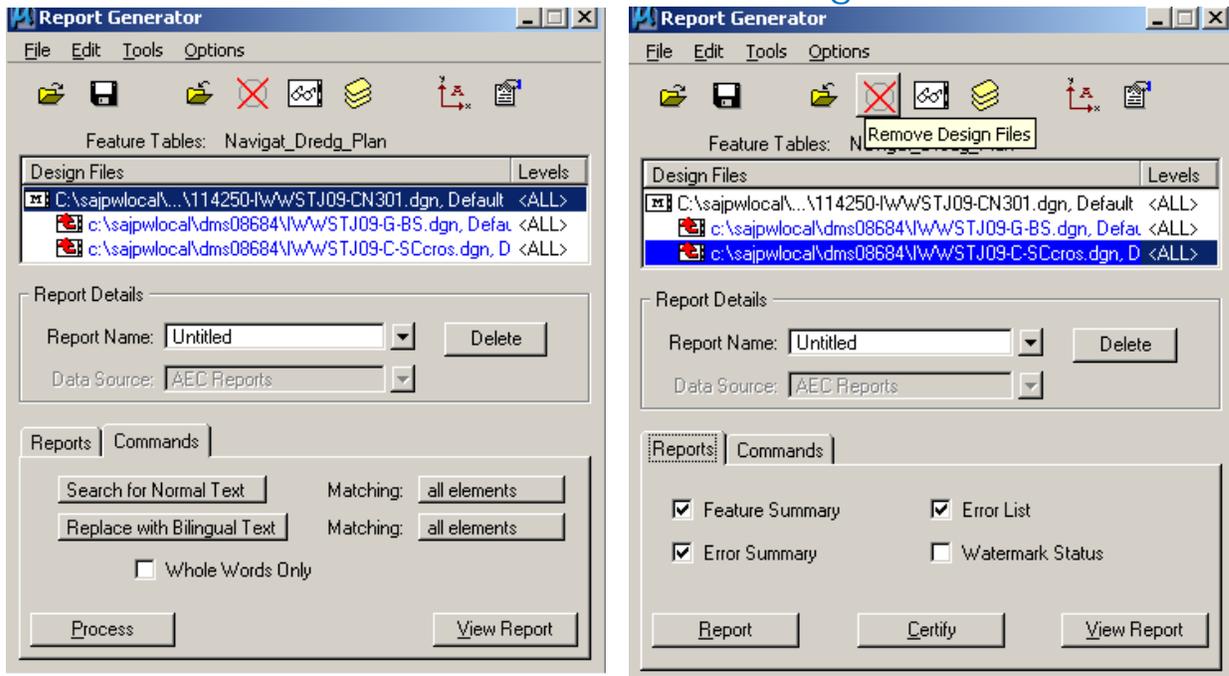
**Step 4. Run the Report Generator** . The Report Generator is used to create reports on a list of design files that do or do not match any of the features in the chosen Feature Tables.

The Feature Tables must be chosen before a report can be generated. The chosen Feature Tables define which features are allowed for each design file in the report. Once the Feature Tables are chosen and imported using the Feature Table Manager, the Report Generator dialog box will open.

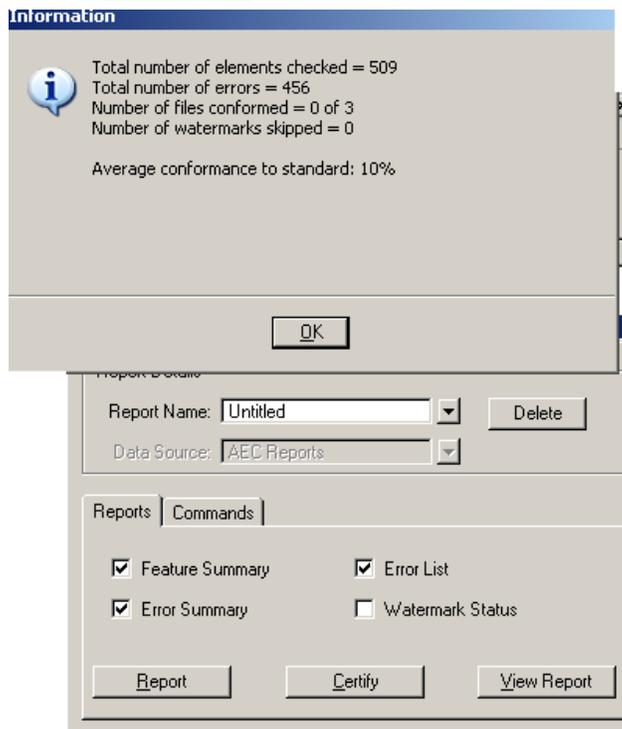
## Appendix A-6

### Plans Preparation Manual

### CADConform File Checking



- **Select Report.** The report then processes the file and provides information as to the number of elements checked, number of errors, number of files conformed.
- **Select Ok.**



An information block is shown as indicated above and provides the number of elements checked, errors and files conformed

Design Files List Box Displays the chosen design files to generate the report on. This list can be edited by clicking the "Add / Remove" button. Master design files are displayed in black text; referenced design files are displayed in blue, and

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## Plans Preparation Manual

### CADConform File Checking

missing reference files are displayed in red. Reference files are indented once for each level of nesting.

Report Number	User Name	Action	Action Date	Scan Type	Num Passed	Num Errors
1		Created	Wed Jan 28 13:01:13 2009	Cells, Linear, Shapes, Text & Dimensions	53	456

### A Design File Summary Table

Design File	MSLevel	Master Unit	Sub Unit	MU Name	SU Name	Origin X	Origin Y	Origin Z	Ref. Scal	Drawing Scal	Feature Data	Feature Table	Num Passed	Num Errors
...\\114250...	<ALL>	1	1000	ft	th	-2147483...	-2147483...	0.0	1.000	120.0, 192...	AEC Civil	Navigat_Dr...	21	40
...\\w\\w\\STJ...	<ALL>	3	1000	'	th	0.0	0.0	0.0	50.000	1.000	AEC Civil	Navigat_Dr...	0	147
...\\w\\w\\STJ...	<ALL>	1	1000	ft	th	-2147483...	-2147483...	0.0	1.000	1.000	AEC Civil	Navigat_Dr...	32	269

The Design File Summary table below shows the symbology, coordinates and file position of every element that did not match any features in the Feature Tables. Note that this report can be very time consuming to produce in files with many errors.

Design File	Symbology	XCoord	YCoord	FilePos
C:\sapjwlocal\dms09336\114250-Iv\\w\\STJ09-CN301.dgn, Default	Text: lv='C-ANNO-SYMB' co=5 ft=1 th=0.039 wt=1	365949.868	1445192.965	400...
C:\sapjwlocal\dms09336\114250-Iv\\w\\STJ09-CN301.dgn, Default	Text: lv='C-ANNO-SYMB' co=5 ft=1 th=0.039 wt=1	365949.868	1445155.602	400...
C:\sapjwlocal\dms09336\114250-Iv\\w\\STJ09-CN301.dgn, Default	Text: lv='C-ANNO-SYMB' co=5 ft=1 th=0.039 wt=1	365856.198	1445182.587	400...
C:\sapjwlocal\dms09336\114250-Iv\\w\\STJ09-CN301.dgn, Default	Text: lv='C-ANNO-SYMB' co=5 ft=1 th=0.039 wt=1	365856.728	1445145.441	400...
C:\sapjwlocal\dms09336\114250-Iv\\w\\STJ09-CN301.dgn, Default	Text: lv='C-ANNO-SYMB' co=5 ft=1 th=0.039 wt=2	365928.57	1445232.718	400...
C:\sapjwlocal\dms09336\114250-Iv\\w\\STJ09-CN301.dgn, Default	Text: lv='C-ANNO-SYMB' co=5 ft=1 th=0.039 wt=1	365896.502	1445155.602	400...
C:\sapjwlocal\dms09336\114250-Iv\\w\\STJ09-CN301.dgn, Default	Text: lv='C-ANNO-SYMB' co=5 ft=1 th=0.039 wt=1	365996.563	1445155.602	400...
C:\sapjwlocal\dms09336\114250-Iv\\w\\STJ09-CN301.dgn, Default	Text: lv='C-ANNO-SYMB' co=5 ft=1 th=0.039 wt=1	365892.782	1445192.965	400...
C:\sapjwlocal\dms09336\114250-Iv\\w\\STJ09-CN301.dgn, Default	Text: lv='C-ANNO-SYMB' co=5 ft=1 th=0.039 wt=1	365993.967	1445192.965	400...
C:\sapjwlocal\dms09336\114250-Iv\\w\\STJ09-CN301.dgn, Default	Text: lv='C-ANNO-SYMB' co=5 ft=1 th=0.039 wt=1	366045.027	1445155.602	400...
C:\sapjwlocal\dms09336\114250-Iv\\w\\STJ09-CN301.dgn, Default	Text: lv='C-ANNO-SYMB' co=5 ft=1 th=0.039 wt=1	366043.021	1445192.965	400...
C:\sapjwlocal\dms09336\114250-Iv\\w\\STJ09-CN301.dgn, Default	...\\lv='G-ANNO-TEXT-DRWG' co=ByLevel style='????????'.DGN [...	366278.907	1445547.422	400...
C:\sapjwlocal\dms09336\114250-Iv\\w\\STJ09-CN301.dgn, Default	...\\lv='G-ANNO-TEXT-DRWG' co=ByLevel style='Sheet identificati...	366198.913	1445110.744	400...
C:\sapjwlocal\dms09336\114250-Iv\\w\\STJ09-CN301.dgn, Default	...\\lv='G-ANNO-TEXT-DRWG' co=ByLevel style='????????'.DGN [...	366202.445	1445727.768	400...
C:\sapjwlocal\dms09336\114250-Iv\\w\\STJ09-CN301.dgn, Default	...\\lv='G-ANNO-TEXT-DRWG' co=ByLevel style='????????'.DGN [...	366230.126	1445726.885	400...
C:\sapjwlocal\dms09336\114250-Iv\\w\\STJ09-CN301.dgn, Default	...\\lv='G-ANNO-TEXT-DRWG' co=ByLevel style='????????'.DGN [...	366201.549	1445810.402	400...
C:\sapjwlocal\dms09336\114250-Iv\\w\\STJ09-CN301.dgn, Default	...\\lv='C-ANNO-NOTE' co=ByLevel style='Border #125' ft=3 th=0.0...	365782.212	1445362.508	400...

**Error Summary.** Produces a summary of each error in the design file and how many times it occurred. This optional report contains one row for every error in a design file. The same error may appear multiple times.

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## Plans Preparation Manual

### CADConform File Checking

Design_File	Symbology	Num_Errors
C:\sapwlocal\dms09336\114250-IvW\STJ09-CN301.dgn, Default	Text: Iv='C-ANNO-SYMB' co=5 ft=1 th=0.039 wt=1	10
C:\sapwlocal\dms09336\114250-IvW\STJ09-CN301.dgn, Default	Text: Iv='C-ANNO-SYMB' co=5 ft=1 th=0.039 wt=2	1
C:\sapwlocal\dms09336\114250-IvW\STJ09-CN301.dgn, Default	... \ Iv='G-ANNO-TEXT-DRWG' co=ByLevel style='????????'.DGN (user definable ...	4
C:\sapwlocal\dms09336\114250-IvW\STJ09-CN301.dgn, Default	... \ Iv='G-ANNO-TEXT-DRWG' co=ByLevel style='Sheet identification numbers' th...	1
C:\sapwlocal\dms09336\114250-IvW\STJ09-CN301.dgn, Default	Text: Iv='C-ANNO-NOTE' co=ByLevel style='Border #125' ft=3 th=0.036 wt=ByLevel	1
C:\sapwlocal\dms09336\114250-IvW\STJ09-CN301.dgn, Default	Line: Iv='C-ANNO-NOTE' co=ByLevel wt=ByLevel lc=ByLevel'	1
C:\sapwlocal\dms09336\114250-IvW\STJ09-CN301.dgn, Default	... \ Iv='C-ANNO-NOTE' co=ByLevel style='Border #125' ft=3 th=0.033 wt=ByLevel...	11
C:\sapwlocal\dms09336\114250-IvW\STJ09-CN301.dgn, Default	Text: Iv='C-ANNO-TEXT' co=0 ft=1 th=0.042 wt=2	4
C:\sapwlocal\dms09336\114250-IvW\STJ09-CN301.dgn, Default	Text: Iv='C-ANNO-TEXT' co=0 ft=1 th=0.052 wt=2	4
C:\sapwlocal\dms09336\114250-IvW\STJ09-CN301.dgn, Default	... \ Iv='G-ANNO-TEXT-PRD' co=ByLevel style='????????'.DGN Reference borde...	1
C:\sapwlocal\dms09336\114250-IvW\STJ09-CN301.dgn, Default	... \ Iv='G-ANNO-TEXT-DRWG' co=ByLevel style=4 Title of drawing type x sheet d...	1
C:\sapwlocal\dms09336\114250-IvW\STJ09-CN301.dgn, Default	... \ Iv='G-ANNO-TEXT-DRWG' co=ByLevel style=3 Title of heading Drawing type ...	1
C:\sapwlocal\dms08684\IvW\STJ09-G-BS.dgn, Default	NO SCALE DEFINED	
C:\sapwlocal\dms08684\IvW\STJ09-G-BS.dgn, Default	Shape: Iv='G-ANNO-TTLB-FRME' co=ByLevel wt=ByLevel lc=ByLevel' NoFill	1
C:\sapwlocal\dms08684\IvW\STJ09-G-BS.dgn, Default	Shape: Iv='G-ANNO-TTLB' co=ByLevel wt=2 lc=ByLevel' NoFill	1
C:\sapwlocal\dms08684\IvW\STJ09-G-BS.dgn, Default	Line: Iv='G-ANNO-TTLB' co=ByLevel wt=ByLevel lc=ByLevel'	3
C:\sapwlocal\dms08684\IvW\STJ09-G-BS.dgn, Default	Line: Iv='G-ANNO-TTLB' co=ByLevel wt=5 lc=ByLevel'	3

- **Feature Summary Error Report**

Is an optional report that contains one row for each unique feature in a design file. The report lists each unique feature and how many instances of each were found in every design file.

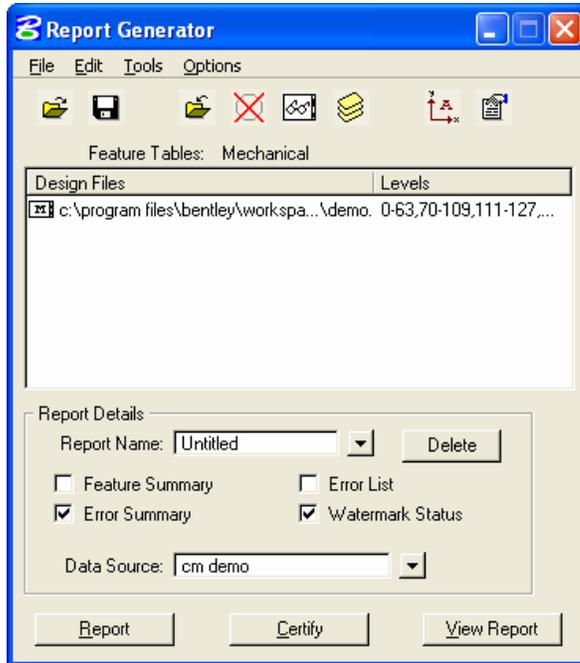
- *Column Name Description*
  - *Design\_File* The design file in which an error was found
  - *Feature* The full name and parent groups of the feature
  - *Symbology* The symbology of this feature
  - *Num\_Features* The number of instances of feature errors in the named file
- CadConform

Design_File	Feature	Symbology	Num_Featu
C:\sapwlocal\dms09336\114250-IvW\STJ09-CN301.dgn, Default	Navigat_Dredg_Plan...	Line: Iv='C-ANNO-SYMB' co=5 wt=1 lc=0'	17
C:\sapwlocal\dms09336\114250-IvW\STJ09-CN301.dgn, Default	***UNKNOW***	Text: Iv='C-ANNO-SYMB' co=5 ft=1 th=0.039 wt=1	10
C:\sapwlocal\dms09336\114250-IvW\STJ09-CN301.dgn, Default	***UNKNOW***	Text: Iv='C-ANNO-SYMB' co=5 ft=1 th=0.039 wt=2	1
C:\sapwlocal\dms09336\114250-IvW\STJ09-CN301.dgn, Default	***UNKNOW***	... \ Iv='G-ANNO-TEXT-DRWG' co=ByLevel style='????????'.DGN (user...	4
C:\sapwlocal\dms09336\114250-IvW\STJ09-CN301.dgn, Default	***UNKNOW***	... \ Iv='G-ANNO-TEXT-DRWG' co=ByLevel style='Sheet identification n...	1
C:\sapwlocal\dms09336\114250-IvW\STJ09-CN301.dgn, Default	***UNKNOW***	... \ Iv='C-ANNO-NOTE' co=ByLevel style='Border #125' ft=3 th=0.036 w...	1
C:\sapwlocal\dms09336\114250-IvW\STJ09-CN301.dgn, Default	***UNKNOW***	Line: Iv='C-ANNO-NOTE' co=ByLevel wt=ByLevel lc=ByLevel'	1
C:\sapwlocal\dms09336\114250-IvW\STJ09-CN301.dgn, Default	***UNKNOW***	... \ Iv='C-ANNO-NOTE' co=ByLevel style='Border #125' ft=3 th=0.033 w...	11
C:\sapwlocal\dms09336\114250-IvW\STJ09-CN301.dgn, Default	***UNKNOW***	Text: Iv='C-ANNO-TEXT' co=0 ft=1 th=0.042 wt=2	4
C:\sapwlocal\dms09336\114250-IvW\STJ09-CN301.dgn, Default	Navigat_Dredg_Plan...	Line: Iv='C-ANNO-TEXT' co=0 wt=1 lc=0'	4
C:\sapwlocal\dms09336\114250-IvW\STJ09-CN301.dgn, Default	***UNKNOW***	Text: Iv='C-ANNO-TEXT' co=0 ft=1 th=0.052 wt=2	4
C:\sapwlocal\dms09336\114250-IvW\STJ09-CN301.dgn, Default	***UNKNOW***	... \ Iv='G-ANNO-TEXT-PRD' co=ByLevel style='????????'.DGN Referenc...	1
C:\sapwlocal\dms09336\114250-IvW\STJ09-CN301.dgn, Default	***UNKNOW***	... \ Iv='G-ANNO-TEXT-DRWG' co=ByLevel style=4 Title of drawing typ...	1
C:\sapwlocal\dms09336\114250-IvW\STJ09-CN301.dgn, Default	***UNKNOW***	... \ Iv='G-ANNO-TEXT-DRWG' co=ByLevel style=3 Title of heading Dra...	1
C:\sapwlocal\dms08684\IvW\STJ09-G-BS.dgn, Default	***UNKNOW***	... \ Iv='G-ANNO-TTLB-FRME' co=ByLevel wt=ByLevel lc=ByLevel' No...	1
C:\sapwlocal\dms08684\IvW\STJ09-G-BS.dgn, Default	***UNKNOW***	Shape: Iv='G-ANNO-TTLB' co=ByLevel wt=2 lc=ByLevel' NoFill	1
C:\sapwlocal\dms08684\IvW\STJ09-G-BS.dgn, Default	***UNKNOW***	Line: Iv='G-ANNO-TTLB' co=ByLevel wt=ByLevel lc=ByLevel'	3

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## Plans Preparation Manual

### CADConform File Checking



#### Icons

The Report Generator dialog box provides shortcuts for the menu commands. The icons are described below:

#### Open Job

Opens a pre-defined Report Job file. See the “File > Open Job...” menu command.

#### Save Job

Saves the current Report Job file. See the “File > Save Job...” menu command.

#### Add Design Files

Opens the File Selector to add and remove design files to or from the report dialog. See the “File> Select CADs...” menu command.

#### Remove Design Files

Removes the selected design files from the list. See the “Edit > Remove” menu command.

#### Find Reference Files

Finds the reference files of the selected design files. See the “File > Find DGN Refs” menu command.

#### Set Levels

Sets the reported levels of the selected design files. See the “Edit > Set Levels” menu command.

#### Drawing Scale

Opens the Drawing Scale dialog box.

#### Advanced Options

Opens the “Advanced Options” dialog box that provides the options:

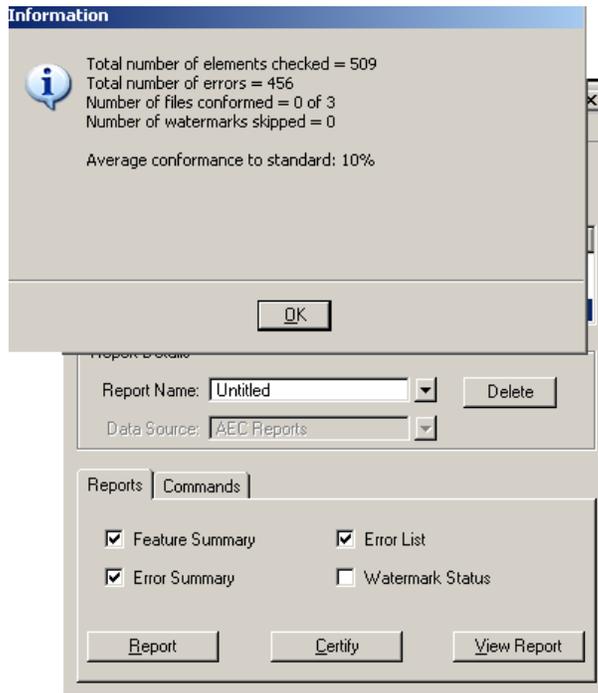
- **View Report.**
- Report Type

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### Plans Preparation Manual

### CADConform File Checking

- Info
- Design Files
- Error List
- Error Summary
- Feature Summary



- Feature Summary
- Error Summary
- Error List

Several different report types can be generated for the chosen design files. They include:

- A Feature Summary
- An Error Summary
- A Detailed Report of Each Error A

Additionally, two compulsory reports are generated every time a report is produced:

- A Report Information Table
- A Design File Summary Table

### **Report Generator**

The report generation process involves the creation of various report tables in the database. Reports can be manually or automatically exported to text or comma separated (CSV) files.

### **Conform**

Conform is the tool that changes the symbology of design file elements to match a feature in the Feature Table. It operates similar to a word processor, allowing each error to be viewed, corrected or added to the feature table individually.

### **Scan Options**

Scan Options define user options specific to an individual run of Conform. This tab page has the following dialog items:

Scan Levels  
Drawing Scale

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### Plans Preparation Manual

### CADConform File Checking

CadConform for Microstation User Manual  
The Scan Options tab page of the Scan Criteria Dialog Box

#### **Generating Reports**

The Report Generator is used to create reports on a list of design files that do or do not match any of the features in the chosen Feature Tables. The Report is generated as a database table, either in the CadConform database, or in a separately chosen ODBC data source (as defined by the user). This database table can then be printed out, converted to a text file or other file format, or used to generate a customized report, by using a database application such as Microsoft Access. Several different report types can be generated for the chosen design files. They include:

- A Feature Summary
- An Error Summary
- A Detailed Report of Each Error
- A Watermark Report

Additionally, two compulsory reports are generated every time a report is produced:

- A Report Information Table
- A Design File Summary Table

Note that to overwrite an existing report, the user must be either:  
An administrator, or the creator of the report.

As with Conform (checker), the Feature Tables must be chosen before a report can be generated. The chosen Feature Tables define which features are allowed for each design file in the report. Once the Feature Tables are chosen and imported using the Feature Table Manager, the Report Generator dialog box will open.

The Report Generator allows the user to process one or more design files for each report. Reference files for each design file can also be reported on by using the "Find References" tool.

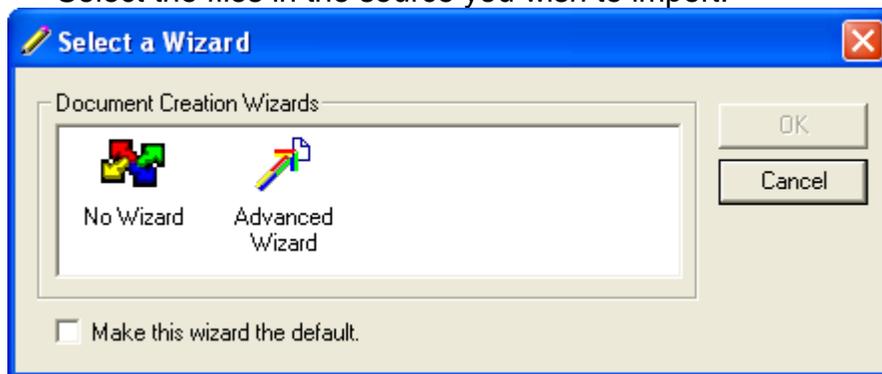
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[Plan Preparation Manual](#)  
Project Wise Scan Reference Workflow

Project Wise Scan Reference tool scans various folders and files to find reference files that have been attached to project sheet files. The Scan Reference tool as shown and described below gives the user the ability to redefine the connection to reference design files that were attached outside of the Project Wise environment. For example, AE design file submittals that have been imported into project wise would not recognize the previous reference attachment paths. Therefore new definitions must be defined. The Scan Reference tool does that task for the users.

The descriptions below will lead you through the scan reference process.

### Step 1 Import Files

- Open the folder or source containing the files you wish to import into Project Wise
- Open the Project Wise XM Explorer application and browse to and open the folder where the files are to be placed.
  - \*\* Be sure to place sheet files and model files in the appropriate folders. These file should always be segregated so don't place sheet and model file in the same folder during the import routine.
- Select the files in the source you wish to import.



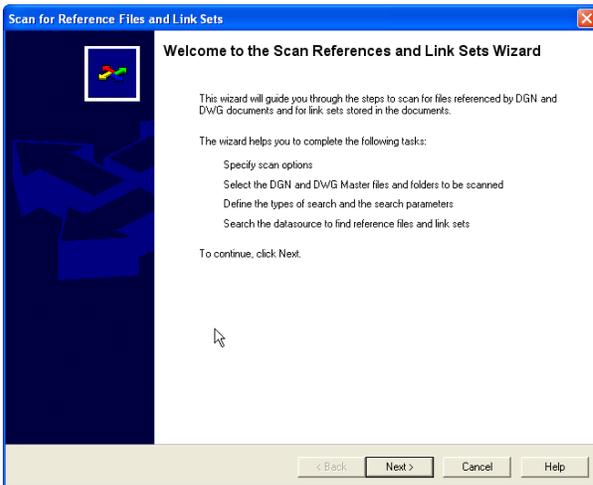
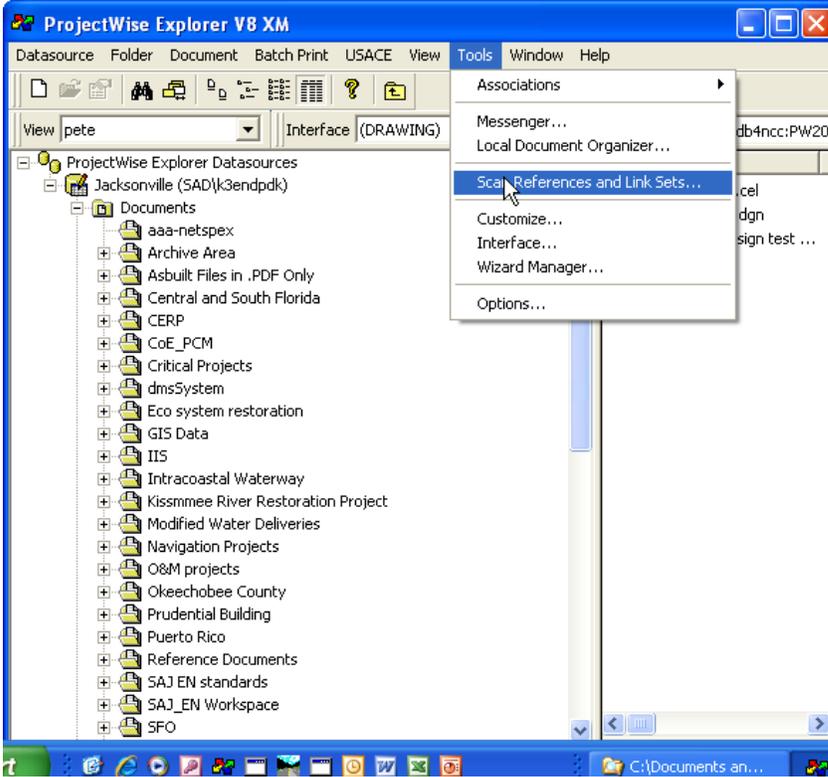
Once the files are imported into the Project Wise Explorer project folder the Select a Wizard dialog will appear as seen above. Select 'No Wizard' icon and select OK. The file(s) is immediately added to the Project Wise folder. Repeat the same process, for Model file importing them into the appropriate folders.

# Appendix A-7 Plan Preparation Manual

## Project Wise Scan Reference Workflow

### Step 2 Scan References

From the Project Wise dialog main menu, select Tools, and then Scan Reference and Link Sets as shown below.



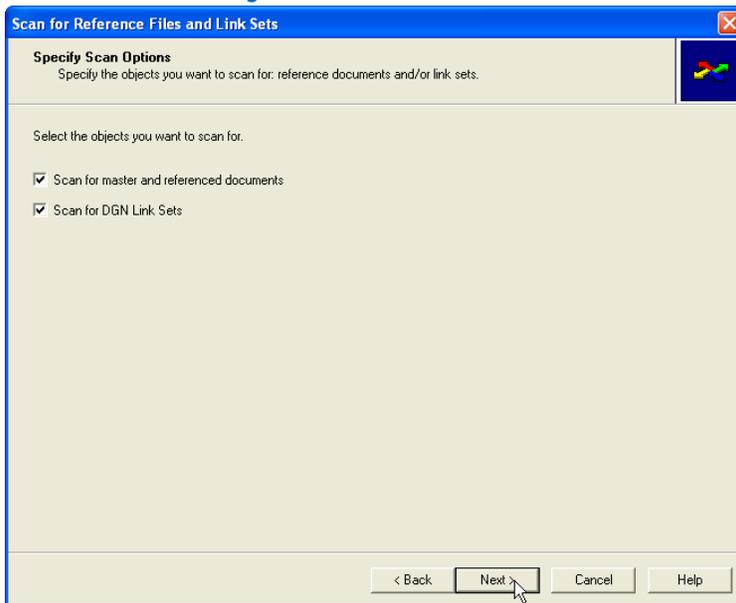
This dialog is only an introductory dialog. Press Next.

Select Next in the Scan Reference Files and Link Sets dialog. The Link Sets option box is not a setting that affects our type of design file workflows but having

# Appendix A-7

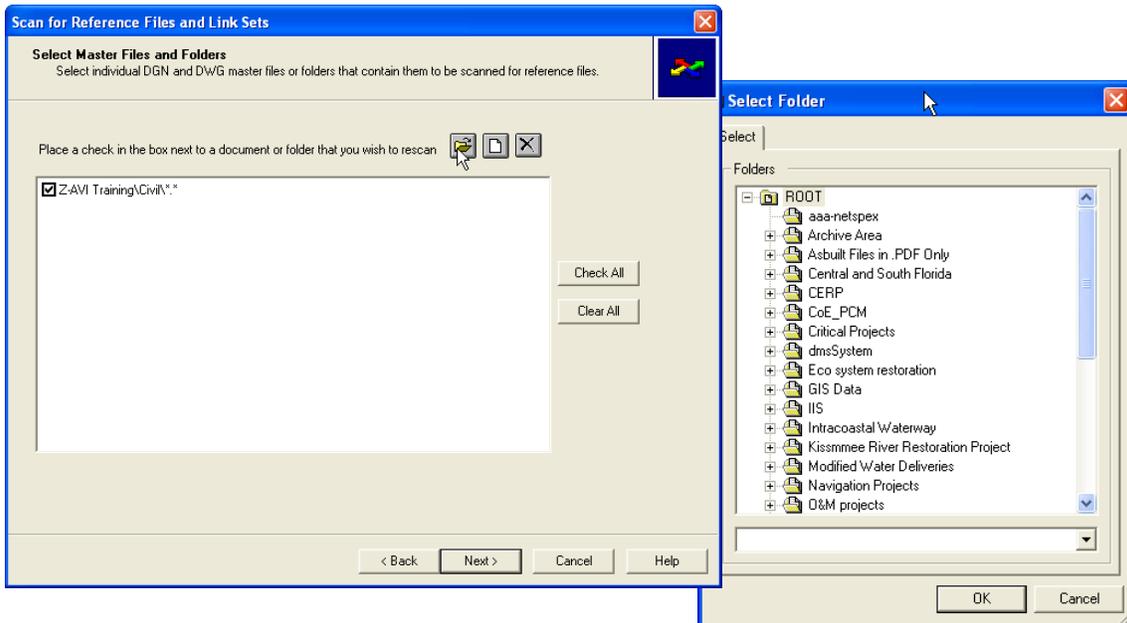
## Plan Preparation Manual

### Project Wise Scan Reference Workflow



the dialog box checked will not hinder the workflow we are performing so you can leave it checked if you wish.

In the dialogs in below are shown the selection of the folders that contain the master files. Master files are those folders that contain the sheet files or those files that have references attached to them. Notice the Select Folder that will



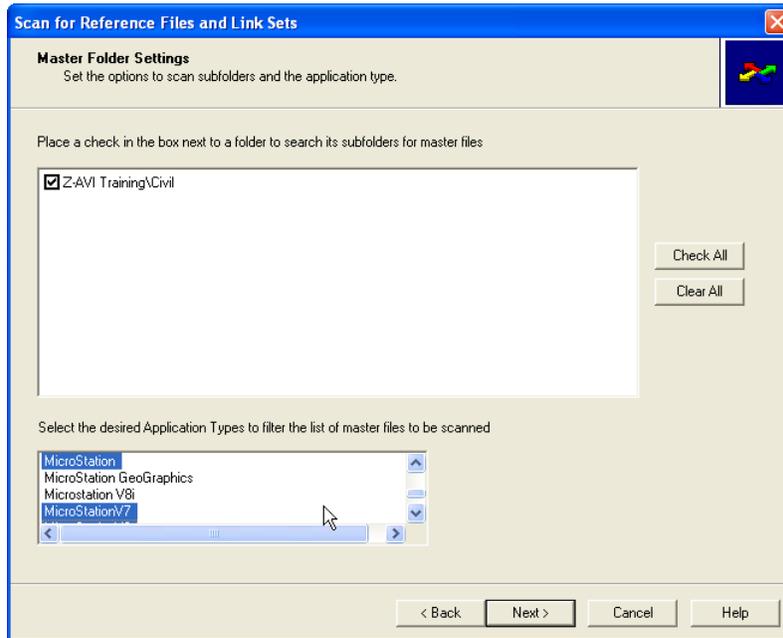
appear once you select the folder icon

from the main dialog. Be sure you are selecting all folders that contain the master files for whose reference you wish to search.

# Appendix A-7

## Plan Preparation Manual

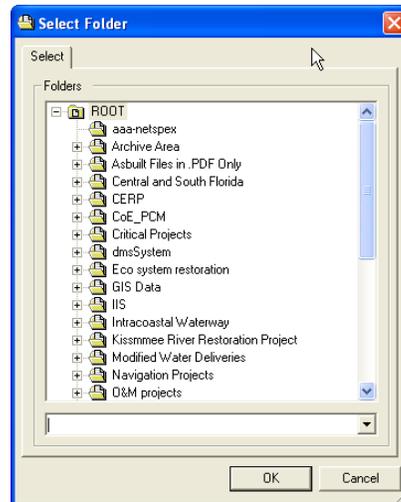
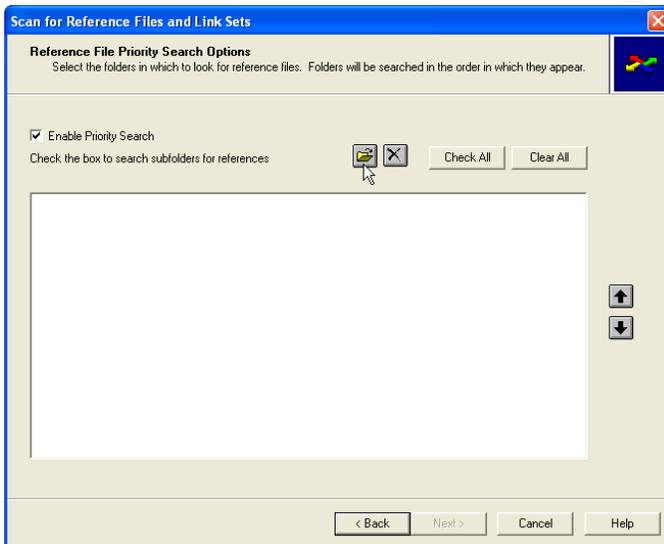
### Project Wise Scan Reference Workflow



Once the folders containing Master files have been selected Choose the Application type for which you wish search. It is suggested to select Microstation, Microstation V7 and Microstaion V8. This will insure that the files are found no matter which application has been assigned to the files during import.

Now that the files and folders containing reference attachments have been identified,

Select Next to identify the folders to search for reference file attachments as shown below.

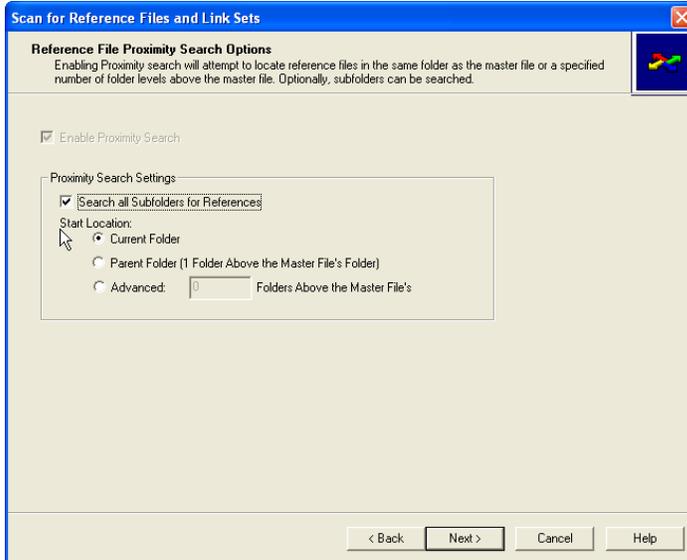


Enable Priority Search — If checked, you can select the folders that are to be scanned for the presence of references documents, and also the order in which the selected folders are searched. This is different than the previous two pages you encountered, which dealt with scanning for the presence of master documents.

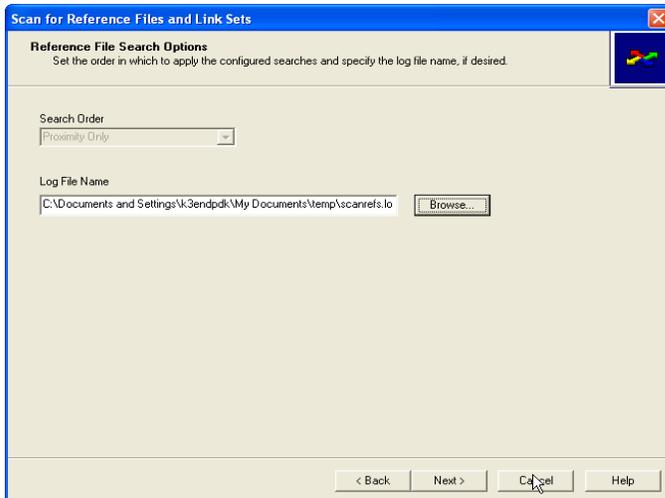
## Appendix A-7 Plan Preparation Manual

### Project Wise Scan Reference Workflow

If this option is off, you cannot select any other items on this page, and you must instead enable a proximity search on the next page of the wizard.



If no priority search is conducted, Figure 8 provides the settings for a proximity search. Select the appropriate selections from the Proximity Search Settings box and select Next>

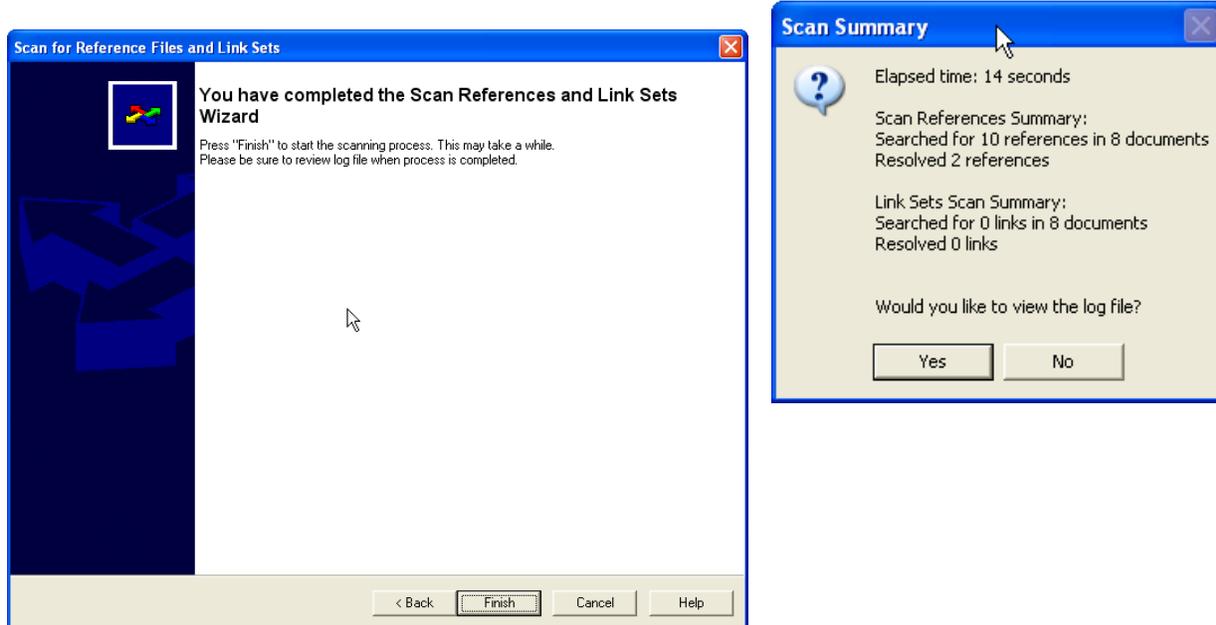


The Reference File search Options Continued in the dialog to on the left provides for the identification of a location for the search log file. Select the Browse button and identify a location and create a name for the file if desired.

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## Plan Preparation Manual

### Project Wise Scan Reference Workflow



The wizard dialog above shows the last scan references wizard setup dialog. Once finish is selected, the scan will begin. The dialog will update the user as to the progress of the search and when complete will display a Scan Summary as seen above. The examples above was no using an actual project so the results are not satisfactory. The process is the same however and the success of the scan will depend on the user identifying the appropriate files and folders to scan. Knowing which files and folder contain the reference files is important to a successful scan.

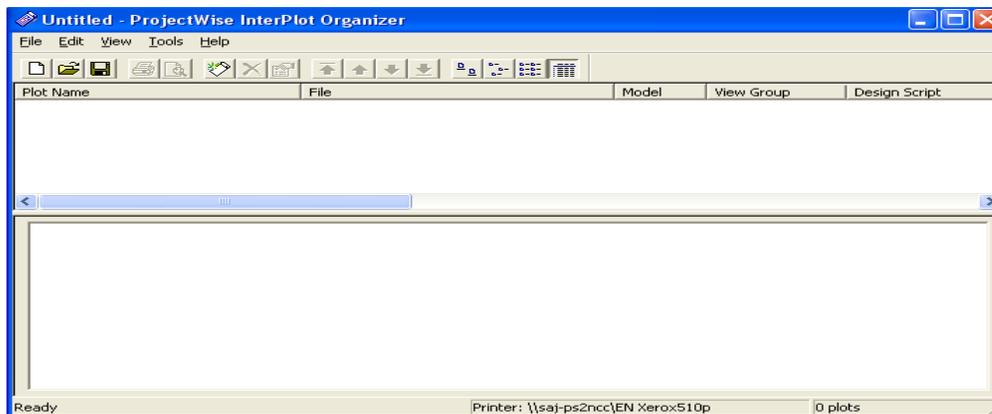
# Appendix A-8 Plans Preparation Manual Plotting Using Bentley IPLOT

## IPlot BATCH PLOTTING

### WORKFLOW:

#### Step 1. Project Design file preparation.

- Insure that the DGN files are formatted correctly and standard compliant.
- Open the Project Wise IPLOT Organizer application by selecting the IPLOT Organizer Icon on your desktop or from the Program list. The Organizer should open as an empty dialog on you screen as shown below.



- From the IPLOT Dialog main menu, select File> Project Wise Login.
  - You should see the Login Dialog similar to the one you see below.

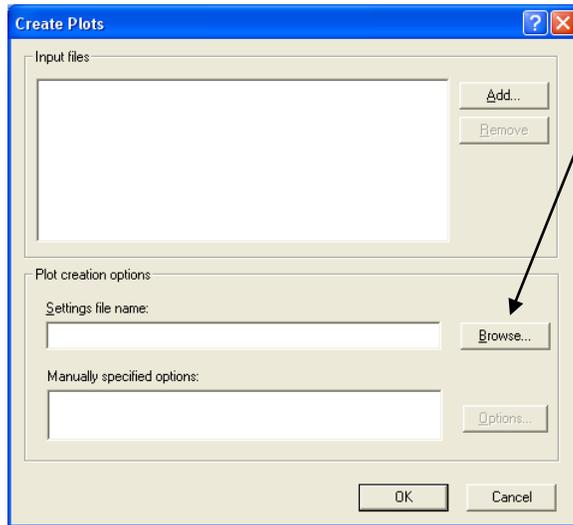


#### Step 2 Setup Plot Properties

- The Setup Properties have been provided with some standard configuration that may be helpful..

## Appendix A-8 Plans Preparation Manual Plotting Using Bentley IPLOT

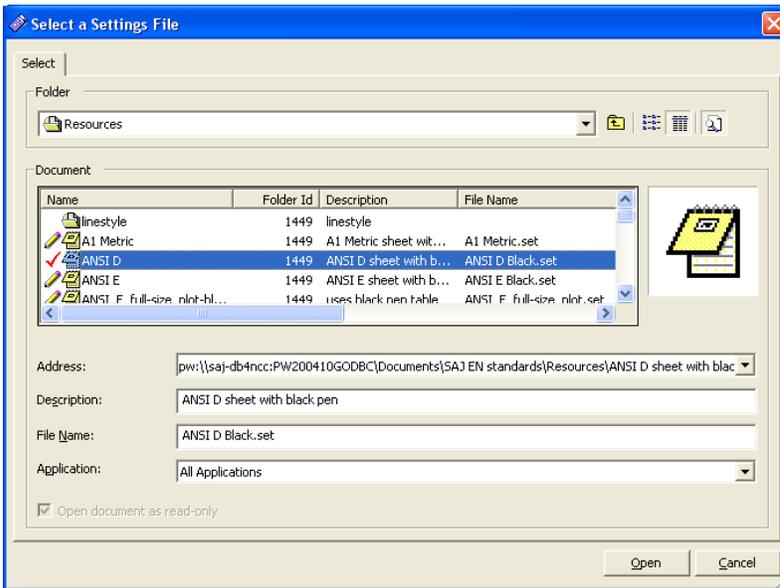
- First, Load the 'Create Plots' Dialog by selecting from the IPLOT File Menu item the Create Plots item. You will see the Dialog below



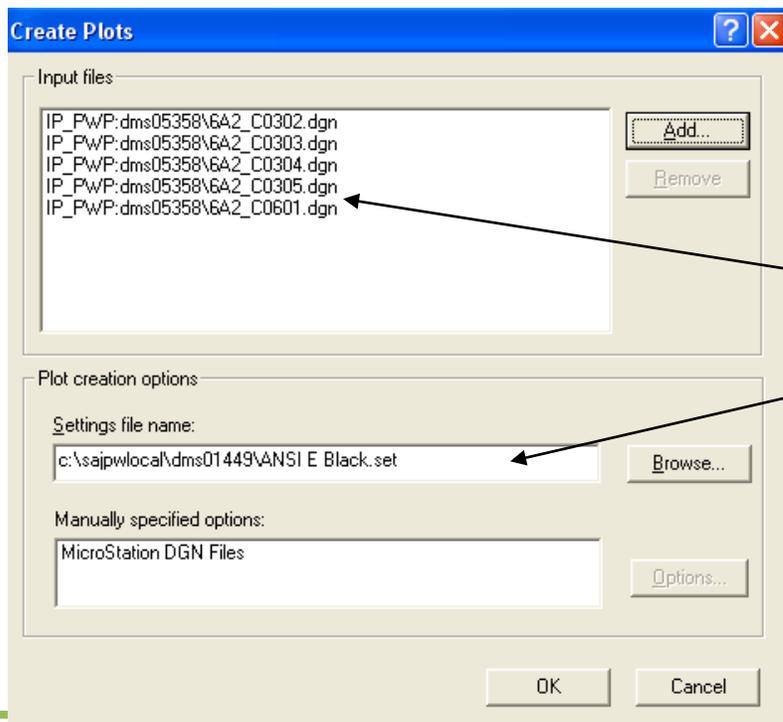
Select the Browse Button to get the Set file.

- Selecting the Browse button will display the Project wise Select Settings File dialog. Browse to the SAJ\_EN\_Workspace\Resources directory to select the settings file. As shown in the dialog below.

# Appendix A-8 Plans Preparation Manual Plotting Using Bentley IPLOT



- o Notice that these Pre-set or SET files are named for the actual sheet size



File Added from Project Folder

Set File loaded from the PW resources folder and is then copied to the Local PW folder as seen here.

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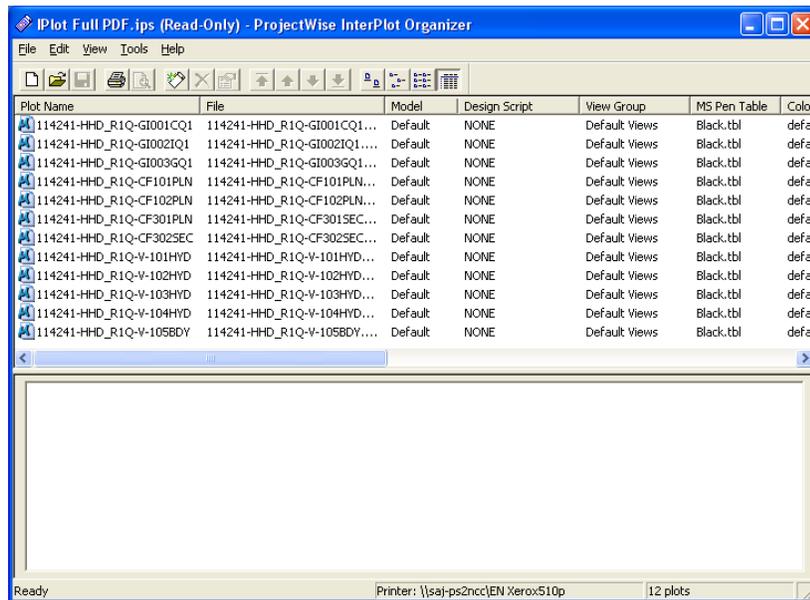
## Appendix A-8

### Plans Preparation Manual

### Plotting Using Bentley IPLOT

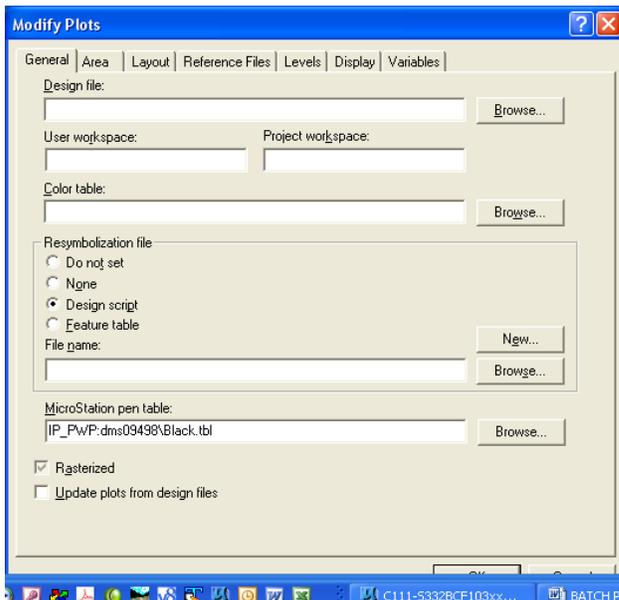
- Some are set to produce half-sized plots sets, some metric, etc.
  - The Presets have been prepared and stored in Project wise in the SAJ\_EN \_Workspace\Resources\IPLOT directory for you benefit. The user can choose to create the plotting properties from scratch as project requirements dictate. This guide shows various examples of the presets for demonstration purposes only.
  - Once the Plot settings file is loaded the files to be plotted should be loaded. The dialog below shows the files already loaded in the add file dialog. If the user is creating the plot configuration 'from scratch' the files to plot must be loaded before the plot properties can be defined.
  - Once a settings file is loaded and the files to be plotted are also loaded select the OK button to load the files in the IPLOT Main Dialog as shown below.
  - Next the Main IPLOT dialog will appear showing the file to be plotted loaded in the dialog.
- 
- As each file loads the window at the bottom of the IPLOT main dialog, the window lists each file as it is copied out. It tests the file with the attributes which the SET file is assigning to it. If there are errors they will be listed beneath each file listed. If no errors exist the lower window will just list the files as the property attributes are assigned.
  - Once a Batch plot has successfully been made a batch 'plotset file' can be saved, containing all the configurations and files, this file has the IPS extension on the file name.

# Appendix A-8 Plans Preparation Manual Plotting Using Bentley IPLOT



- Later the file can be opened and re-plotted as needed by opening the previously created IPS File to the IPLOT Dialog and plotting.
- The following examples show various IPLOT properties dialogs that are used in setting up a plot set to be saved as an IPS file similar to the one shown above.

## Appendix A-8 Plans Preparation Manual Plotting Using Bentley IPLOT

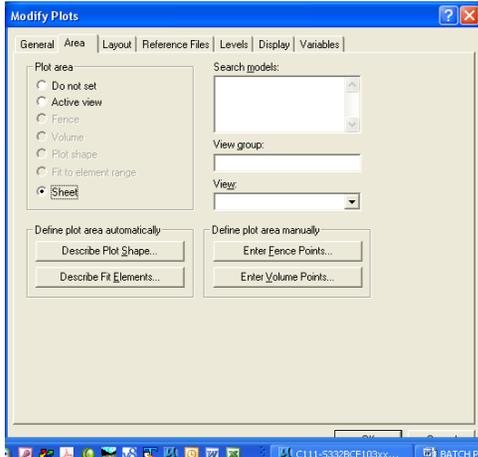


Notice below that there is a field to add either a Design Script or a Microstation Pen Table. It is recommended that you use Design Scripts that have been created and provides the best results in most cases.

Design Scripts are IPLOT pen tables and are created using basic language code syntax. For special circumstances, special Design Scripts can be produced in a few minutes. It is very important that you provide a consistent Logical Name in the Reference file dialog. If you have the same file referenced numerous time in a project each logical name must be the same. i.e., a reference file showing property/lot lines may have a logical name of 'Prop'.

The General tab above in the IPLOT Properties dialog. The majority of the fields in this tab are not used for most applications. Sections of greatest importance is the Resymbolization section and the Microstation Pent Table section. The user can use either method to assign graphic symbolization to the plot files as needed. The Admin team has created some design scripts or IPLOT pen tables for special purposes. These are more difficult to generate due to the strict basic programming language that must be used with very specific syntax formatting. The user may instead choose to use the Microstation pen tables to symbolize their plot files. The only caveat is that the user will find creating the pen tables easier while in Microstation Plotting dialog.

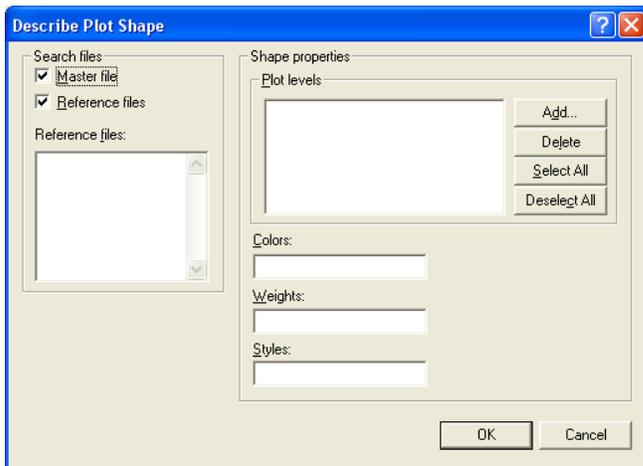
## Appendix A-8 Plans Preparation Manual Plotting Using Bentley IPlot



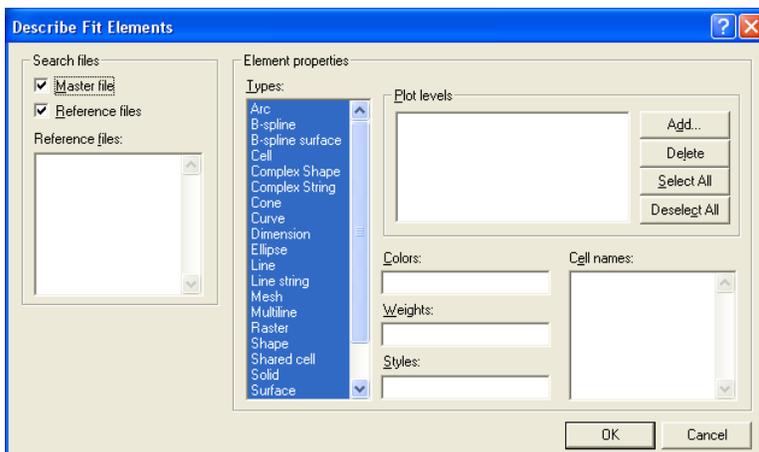
This dialog shows the properties of the Area tab. The most valuable part of this dialog is the choice to select the sheet file as the definition of the plotted page. In this way the plot scale is set based on the page size. The Sheet model set up while in the design file has determined the scale of the plot and the page size. The second choice is selecting the plotting shape and scale base on the size of a fence. The button titled *Describe Plot Shape* allows the user to define a shape by level name, color, line style, and/or weight. If the border is a cell, the *Describe Fit Elements* button can be selected and the cell or element properties described in the fields provided.

Describe plot shape provides fields to enter the definitions of element attributes of a shape. For example, the selection might be the shape at the trim line around the border/title block. This trim line shape is consistent in each file since the same border is referenced to each sheet file to be plotted.

## Appendix A-8 Plans Preparation Manual Plotting Using Bentley IPLOT



Below is the Describe Fit Elements Dialog. This is most useful for a border that is a cell. The Element type can be defined as a Cell and the Cell name field can be defined with its name.

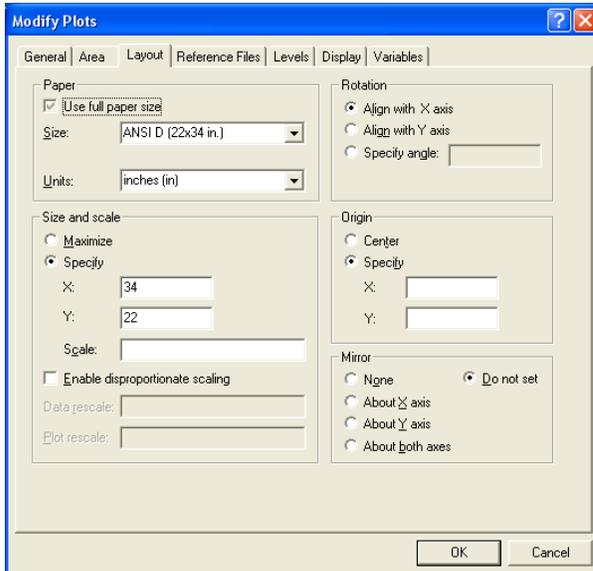


It is recommended that in all cases possible that the user creates Sheet Models when creating the sheet files so that the plot definitions is defined simply as Sheet. Then the plot scale is already defined by a sheet size.

The Layout Tab is the last area of focus for general plotting needs. This dialog as shown below, provide the user the opportunity to define the paper size, the units (inches is used for all of our non-metric projects), Rotation should always

## Appendix A-8 Plans Preparation Manual Plotting Using Bentley IPLOT

defined as Align with X axis for all landscape plots. If the Size and scale is defined as the paper size X an Y dimensions, then the scale need not be defined.



Once these items are set, select the OK button and these settings should be applied to each of the files in the plot set.

### Step 3 Plot the Drawings

Selecting the print icon from the IPLOT main dialog will send the selected plots to the printer selected.

### Step 4. Archive successful plot solution

Once a satisfactory plot quality is achieved, save the IPS file containing the plot files. IPLOT creates two files once a plot set is created. One has an (.i) file extension and the other an (.m) file extension. These files are saved in the Project Wise local Folder ID where the IPS file is generated. These files can be used to send the plot files to the plotter later. These files are more secure than the IPS file that can be easily changed, files deleted, or reordered. Call the CADD Coordinator for more information.

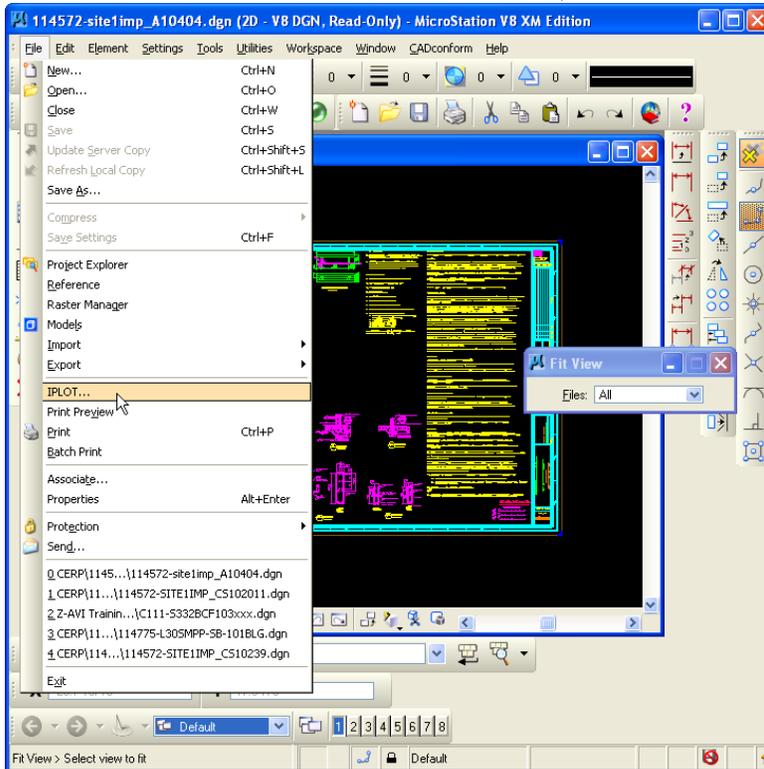
# Appendix A-8 Plans Preparation Manual Plotting Using Bentley IPLOT

## IPlot FOR SINGLE PLOTS

Single plots using IPLOT from Microstation can be achieved without using the IPLOT Organizer used to create batch plots. To start the IPLOT application, start Microstation open the file you wish to plot and follow the steps described below.

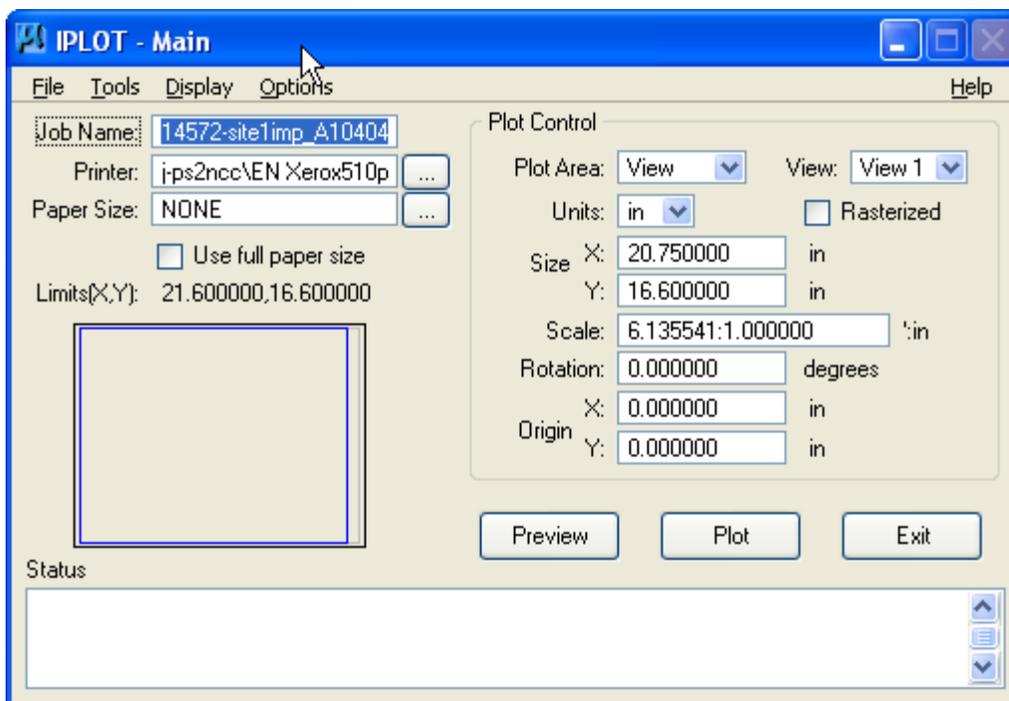
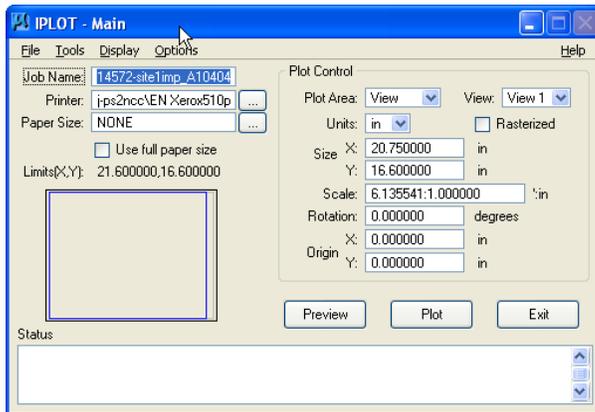
### Step 1. Start IPLOT

- From the Microstation File menu, select IPLOT... see the dialog below.



- This will open the IPLOT plotting dialog... see the dialog below

## Appendix A-8 Plans Preparation Manual Plotting Using Bentley IPLOT



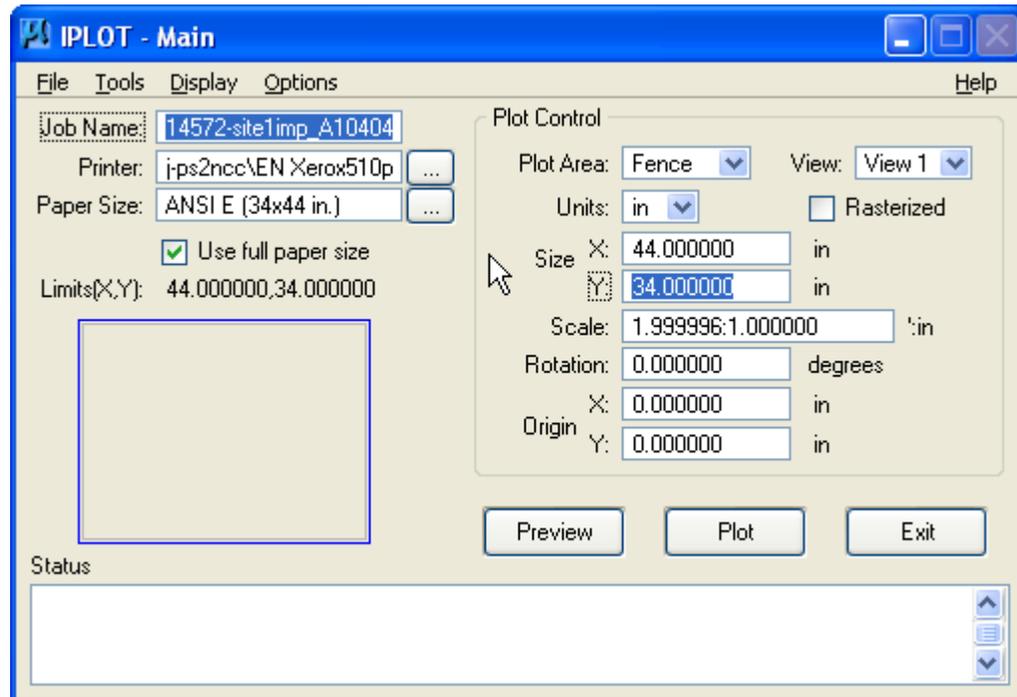
- In this view of the IPLOT dialog, you can see the various options and menus.
  - Look at the left side of the dialog the job name is listed (this is the file name by default).
  - The Printer field list the printer selected.
    - Printers are configured for use with IPLOT. Only a select few printers are configured for IPLOT. Contact the CAD Manager for a complete list of which printers are configured.
  - Paper Size is a critical field. We use only two sheet sizes or paper sizes, ANSI D and ANSI E for full size plots. If half-size plots are

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## Appendix A-8 Plans Preparation Manual Plotting Using Bentley IPLOT

planned, select a size that has the same aspect ratio. For example if the sheet to be plotted is an ANSI E full size and a half-size is desired for the plot, then you should select the ANSI C paper size. Likewise choose an ANSI B for a half-size of the ANSI-D.

- Placing a check mark in the “Use full paper size” will expand the virtual plot size to the margins of the paper size chosen if the aspect ratio is compatible and a fence is placed at the boundary of the file.
- The view below shows the dialog with the printer, paper size, fence placed, and use full paper size selected

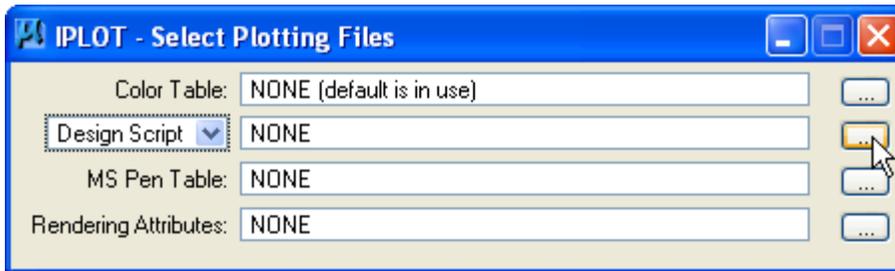


- Next, in the IPLOT dialog, choose the File menu item and then choose one of the items explained below.
  - The Select plotting files opens a small dialog of the same name. This dialog will be used by our organization to select the Design Script or IPLOT Pen Table. The Browse button at the right of the Design Script field will start the Project Wise browse window to find and select the desired pen table.

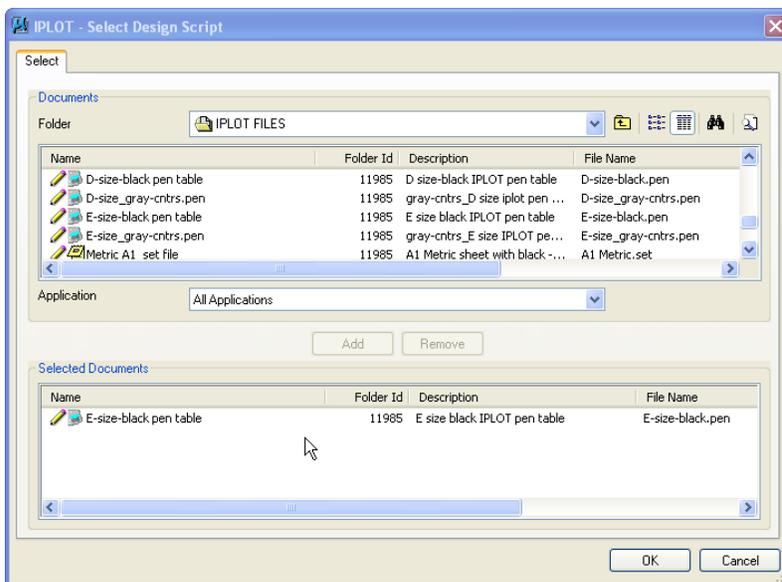
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## Appendix A-8 Plans Preparation Manual Plotting Using Bentley IPLOT



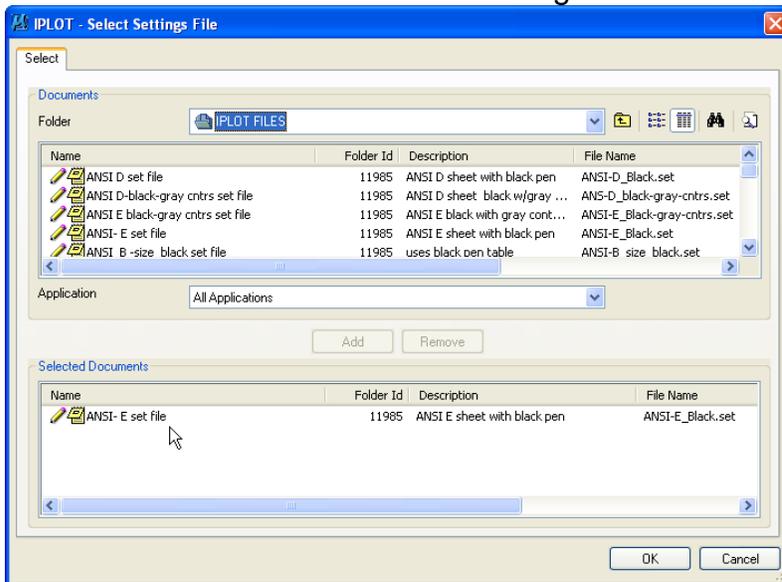
- See the Project Wise browse window shown below. In this case the E-size-black pen table has been chosen. This file will operate within the plot file to cause all lines and text to be plotted black as well as defining line and text weights. Other pen tables provide different plot file modifications such as plotting contours in a gray scale and reducing the priority of those elements so that other feature element can be displayed on top of any contour elements to avoid hidden feature line in the final plot.



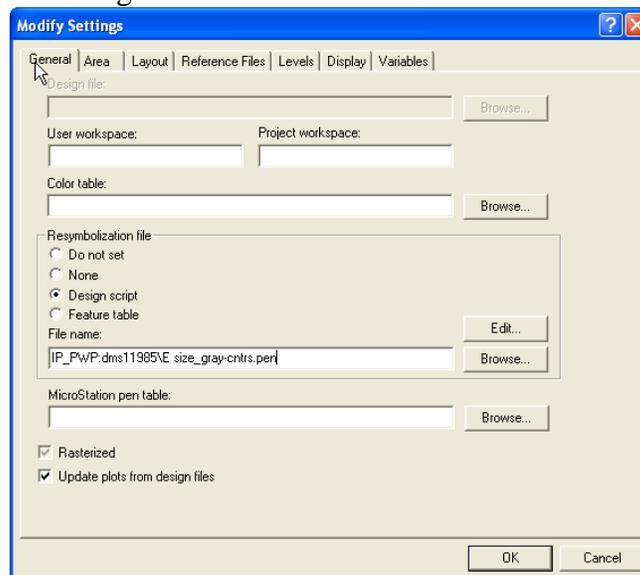
- The Select Settings option. *(It is assumed that you are logged in to Project Wise.)*
  - This item will open the Choose Settings File browse window from Project Wise. Each of the Settings files or .SET files are previously set up containing all of the appropriate settings including the attributes of the border shape on to which a

## Appendix A-8 Plans Preparation Manual Plotting Using Bentley IPLOT

fence will be placed, the pen table to be use, the sheet size and all other settings that would normally be set manually.

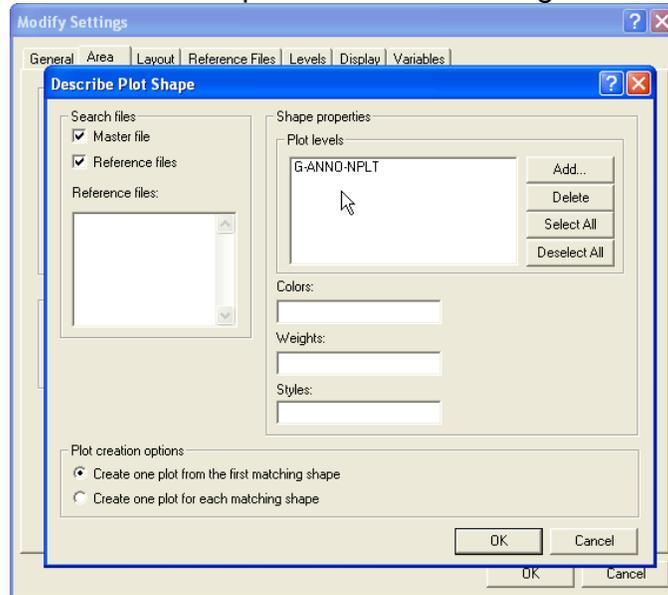


- In the example above the ANSI-E set file Provide all needed plot properties. *See the example below to see the automatic setting that will be applied to either in this example of a single plot or in the IPLOT Organizer.*
- Shown here is the General tab of the Setting File. Note that the Design Script or Pen Table is selected as well as Update from the Design File.



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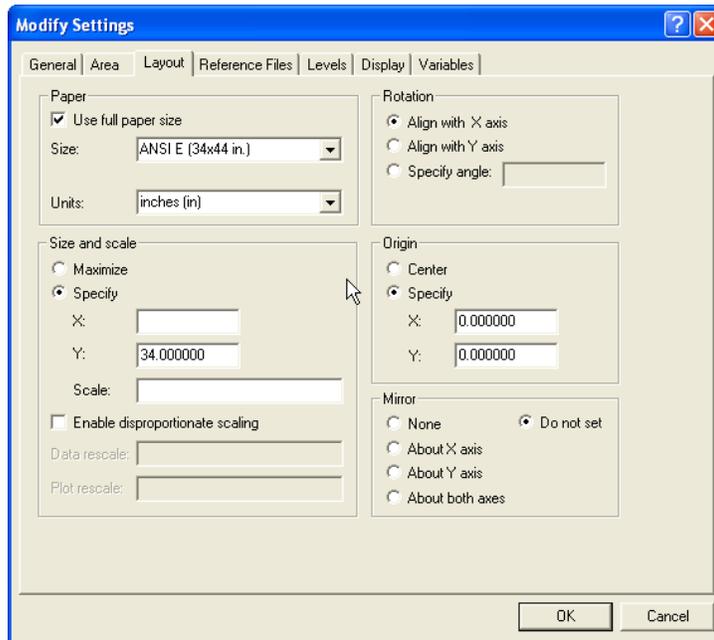
- Shown here is the Area tab with the Describe Plot Shape selected. Note that these settings define how and where the fence will be placed. These setting can be described as



a level name or by color, weight and style of the shape to be used.

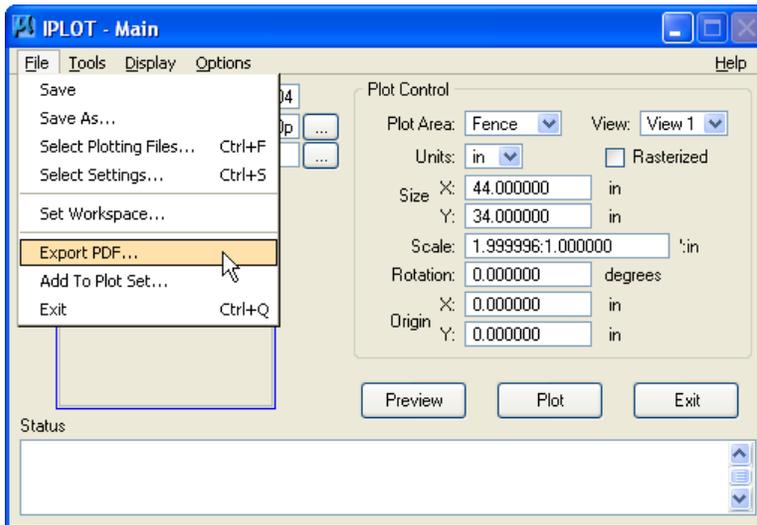
- Shown here is the Layout tab. Although this tab is the first to be displayed when the plot file settings opens, they have been show in order from left to right for the purpose of this workflow. Paper size, plot units, plot size and scale, rotation, and plot placement origin on the plotted paper is shown. Mirror is not used in our general workflows.

# Appendix A-8 Plans Preparation Manual Plotting Using Bentley IPLOT



The additional tabs are not generally used in the plot setups in our workflows.

- The dialog shown below has been completed and is ready to preview or to plot. Plotting can be accomplished by sending to a configured printer or plotter or exporting to a PDF file.



Either of these three option should result in the same quality result.

For assistance contact the Design Branch CADD Coordinator .

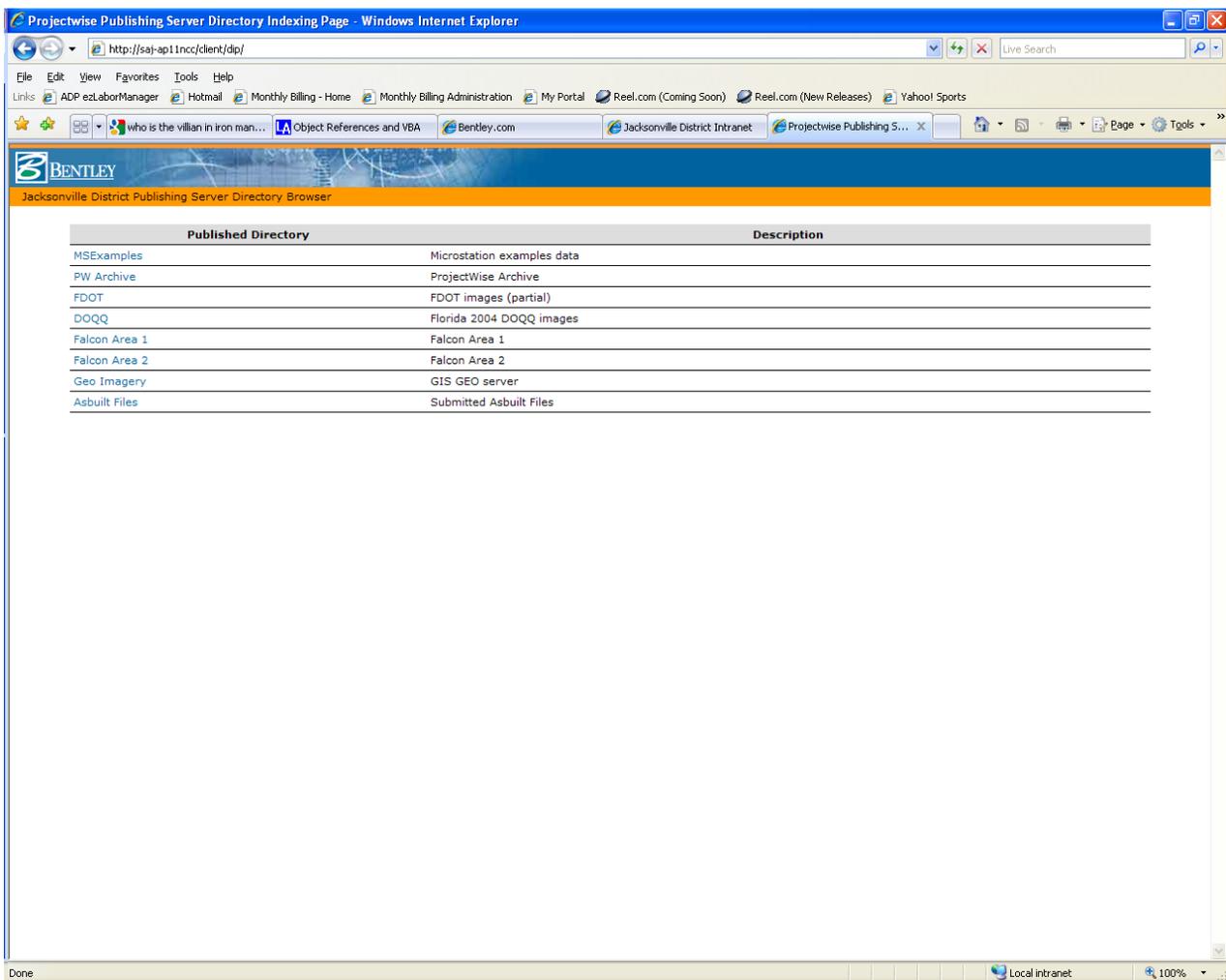
# Appendix A-9

## Plan Preparation Manual

### Legacy Drawings Access Workflow

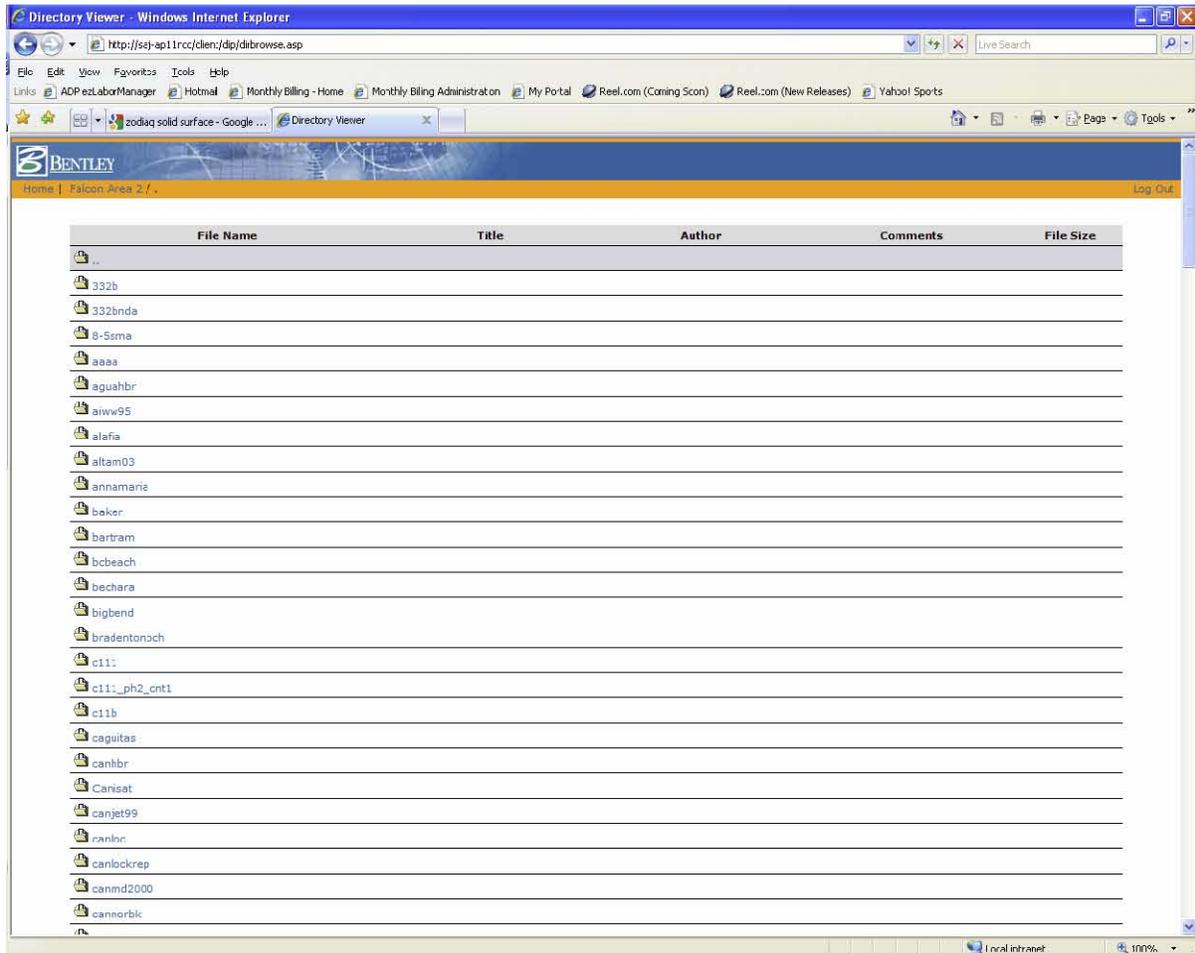
To obtain legacy drawings or archived images, for example, files that were stored on the old Falcon system, you must do the following steps:

**Step 1** Visit the web address <http://saj-ap11ncc/client/dip/>.



# [Apendix A-9](#) [Plan Preparation Manual](#) [Legacy Drawings Access Workflow](#)

**Step 2** Select a specific area in which the legacy file may be stored. For example, click the link for either Falcon Area 1 or Falcon Area 2.

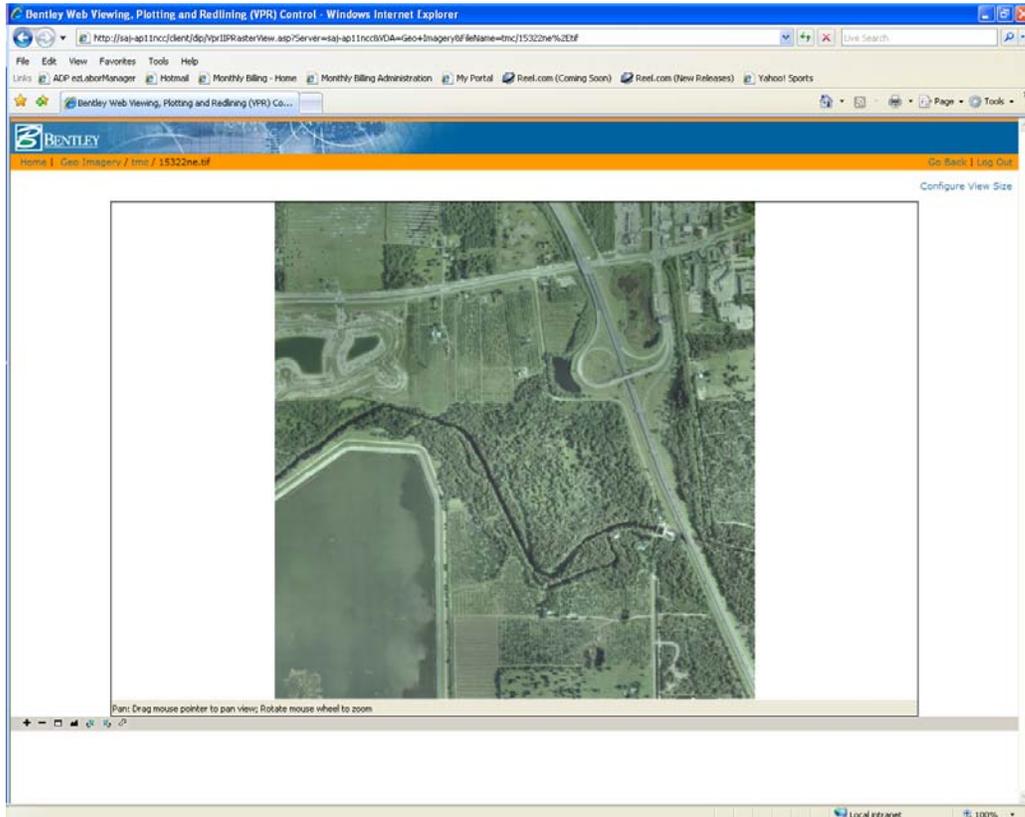


## Appendix A-9

### Plan Preparation Manual

### Legacy Drawings Access Workflow

**Step 3** Once you navigate through the folders you will reach the file list. Click the link on the file. The system will process the file and generate an image file to be displayed.



Below are detailed the follow-up process steps.

- 1) If the displayed file shows the correct drawing, contact CADD Manager and provide him with the directory path and file name being requested.
- 2) Before the file can be sent to the users, The Administrator must execute a program that will convert the legacy file to the current version of Microstation. If this is not done, a majority of the drawing objects may be lost and the file will be missing many elements.
- 3) Once the file(s) is processed, the file location/path will be forwarded to the requesting user via email indicating the Project Wise file(s) new location or placed on a CD or DVD if needed.

# Appendix B-1

## Plan Preparation Manual

### Presentation Quality Checklist

#### **Item 1. Determine Design Plotting Scales and associated graphic entities.**

Plotting scale is critical in order to determine text heights to be used in the design file. Design work prepared in design model files as apposed to sheet files is especially critical to be cognizant of the resulting plotted scale if or when text is used in a model file.

Consider the checklist items below when preparing model and sheet files:

#### **Checklist for Text associated Scale(s)**

- What will be the plot scale?
- 
- Set text heights as appropriate for plot scale. (Use Text Styles from Standard DGNLIB. File name: USACE-Dim-TextstylesTT.dgnlib)
- Set the appropriate line type scales.
- Plan features. (Place on sheet file, proportion/scale, etc.)
- Symbols (weights, size, text legibility).
- Detail/Section Scale (size on sheet), special treatments of section cut lines using enhanced weights and line styles.
- Feature titles, subtitles, north arrow, graphic scale(s).
- Consider scale for section and details presentation requirements for:
- Text fonts and sizes
  - The text definitions below are defined by using a plot scale multiplying a text height sized at a scale of 1"=1' and are based on finished text sizes at plot time. **The use of text styles for placement is the required method of text placement. The Drawing Scale tool and scale factors used in sizing text is described in the General Appendix workflow entitled 'Using Text Styles and Drawing Scales'.**
    - Main subject titles should be shown at .200 x scale factor. Font: Arial Black.
    - Sub titles should be shown at 0.175 x plot scale and Arial Black Font.
    - Headings should be shown at 0.140 x plot scale. Font: 3 (Engineering).
    - Annotation w/ leaders at 0.120 x plot scale. Font: Arial.
    - General Notes at 0.120 x plot scale. Font: Arial.
    - Graphic Scales should be consistent in type and format throughout the project drawing set. Coordinate with the project lead technician.
    - Hydrographic Text including (water body labels such as creek, river, basin, lake, and ocean titles), flow

# Appendix B-1

## Plan Preparation Manual

### Presentation Quality Checklist

direction labels, channel range text, etc. Create at a 22 degree slant.

#### Item 2. Sheet file/Drawing Layout Presentation

- Plotted drawing layout must be clear in its presentation; drawings must clearly communicate design purpose and concepts. In order to meet this goal, you must be particularly attentive to display presentation purpose and focus. For example, if you are showing features to be constructed as well as existing features, the best way to accomplish this is the use of line styles and weights. When level symbologies do not provide such segregation, level overrides coupled with the discrete use of reference files is the proper methodology. Your senior technician or CADD Manager can help with such workflows.
- An alternative method is to use pen tables to achieve graphical discrimination in dgn file plots. Usually a simple pen table can be prepared to achieve the desired outcome. It must be noted however that the use of pen tables, while achieving the desired result in a plot does not solve the issue when looking at a dgn file in Microstation or when exporting the dgn file to other users outside of your workspace environment.
- Use the categories below to help in focusing the drawing preparation on improving presentation quality.
- **Line weights and line styles:** Line weights contrast drawing features and focus the viewer's eye to the focus of the displayed feature. Line styles help to show differences in the features' status such as existing or proposed features, hidden feature lines, items to be demolished, etc.
- **Feature Position:** How the features are positioned in the sheet can make the difference between an unorganized sheet and a clear and quality presentation.
  - Care shall be taken in balancing 'used' versus 'white space' in a sheet. Items should be placed so that each sheet is neat and avoids the appearance of wasted space or cluttered sheets. If needed a new sheet should be created to avoid such crowding.
  - Each sheet shall follow rules of drafting etiquette. Major focus features shall when ever possible be oriented on a sheet to give order to the information on each sheet.
    - Sheets flow from left to right and top to bottom. In other words main features should be ordered and placed from top left to the right and down. If you have a plan (main feature), Detail, and a section, then the proper order is to place the plan in the upper left portion of the sheet (left to right), the Detail below on the left and the section below to the right of the detail.

Appendix B-1  
Plan Preparation Manual  
Presentation Quality Checklist

- Graphic scales and north arrows shall be placed in the lower right of the plan or sheet. When not possible, place the north arrow as close to the lower left of the plan feature as possible.
- **Text Fonts, Sizes and Weights:** Historically Corps design text usage has its roots in the Leroy system. CADD text fonts in the Corps emulated those font styles. Many Corps customers use AutoCAD design based software with fonts unrelated to our Leroy-based standard texts and this difference has always caused translation problems. Substitution of these fonts when translating from one format to the other has always caused major presentation quality problems. It was determined that a common font style was needed in order to avoid such problems forcing unnecessary editing problems. The common text between both platforms is True Type fonts. Among these fonts, Arial is the cleanest and most readable. **A-E design firms and Corps personnel preparing project designs shall use the True Type Arial and Arial Black fonts in all sheet files, model files, index sheets, borders, and cover sheets for all design work.** See the General Appendix workflows entitled 'Using Text Styles and Drawing Scales' and 'True Type Text User Guide'

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**Scale Factors: Discussion**

A procedural change is in effect for Design Branch’s project design workflows. We will begin using design file borders (title blocks) that have been created at actual sheet sizes, i.e., ANSI D or ANSI E (34”w X 22”h and 44”w X 34”h respectively). A different scale factor must be applied to the ANSI sized borders when referencing to sheet files.

**Scales & Scale Factors**

Sheet Models and Borders in SAJ Workspace are configured using an absolute scale factor. The Use of this scaling method is important to the sheet model layout methodology.

Expressed Scale	Scale Factor	Definition
1” = 1”	1	1 inch to an inch
1/2” = 1’	24	24 halves to a foot
1/4”=1’	48	48 quarters in a foot
1/8”=1’	96	96 eighths in a foot
1/16”=1’	192	192 16ths in a foot
1”=10’	120	120 inches in a foot
1”=100’	1200	1200 inches in a foot

This method then uses the scale Factor to multiply sheet size or border size to achieve a real-world sheet size that will expand to encompass the design feature area. For example, a civil scale of 1”=100’ will use a scale factor of 1200 to multiply a 34”X22” (D) border size to achieve a real-world border of 3400’X 2200’. (34” X 1200=40,800” / 12”= 3400’) (44” X 1200=52,800” / 12=4400’)

When we reference a border file for an ANSI E sheet size that has been set up at the actual sheet size of 44”X 34” a scale factor like that shown above will have to be used in order to enlarge the paper sized sheet model or border to a real-world size such as described in the paragraph above.

**This new procedure will be used for all new projects started. In addition any project that is currently in the design phase but in which no border has been incorporated will be required to use the new borders.** The new borders can be found in Project Wise at SAJ\_EN Workspace\Borders\\*.\*.

This changes how we define and use scale factors for referencing borders and index sheets. The legacy borders use until now were 12 times their actual size. New borders have been created at actual paper sizes, i.e., ANSI D, ANSI E, etc. Also included in the new files that are changing sizes are Index sheet templates, and Cover sheets. This change is necessary in order take advantage and use the use of Sheet Models in our project design documents.

## Appendix B-2

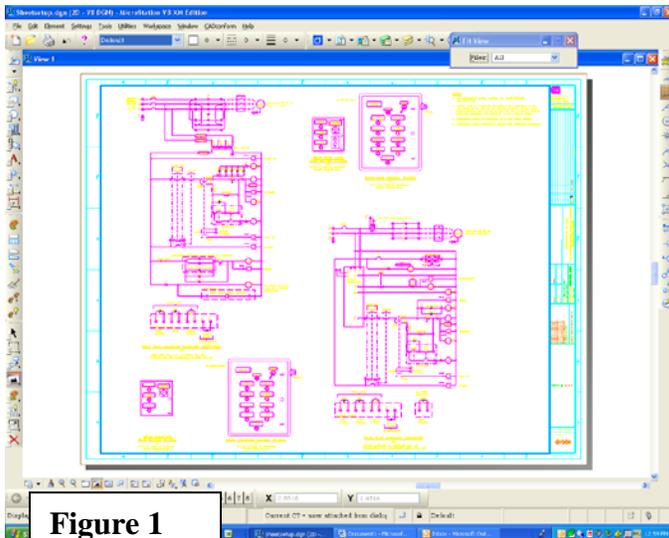
### Plans Preparation Manual

### Scales and Sheet Models

#### **Using Sheet Models**

The new paper sheet sizes for the borders, cover sheets, index sheets in our projects will use a sheet model workflow. The explanation and workflow is explained below.

Sheet models are created by redefining the properties of a Project Sheet File (The defining of an actual scaled virtual paper sheet). The following steps will explain the settings and steps involved in setting-up and using sheet models.



Above, you can see that the file shows the sheet (ANSI E in this case), and is indicated as a shadow box floating above the screen surface.

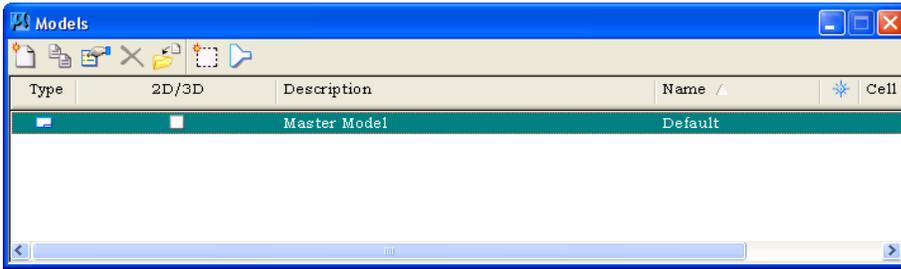
#### **Step 1. Open the Models Dialog**

To access this dialog, select the Models icon from the Primary Tool palette.

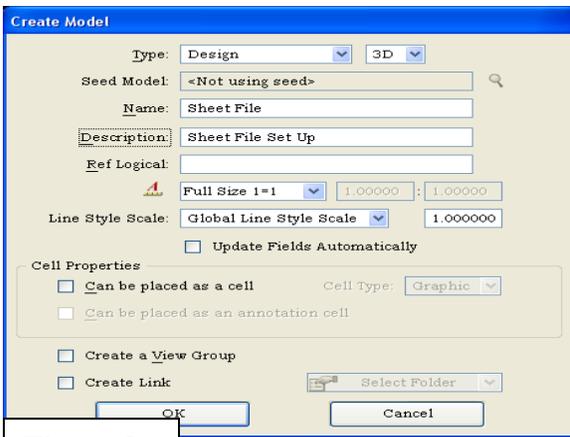
## Appendix B-2

### Plans Preparation Manual

### Scales and Sheet Models



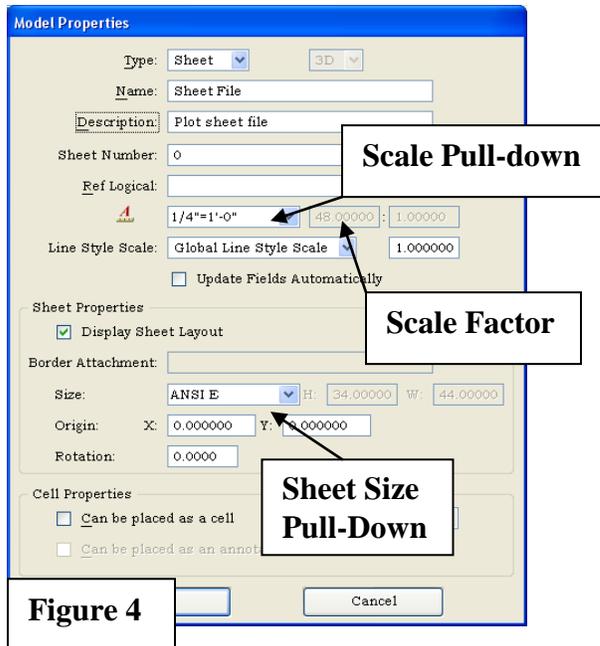
**Figure 2**



**Figure 3**

#### Step 2. Create New Model and Define Properties

(see **Figure 2**) Select the first Icon (Create a New Model) You will initially see the Properties dialog. Set the model parameters. In this case in Figure 3 the Type is set to Design which is the Default model that the user normally sees when viewing a design file.



**Figure 4**

## Appendix B-2

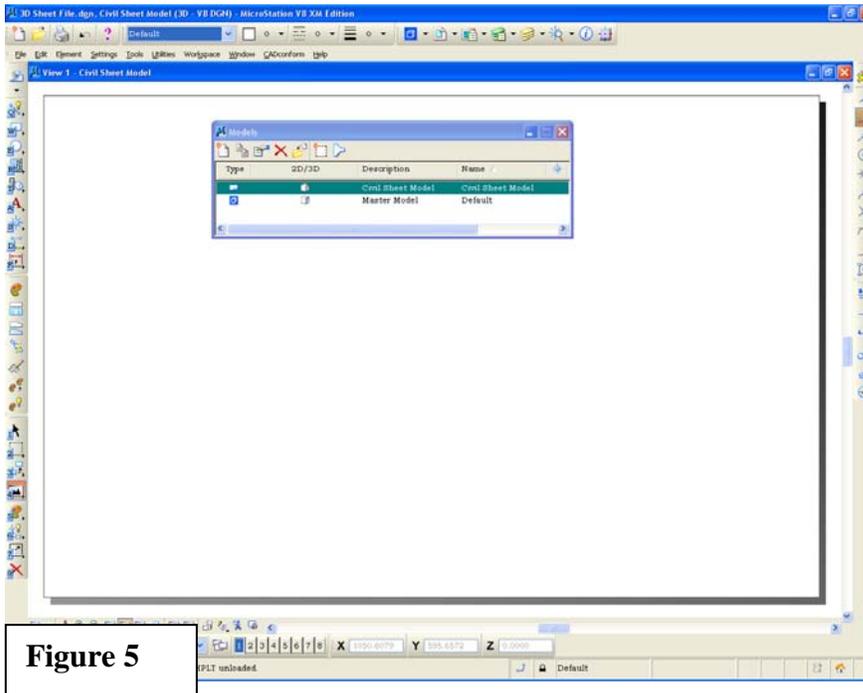
### Plans Preparation Manual

### Scales and Sheet Models

**Step 3 Select the Sheet option from the Type pull-down field in the Model Properties dialog.** This will cause the dialog to expand and more options become available. The initial properties will look like the dialog above. In order to set up the sheet model select Sheet in the Type field pull down box. See Figure 4.

**Step 5. Begin to define the sheet model.**

Following the visual example in Figure 4. Set the Scale by selecting desired scale from the Scale pull down. Note that the scale factor to the left of the 1/4"=1'-0" example has a scale factor of 48.000. *Refer to the discussion at the beginning of this document.* Increasing the scale enlarges the sheet by the scale factor multiplier. For example a 44" wide sheet would become 2,112" or 176' wide after the scale factor is applied.



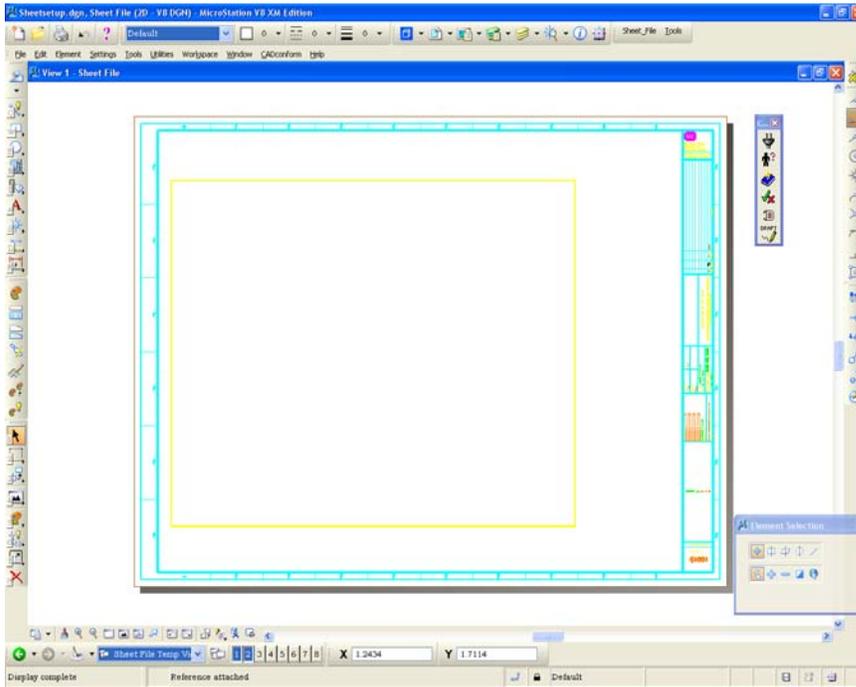
**Figure 5**

sheet model, there are the same size and the same origin. See the sheet model view in Figure 6.

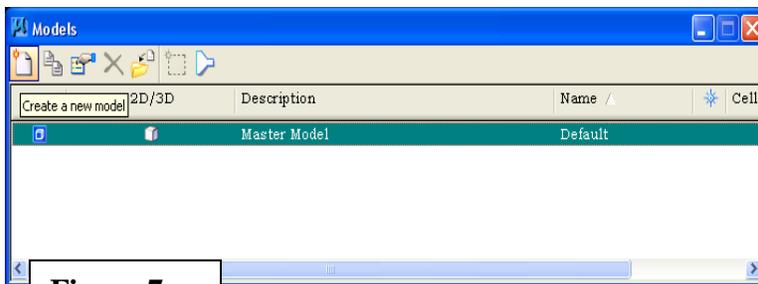
**Step 6. (Non-Civil Projects) Create a new sheet model Reference the Border file to the sheet model**

The sheet model and new borders all share the same lower left corner coincident origin point or X=0, Y=0. Therefore when the border is referenced to the

## Appendix B-2 Plans Preparation Manual Scales and Sheet Models



**Figure 6**



**Figure 7**

For next step for non-Civil project skip to Step 9.

### **Step 7. (Civil Projects) Create new Sheet Model**

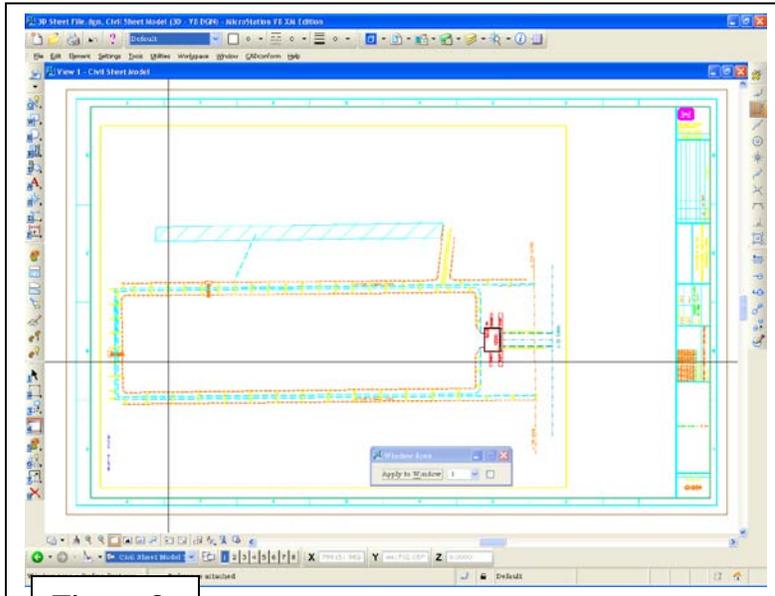
This step assumes that a new sheet file has been created using the standard procedures explained in the **Workspace Information Document** and the **Project Execution Guide**

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### Plans Preparation Manual

#### Scales and Sheet Models

Once the new DGN sheet file is created and opened, select the Models Icon from the Primary Tools Palette. This will show the Models dialog shown in **Figure 6**. From this dialog select Create a New Model as shown. A new model Properties dialog will appear as shown in Figure 3. Change the Type field from Design to Sheet, then select the ANSI sheet size to be used (ANSI D or ANSI E). Note that the model dialog now shows a new model. In this example the model has been name and a description given. This is a good practice in order to keep track of the models created. Once the model is created and the dialog dismissed, the Microstation view will show a white background with a default ANSI D sheet shown when you fit the view.



**Figure 8**

design and border are not coincident with the Sheet Model. In order to correct this issue record the lower left border trim line coordinates. In this example the coordinates are: X=78626.56 Y=440911.42. Next return to the Sheet Model properties and enter these coordinates as the sheet origin as shown in Figure 8.

#### **Step 8 (Civil Projects) Reference the Civil Design Model file to the Sheet Model.**

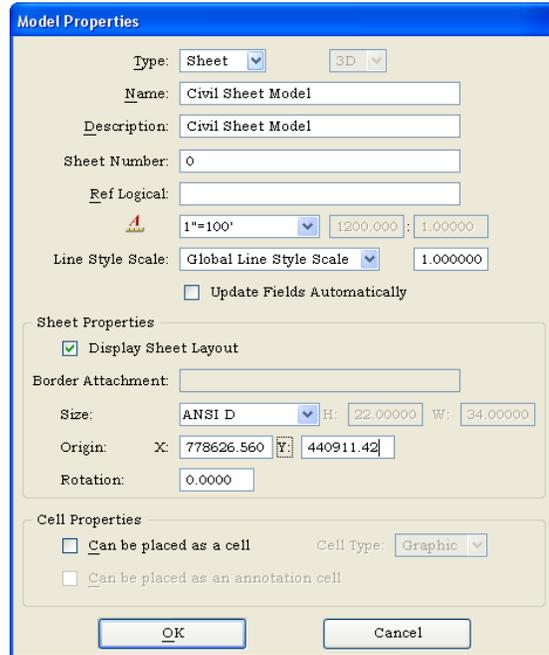
Reference the civil model file to the sheet model. The normal procedure in referencing is used placing the reference as Coincident World as the method of placement. Next reference the Border file as is normal at the appropriate scale sufficient to encompass the Design Model features as shown in Figure 7.

Note the referenced

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### Plans Preparation Manual

### Scales and Sheet Models



**Figure 9**

Now that the coordinates are entered, select the OK button at the bottom of the Model Properties dialog and you will see that the sheet model now shows the sheet and the border are coincident with each other.

The dialog shows the Type is Sheet, the Scale is set to 1"=100', the sheet size is ANSI D, and the Origin is set to be coincident with the lower left origin of the referenced border file. See the result in Figure 9.

The Title Block textual updates notwithstanding, this civil sheet model is now ready to plot.

The user can find plotting procedures in detail in the Appendix A, Batch Plotting Workflow. The routine below however is a short overview of the procedure

#### **Step 9 Plot the Sheet Model**

The drawing file containing the sheet model or the set of project drawings containing the created sheet models can easily be plotted without defining a shape or a fence for each drawing. Simply select the Sheet as the plot method in the plot dialog as shown in Figures 10 and 11.

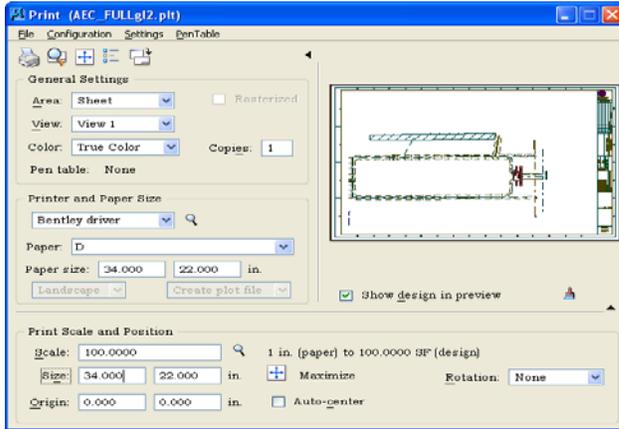
#### **Settings For Single Plots:**

Notice that in Figure 10 under general settings in the Plot dialog that the Area is set to Sheet. Under Printer and Paper Size, Paper is set to D. Print Scale and Position sets the Scale to 100.

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### Plans Preparation Manual

### Scales and Sheet Models



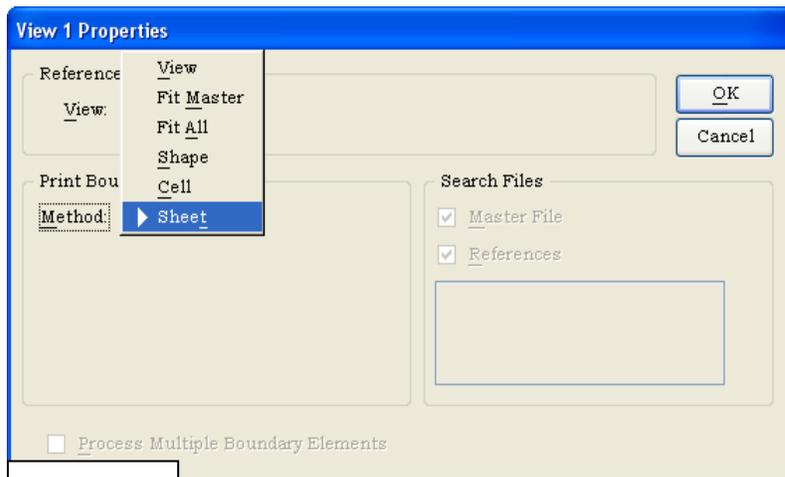
**Figure 10**

#### **Settings For Microstation Batch Printing:**

Notice that in Figure 11, Batch Print Properties dialog, the Print Boundary Method is set to Sheet rather than Shape, Fit Master, Fit All, or View. This method eliminates the need for fencing or otherwise defining a plot area.

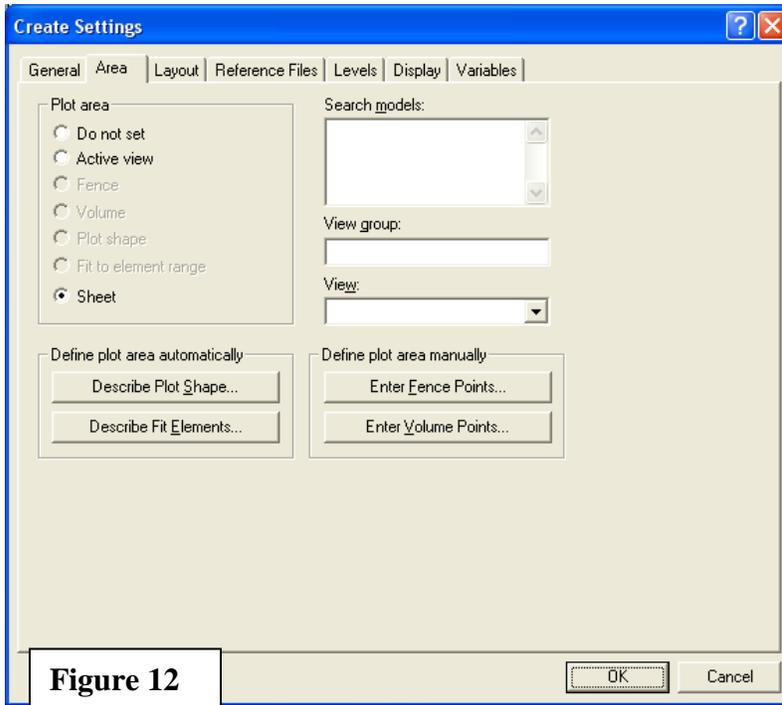
#### **Settings for IPLOT Batch Plotting from IPLOT Organizer**

Select the IPLOT Properties Dialog and then select the Area Tab. Under the Area Tab select the Sheet option rather than Describe Plot Shape as usual.



**Figure 11**

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Scales and Sheet Models



**Final Note**

Contact the Design Branch CADD Coordinator with any questions about this or any other process concerning Branch Standard Procedures, methods or techniques.

## Appendix B-3

### Plans Preparation Manual

### InRoads Project Setup Workflow

#### **Applying InRoads Design and Modeling To Projects**

Civil Designs prepared in Jacksonville District are predicated on design models developed using Bentley Systems InRoads Application. This accounts 30% or more of the District's Graphic design products. Due to the ubiquitous nature of InRoads and the overarching requirement for compliance to Graphic Standards as defined in the A/E/C CADD Standards and the Local requirements for Project Design Product Standards, it seems fitting that a detailed step-by-step workflow be provided to help the Civil designer in the development of models. The proper setup and assignment of model criteria will assure the compliance of graphic attributes to design files (DGN).

#### **How InRoads Preferences and Tools Relates to Standard Workflows**

InRoads is developed to operate using preset configuration (XIN) files, Template Libraries (ITL), Geometry Libraries (Alignments), Roadway Definitions (IRD) files, and the "out-of-the-box" InRoads installation provides each of these files, however they do not meet the corps standard. The CADD Standard team has developed and provided standard compliant versions of these files for the users. This document provides a step-by-step procedure for setting up a project in the InRoads environment that will comply with the standards.

#### **For In-House Users, A-E Contractors and Partnering Corps Districts**

The Jacksonville District has provided a WEB page that contains a complete library of resources for use in preparing project design work for the District. The WEB address [http://www.saj.usace.army.mil/Divisions/Engineering/CADD\\_MmgtSup.htm](http://www.saj.usace.army.mil/Divisions/Engineering/CADD_MmgtSup.htm) Among the information included on the web site are Standard DGNLIB files that provide Text Styles, Dimension Styles, Levels for discipline model files and discipline sheet files. You will find configuration files for Microstation design units. These non-InRoads resources are mentioned because these files are needed in conjunction with InRoads in order for InRoads to interface properly with the design files it is using to develop its models. InRoads resources are also found on the site for download including the InRoads standard compliant XIN file, standard template files. These two files contain all of the defined civil modeling features with assigned standard complaint graphic attributes. It is strongly suggested that the users download these files and set them up in a central location such as the project area on a project server. Jacksonville District users have the benefit of a workspace set up for each project in the Project Wise® (PW) Engineering Document Management System. See Unit 4 "Project Wise Workspace" for the explanation of the PW Workspace and how it works. See Unit 1 "Project Design Execution" for the description of the Project project workflow.

The remainder of this document will refer to the various paths or functions of the design process as defined in the Jacksonville District Project Wise Workspace. For information on how to set up projects in a non-PW workspace contact Pete Kendrick at [Peter.d.kendrick@usace.army.mil](mailto:Peter.d.kendrick@usace.army.mil) or 904-232-1912.

## Appendix B-3

### Plans Preparation Manual

### InRoads Project Setup Workflow

What follows is a Step-By-Step guide to start and develop a civil design in InRoads. There is not an attempt here to train the reader on the technical points of each InRoads tool but rather, a procedure to begin and apply the resources needed for the project design development processes. For detailed InRoads training for specific tools and techniques see the Training Videos on the CADD Management web page.

#### Step 1 Starting Microstation and InRoads in the PW Workspace

- Open Microstation using an InRoads Icon. This will start Microstation and initiate the InRoads application. If you are new to InRoads or if the program is newly install on your workstation. Follow these setup steps below.
  - Select the Tools menu item.
    - Select the Locks menu item.
    - Select the locks tool bar. This places the locks Icons at the top of the InRoads dialog.
  - Select the Tools and then the Application Add-ins menu Item.
    - Select the following add-ins.
      - Global Scale Factor
      - Horizontal and Vertical Element
      - Hydrology and Hydraulics
      - Quantity
      - Thin Random Points
    - These will load once you apply the add-in dialog.
  - Now the General environment is set up that will remain until it is changed by the user or a newer version of InRoads is loaded.
  - Make it a habit to select the Global Scale Factor from the bottom of the Tools menu each time you open InRoads. The scale factor dialog will float on the screen and is relatively small so you can keep it on the screen and active to change scales as necessary. The scale factor will change text sizes when a new value is selected.
    - For example if the scale factor is set to 10 then the resulting feature annotation will be written at 1.25 ft high in the design file. Text heights are calculated from a base text height for annotation text of .125 ft in order to use the simple scale factor to calculate the final height (scale X .125).
- InRoads operates in a Microstation design file environment. The Model you will create using InRoads only depends upon the DGN file when viewing graphics. InRoads configurations assign graphic attributes using a “By-Level” definition from the design file in which the InRoads session is currently running. So, if the current file does not contain the workspace’s by-level definitions, all graphics will be written to the default level without the appropriate color, line style, or weight.

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### Plans Preparation Manual

#### InRoads Project Setup Workflow

- The Project Wise Workspace is dependant upon the dgn files residing in the appropriate PW project directory that has had a Workspace assignment made so that dgn files opened in that folder will have the settings and resources provided for the specific discipline folder. See Unit 3 “Project Wise Workspace” for workspace details.
- When a design file residing in PW directory is opened the file is subject to the workspace resources, including the DGNLIB files that provide the discipline levels, text styles, and dimensions styles.

#### Step 2 Create Project Defaults

- From the InRoads File main menu, select the Project Defaults item.
  - This will open the Project Defaults Dialog that you see below.

From the right side of the dialog, select the button labeled New and enter the new configuration name in the field provided. Once the new configuration is created, the remainder of the dialog can be completed. Select the Preferences (\*.xin) by placing your cursor in the field and then selecting the browse button. Then browse to the location of the Std\_Civil.xin file. For those using the PW workspace, the Civil\Inroads folder will contain this file. Point to that file with the browse button. Next select the Project Default

**Figure 1**

Directory field and the browse button again. Browse to the PW project InRoads Directory and select the OK button. Now highlight and Copy the path to the project InRoads directory and paste it to each field below stopping after pasting the

## Appendix B-3

### Plans Preparation Manual

#### InRoads Project Setup Workflow

Roadway Design (\*.ird) field. Once complete, Select the Apply button and then the Close button.

Step 3 Open the InRoads Survey Files

- Select File > Open > Surfaces
  - Browse the PW file open dialog to the Survey Project, select the appropriate surface file or files and select open. These will be read-only since they are in a survey directory.
  - Open the Survey Geometry Project file if present in the Survey location. (Some survey folder will not contain a Geometry Project depending on the survey contract type and scope.)

Note: The Project Defaults will only allow one path for InRoads Surface, or ALG files so the survey resources will have to be opened without the benefit of saving the path to the Project Defaults set unless the user is setting these paths for Survey files only.

Step 4 Apply the Project Default settings

Once the settings are complete select the Apply button to set the defaults for your project. After applying the settings select the Close button.

Step 5 Open the project files

The user will need to open the surfaces (DTM), geometry (ALG), templates (ITL), Roadway Designer (IRD) if these files exist for the project. Open any Survey Files from the Project Wise Survey Data area as well. If the project is new and models or alignments, templates and roadway designer files have not been created, then the user should rename the standard ITL file to reflect the project name. The ALG and IRD files will also need to be created in none has been created and named for the project as well.

Step 6 Create a InRoads Project File (RWK)

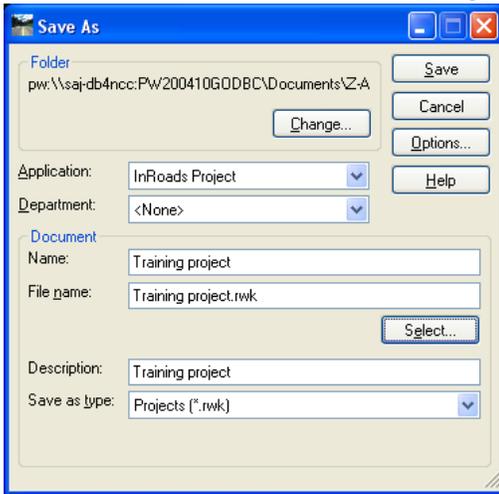
The InRoads Project file or RWK file is a simple text file that InRoads uses to identify the path locations of the project model components such as surfaces, alignments, templates, roadway designer files. When the users creates this file and identifies the components the RWK file will automatically check out and open all of the components when the RWK file is opened from InRoads. Select the Save As from the InRoads from the File menu option and the dialog shown in **Figure 2** will appear.

- Next select the Change button if the folder path shown is not the Project Wise path that point to your project area. If you have set the Project Defaults dialog up correctly it should be correct.
- Next enter the document name, file name and Description.

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### Plans Preparation Manual

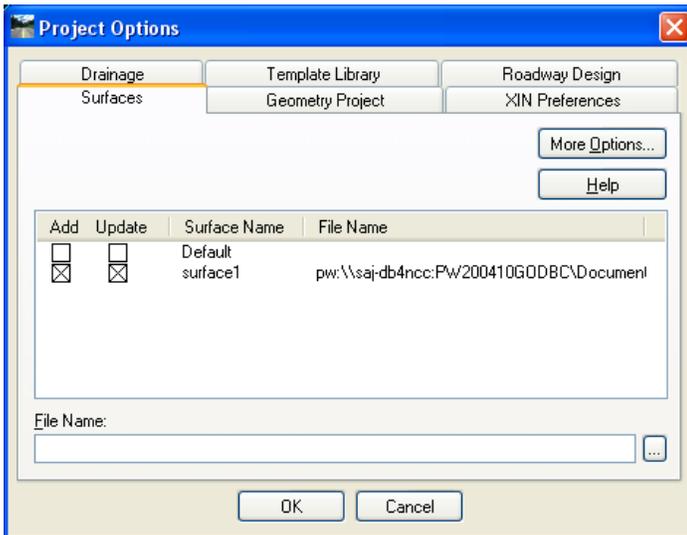
### InRoads Project Setup Workflow



**Figure 2**

- During project development, you will have changed or added information to the project model components and you will need to pull up this dialog to modify the information. If the Project file is not shown in the fields for name, file name and Description, choose the Select button and select the existing file to modify the information.

Step 7 select the model components to Add and Update to the Project File.



**Figure 3**

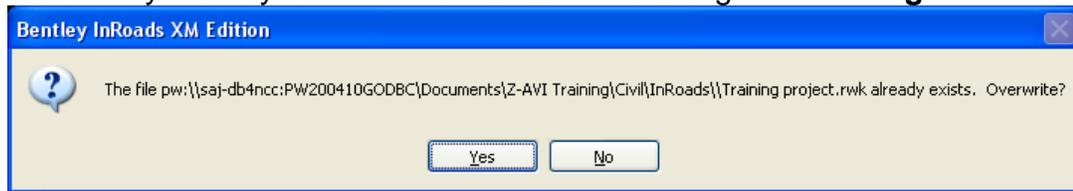
There is also a file name browse button at the bottom of the dialog. The user

can browse to the Project Wise folder and add a file to the tab to save to the Project Options tab.

- Select the Options button
- You will see the dialog in **Figure 3**. The Tabs contain the list of all the project file currently opened in the InRoads Session. The example shows the Surfaces tab open.

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Plans Preparation Manual  
InRoads Project Setup Workflow

- Select the add only box if the file to be opened is to be a read-only file such as a survey file.
- Select the Update box if the file saved is to be a file that will be modified and saved such as the design model being developed.
- Continue the same process for all of the tabs: Surfaces, Geometry, Template Library, Roadway Design, XIN Preferences, and Drainage.
- Once all files are loaded and set for add or update press the OK button.
  - This will return the user to the Save Project File dialog.
- Select the Save button to save the Project file settings. If the project already exists you will see the notification dialog shown in **Figure 4**.



**Figure 4**

- Select Yes if you desire to update the existing project file with the new information.
- Be sure to save and check-in the project file to Project Wise when you are complete.

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### Plans Preparation Manual

#### InRoads Site Development Workflow

InRoads is the primary tool to prepare project sites civil design. All earth work is prepared using the InRoads tools including but not limited to facility site design, canal or channel design, levee impoundment dikes, spoil disposal areas, dredging design and volume work.

Basic elements for successful site development are geometry project files (alignments) (ALG)), existing digital terrain models (DTM), a template library File (ITL). The Geometry file must be created or retrieved from other sources such as a project survey that defines site features such as a center line or a base line alignment. While not required, alignments make orientation to and within the site easier. Templates can be used to define a levee or canal for example and can be placed at intervals along an alignment to produce a model in the form of a triangulated 3D mesh depicting the design shape of the proposed model. The existing and modeled surfaces can be displayed in cross section to show graphically the modeled surface in comparison to the existing surface.

The workflow described below describes the InRoads tools' use in producing basic model and does not pretend to be a comprehensive description of how to model very complicated design work but should provide the reader with a usable workflow to follow in the design process.

#### **Step 1. Open the Standard XIN file.**

The Std\_Civil.xin file is found in Project Wise at: SAJ EN standards\InRoads 8.8 and 8.9 standard\InRoads preferences v8.9\std\_civil.xin. This file is critical to producing design models that comply with the AEC Standard. You can also find the std\_civil.xin file in your Project Wise project folder in the InRoads folder if you have had the workspace setup in your project area in the document management system.

#### **Step 2. Create a new or open an existing Alignment**

Normally there is an existing alignment for the project design model you will be developing. If not, project engineers will determine the alignment, location, points of intersection (PI), tangents, curve data, and elevations. The InRoads designer can easily create the alignments based on the engineering data inputs. The Training videos on the Jacksonville District Web Site describes this process in more detail.

<https://intranet.saj.usace.army.mil/~rwp/cadd/InRoads%20training/InRoads%20training.html>

#### **Step 3. Upload the Survey (existing surface) DTM for use in designing the proposed surface.**

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### Plans Preparation Manual

#### InRoads Site Development Workflow

The user should investigate the existing surface for undesirable points such as spikes or false triangles. The user should also determine the datum for both horizontal and vertical as well as the projection used in creation of the existing surface model. This will be important in the design and construction process to come. From the **File** option in the main InRoads Menu, select **Open**. Normally the existing surface will be a survey dtm file found in Project Wise in the Survey Data project folder area. These files are read-only files. Use caution in copying these survey files to your computer and be careful not to make changes to the files representing surveyed existing conditions.

- View the triangles and rotate the file to check for inconsistencies or 'spikes' in the surface.
- You may want to view the contours to give a good feel for the topographic conditions of the site.
- It may be a good idea to produce a set of cross sections along the alignment length to inform yourself of the surface conditions along the design corridor. This step and associated procedures is "just good engineering practice". Thoroughly investigating the existing data and informing yourself may save time later in the design process.

#### **Step 4a. Develop a model template**

- Develop a Design Template. The InRoads template library contains any developed design templates. These templates define the model shape to be designed much the same as a typical section. The widths and slopes are defined on either side of the center point of the template. Rules can be assigned as to how the template acts when modeling the feature. A standard template library has been created for your use and is located in some common locations for your convenience. If you are designing a levee or waterway for instance, you may want to use one of the standard templates provided in the standard library. You can modify the template points to redefine widths, slopes, end conditions and template behavior rules. Each template point can be defined with symbology that complies with the AEC Standard format. When the Model features are created and viewed graphically, they will display the standard compliant graphics and place the item on the correct level.

See the Create Template dialog below. Notice that all the template points are named these names will be used as digital terrain model feature names in the final model.

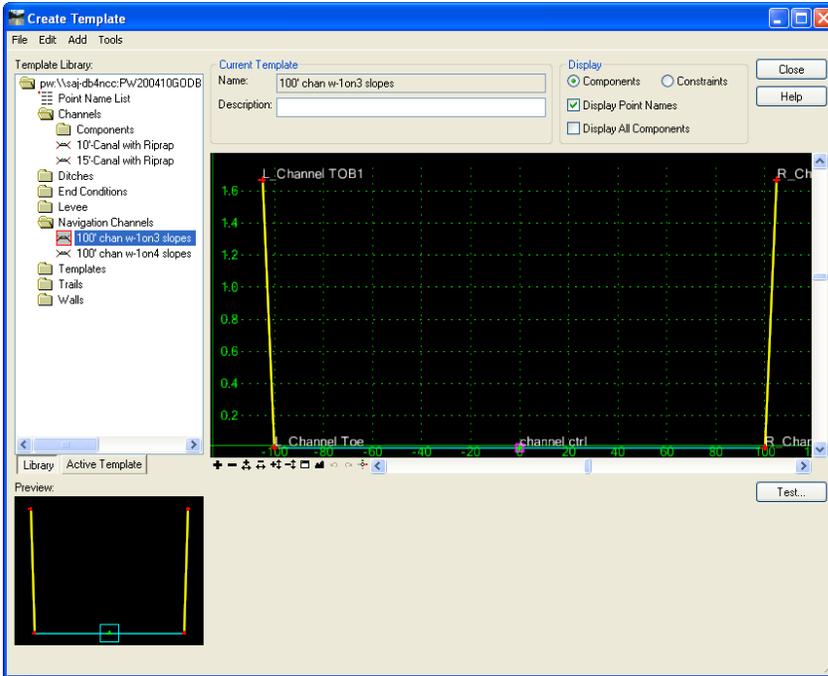
#### **Step 5 Create the Design Model using the Roadway Designer**

Once the template development is completed, you can use it in conjunction with the project feature alignment to model the design template relating it to the existing surface using the corridor modeling tools.

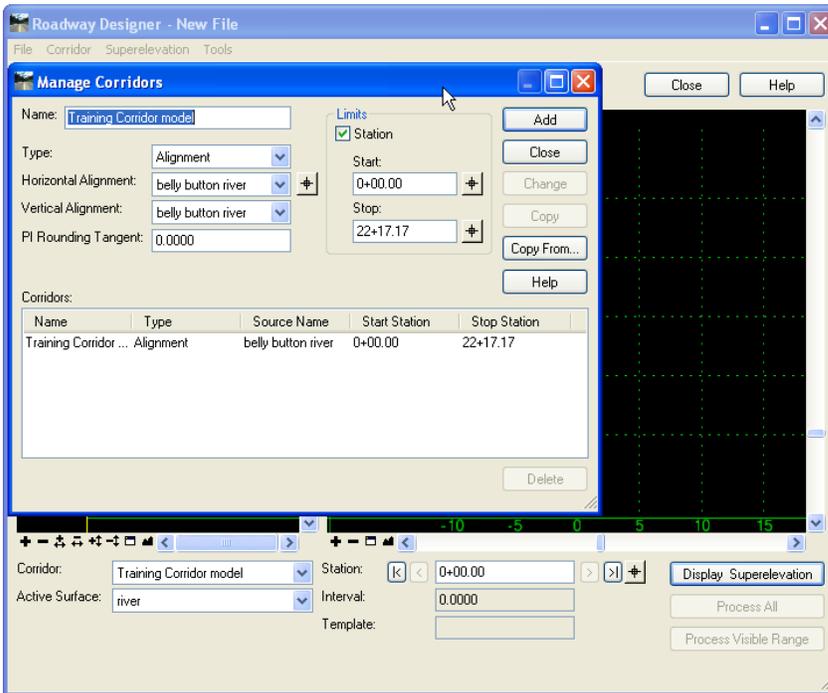
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## Plans Preparation Manual

### InRoads Site Development Workflow



- Develop the Corridor model to define the modeling process. See the Corridor modeling tool below. Notice that the alignment and template used and the distance in station limits are all items to choose when setting up the corridor model dialog.



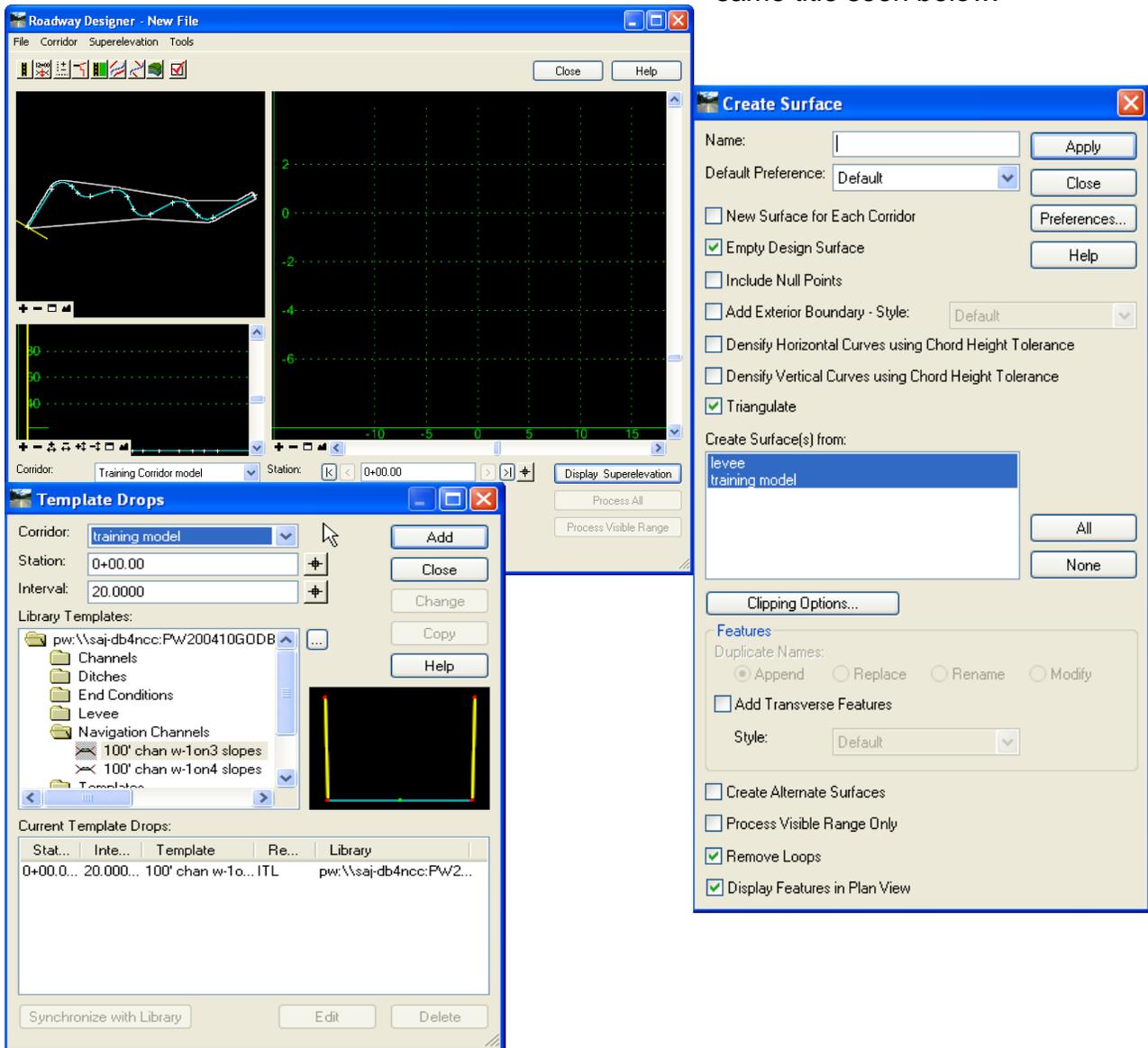
Once these items are selected and set, select the apply button. This will create a Roadway Designer Corridor definition to be used in the modeling process. When the Manage Corridor setup is done, close the dialog. The Roadway designer will displaying the plan view of the alignment, a profile

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## Plans Preparation Manual

### InRoads Site Development Workflow

of the alignment and the surface selected as well as a view window for displaying the active template to be applied. The template will only be displayed after the template drops are defined. (see *the Roadway Designer Dialog below*). The second icon from the left will open the template drop dialog as seen in the Template Drops dialog shown. This dialog displays the Corridor name, station at which the template will be dropped, and a template library window from which you can choose a template to apply to the design model. Once the design components are set, the Create Surface tool can be applied. Find the Create Surface tool on the Roadway Designer icon button bar at the second from the right position. You will then see the dialog of the same title seen below.



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InRoads Site Development Workflow

1. The Create Surface dialog has a minimal number of items that should be applied. The name of the resulting model can be entered or select the New name for each corridor option and the corridor name will be used as the design model name.
2. Empty design surface is prudent to have selected. In cases where more than one attempt to run the model is made. This selection would eliminate redundant features in the design model.
3. Add exterior boundary will restrict triangles from being created outside the design model parameter.
4. Triangulate will initiate the triangulation process immediately following the successful model run.
5. Create Surface(s) from allows you to select which corridors are processed for surface creation.

### **Model is Completed**

Site design is completed. This means that there is now a design model to compare against an existing DTM. This can be done using the volume calculation techniques.

- Triangulated volumes: this is the most accurate comparison between two dtm surfaces. It is calculated using a vertical difference.
- Average End Area volumes: as this method states in its title the area of each cross section indicating the area calculated between the two compared surfaces, adding the next cross section area and averaging the two areas, then multiplying the distance between them estimates the volume. The accuracy of this method depends on a number of factors some of which are, distance between cross sections, variations of surfaces between cross sections, turns in the alignment along the corridor.

See Unit 10 for creating InRoads Volumes.

# Appendix B-5

## Plans Preparation Manual

### InRoads Volume Computations

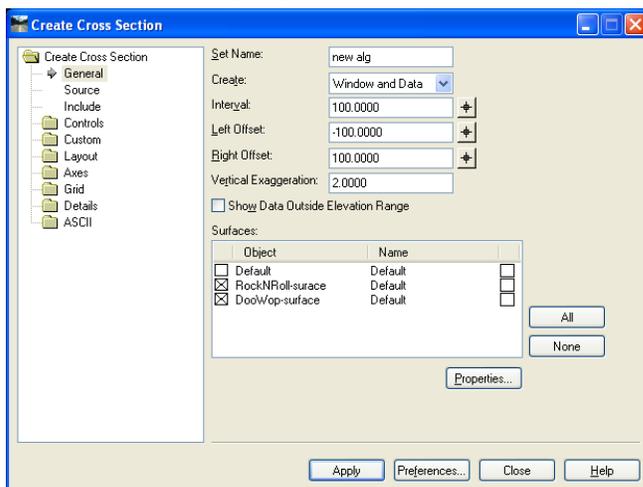
Project design volume computations are produced in two fundamental ways, average end area and triangulated difference.

- The **average end area** computation method depends upon reading the graphic area displayed in Microstation cross sections, calculating the area in the cross sections shown between two representative surfaces. This is done by averaging areas of two consecutive sections and multiplying by the distance between the two sections. This process is continued through the entire selected cross section set to achieve a total calculated volume of cut and fill displayed in cubic feet or cubic yards.
- The triangulated volume method compares two surfaces over the entire area of the surfaces or to the extent of the smaller of the two surfaces and calculates the cubic volume between the surfaces compared. This is the more accurate of the two methods and reports the exact volume difference between the surfaces. The accuracy and density of the data making up the two surfaces is key to the accuracy of the resulting computation. Data density and accuracy is key to accurate volume computations for the average end area method as well. But simply stated, triangulated method of computation is more accurate overall.

#### Average End-Area Volumes Method

##### Step 1. Open and configure the Create Cross Section dialog set up and display cross sections.

Two triangulated surfaces are required. From the InRoads main menu, select Evaluation then select Cross Sections and then Create Cross Sections. This selection will display the Create Cross Section dialog see in Figure 1.



Notice the various categories of settings in this dialog. Once the user sets up the desired format for the dialog the Preferences button at the bottom of the dialog can be used to save the settings to a custom name if desired. The two surfaces to be compared for volume calculation are listed in the dialog Surfaces window. The left side of the dialog lists in

**Figure 1**

## Appendix B-5 Plans Preparation Manual InRoads Volume Computations

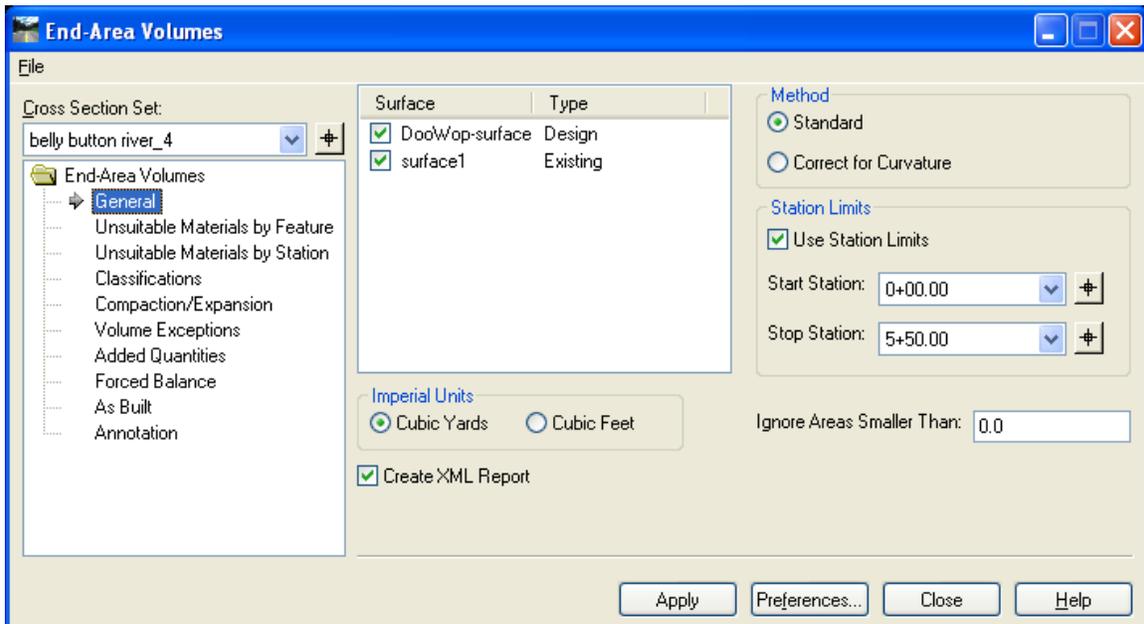
tree and leaf format the items that can be customized to meet the project scale and graphic requirements.

One of the more critical settings for the calculation procedure is the cross section interval defined. Volume calculations can be adversely affected if the interval is too great because of variation in the alignment upon which the cross section set is cut. Many curves or the degree of changes in alignment angles will produce skews in the comparative cross sections. Distances used in calculation of the average end area will be misrepresented between two skewed sections introducing errors into the resulting volume.

Once the items are configured, select Apply at the bottom of the dialog. Once selected, the prompt will request that you identify a location to display the cross section set. The point will identify the lower left corner of the cross sections.

### **Step 2. Open End Area Volume dialog**

From the main menu select Evaluation > Volumes > End Area Volumes. This will display the Dialog seen below in Figure 2.



**Figure 2**

Note that the Tree and leaf display on the left side of the end area volumes dialog. There are a few items in this list that need attention as a general rule when ever you choose this method of volume calculation. First from the general item be sure that the proper surfaces are selected to compare.

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- a. The **Unsuitable Materials** items define portions of surfaces that are unsuitable materials to be used as fill, for example. These can be defined as boundaries of defining features or by station limits to a defined depth(s).
- b. The **Classifications** item would List surface components of unsuitable materials or itemizing sub surface features.
- c. The **Compaction/Expansion** factors are provided by the Geotechnical engineering studies and can be used to better define volumes.
- d. The **Forced Balance** is set up to or between stations. A balance factor is calculated between stations where forced balance is applied. The balance factor is the accumulated fill divided by the accumulated cut up to the given station. If the forced balance is applied to cut, the adjusted cut volumes up to that station are multiplied by the balance factor. If the forced balance is applied to fill, the adjusted fill volumes up to that station are divided by the balance factor. At the forced balance stations, the accumulated cut and fill are reset to zero.
- e. The **Annotation** item is used to define the cross section automatic annotation of volume displays. The user can define custom fills for cut and fill shapes shown in the cross sections and annotate them. The style and look of the annotations can be modified to make the information more readable.

Select the Apply button to produce the volume report. You should have previously set the format readout for cubic feet or cubic yards and selected the create XML report. If a default end area report style sheet has not be selected prior to running the volume report, a dialog will send notification of the need to select the report style sheet and provide the dialog to choose the report form.



**Figure 3**

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## Plans Preparation Manual

### InRoads Volume Computations

#### Step 3 Select the Report

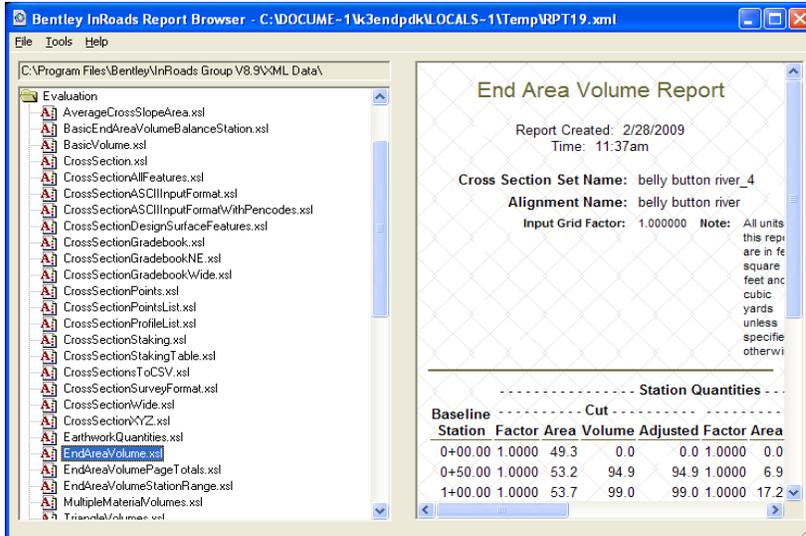


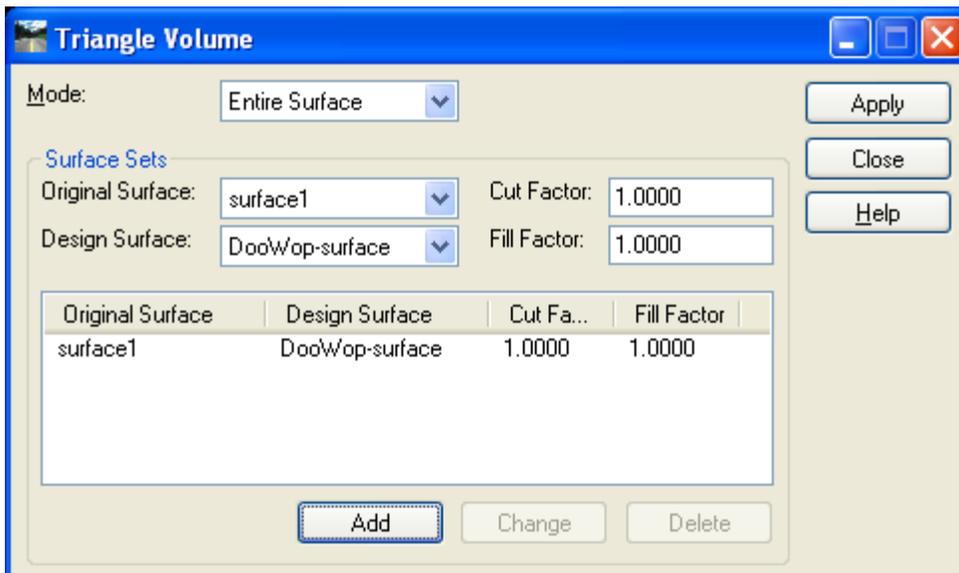
Figure 4

Figure 4 shows the dialog to choose the default report format. Right click on the report desired and select it as the default.

Finally the report will be generated.

#### Triangulated Volume Calculation Method

##### Step1 Open the Volumes menu and select Triangle Volume.



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**Figure 5**

The Triangle Volume dialog provides pull-downs to select the Original and Design Surfaces. Once the two surfaces have been chosen, select the Add button. The Cut and or Fill Factors can also be defined.

The Mode of calculation is most commonly Entire Surface as shown in Figure 5, but a fence or shapes can also be used to define the area to be calculated in the volume computation.

The difference between the surfaces is defined vertically. In other words if the design surface covers an area less than that of the existing surface then the vertical difference in the limits of the smaller area will be calculated.

**Step 2. Produce the Volume Report**

Select Apply from the upper right of the Triangle Volume dialog. The message that was displayed in figure 3 will display unless you have already selected the default Triangle Volume report you want to use as the default report form.

Once define, the report will appear.

Both End Area and Triangle report are displayed in XML format and can be saved as the same or to HTML file types. HTML report can be redisplay in any web page later for review. The save as dialog will allow you to save the report(s) to the project area in Project Wise for future reference.

## Appendix B-6 Plans Preparation Manual Referencing Microstation Files

Referencing Microstation files is a standard occurrence in our preparation of project design documents. We use a sheet file/model file environment which make referencing mandatory. There are however some procedures that may not be clearly understood by all CADD users. Below are procedures and depictions of dialogs and setting useful in using the Microstation referencing tools.

**There are two basic categories of referencing workflows with Microstation, design file and raster file referencing.** These referencing procedures are only similar in that they both are attached to the active design file through a referencing dialog.

- **Design reference files** are files that are the same or similar in format to Microstation design files and can be attached coincident to the active file or placed interactively in any location the user chooses. This type of reference can be AutoCAD or Microstation design files.
- **Raster reference files** are files that are rasterized or an organized group of pixels that represent an image of the subject. This type can be a photograph, a scan of a document, or a PDF file, for example.

The workflows below describe the process of referencing both design and raster files.

### **Method 1. Referencing Design Files:**

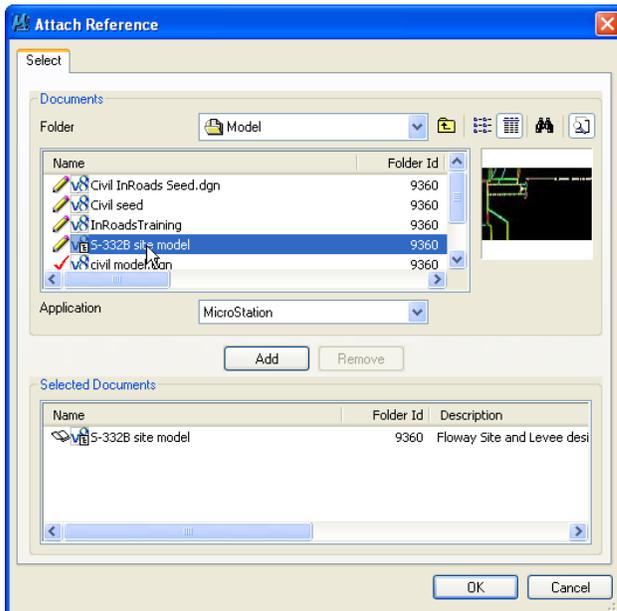
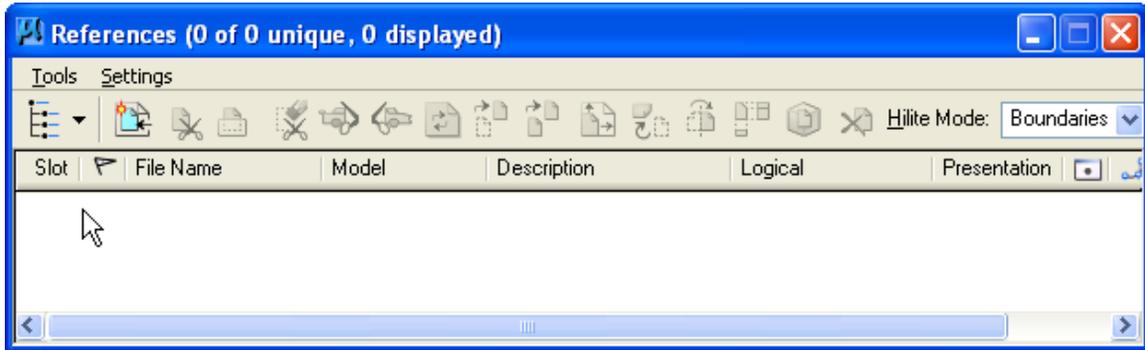
#### **Step 1:**

- Start Microstation and open a dgn or a dwg file. Determine whether the active file contains an actual geospatial coordinate location.
- Locate the dgn or dwg file that will be attached to the active design file. Open the References from the main Microstation pull-down menu. You will see the dialog shown here. There are associated icons for each reference menu pull-down item. Take the time to familiarize yourself with these icon as they may improve you production time using the reference tool in both attaching referencing and performing maintenance work on the files such as clipping boundaries, moving, rotating, masking, and detaching to name a few tools available.

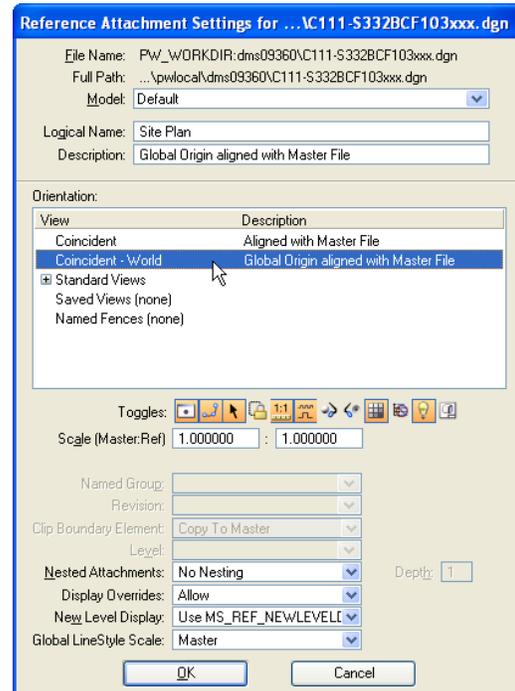
**Step 2: From the pull-down menu, select Tools>Attach or from the first listed icon, select Attach reference file.** This will take you to a browse window. Because we perform design work in Project Wise, you will see the Project Wise window appear.

- Browse to the appropriate folder and select the file to attach as shown in the dialog below.

# Appendix B-6 Plans Preparation Manual Referencing Microstation Files



Once the project folder and file have been selected and added to the selected documents as show here. Select the OK button.



### Step 3. Select the Reference Attachment Settings.

The Reference Attachment Settings will be displayed. See *Reference Attachment Settings* above. Note the top of the dialog displays the folder and file name to

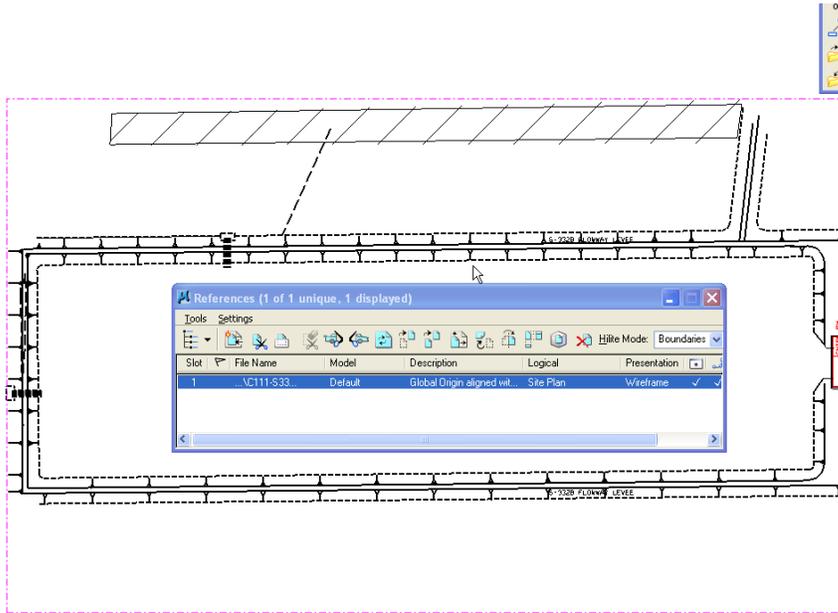
## Appendix B-6 Plans Preparation Manual Referencing Microstation Files

be attached as well as the Logical Name field. It is critical that the user populates this field.

- Use IPLOT to produce project document plot sets. Successful and quality presentations will rely upon the **reference file logical** name to produce tailored plots results. For example, survey site files that are required to be screened or faded in appearance, will be accomplished by calling the logical name for every referenced instance of that survey site plan file. This is done through IPLOT Pen Tables.
  - Next notice the **Orientation** field in the reference dialog box. In the example Coincident-World is selected to insure that the active and the reference files are coincident with each other geospatially.
  - If for example, you were referencing a Title Block, detail or section to the sheet file you would select a Standard View or a Saved View from the Orientation window. Then you would be required to actually place the reference location in the active file. In this case you would want to consider the scale factors shown in the field of the same name.
  - Next turn your focus to the lower portion of the dialog. You will notice fields for Nested Attachments, Display Overrides, New Level Display, and Global LineStyle Scale.
  - **Nested Attachments** determine whether you choose to see referenced files that are attached to the file(s) you are attaching to the active design file. The nested level regresses further with the higher nested level numbers chosen.
  - **Display Overrides** allow the reference files level override definitions to be retained in the reference attachment.
  - The **New Level Display** is a variable that allows the reference to display its own levels in the level manager.
  - **Global LineStyle Scale** provides the choice to retain the reference linestyle settings or adopt the master file's settings or to honor the settings in each file.

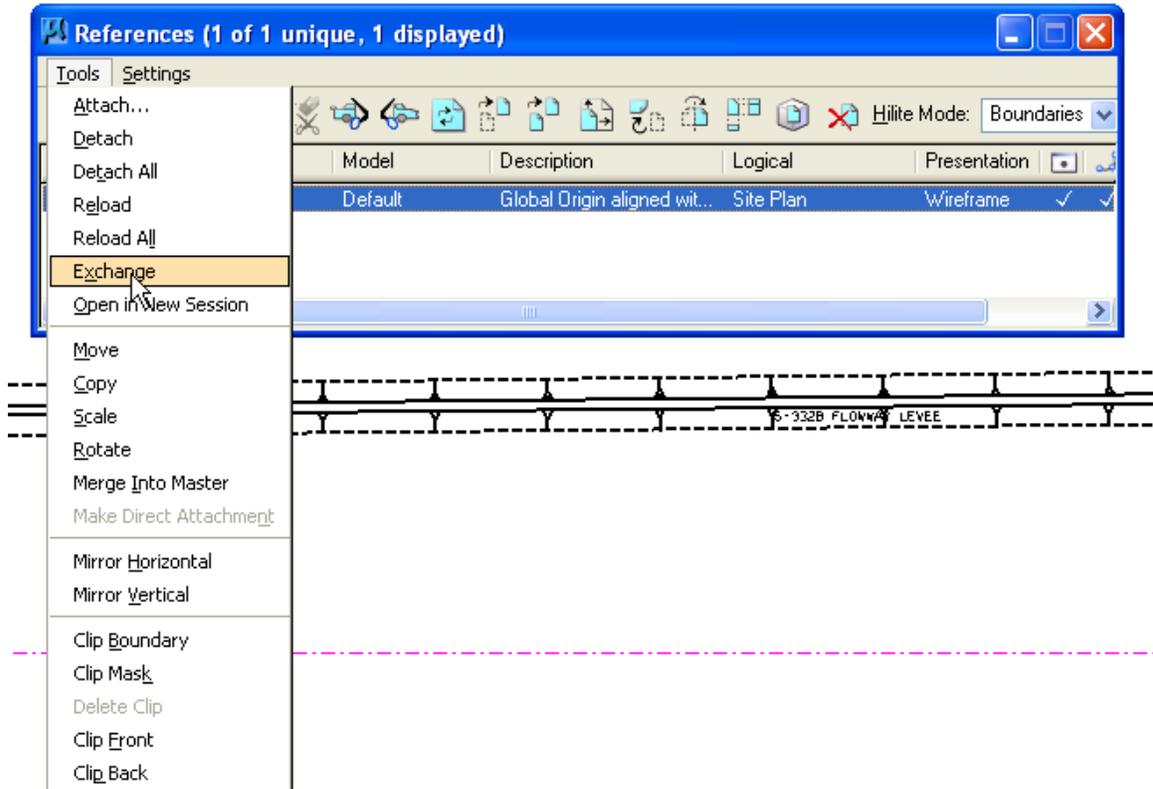
**Once the settings are selected as required, select OK to attach the reference to the active file.**

## Appendix B-6 Plans Preparation Manual Referencing Microstation Files



The figure shown below has been attached with Coincident World attachment selected. The File is attached in the active blank file as shown below. The referenced file is shown below listed in the dialog. From this point the boundaries of the file can be clipped, the file can be scaled, levels can be manipulated, etc. Notice that the logical name given at attachment time shows up now in the dialog.

## Appendix B-6 Plans Preparation Manual Referencing Microstation Files

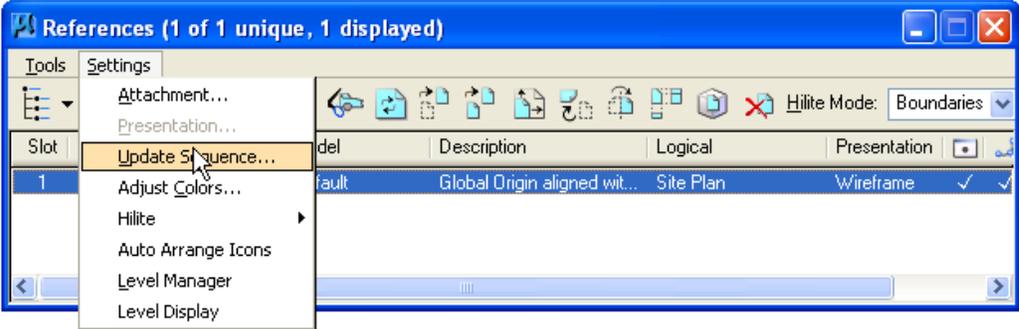


**Step 4. Select Reference Tools to modify the reference attachment.** Below are described additional reference file manipulation tools. *Refer to the figure above shown with the tool menu item opened.*

- The **Exchange** option is highlighted. This option will check out the active referenced file and open it as the current design file. This will allow for some minor design file changes noted after the file is attached. Once changes are made, opening the previous file will allow for the check-in of the “exchanged” file and the sheet file will then present the changes made to the reference file.
- **Open in New Session** will open the selected reference file an new instance of Microstation and allow for edits also. This will not prompt for check in of the current file. Therefore, once changes are made, the original reference file attachment will require refreshing in order to see the updated changes.
- **Merge Into Master** will actually copy all of the reference file elements into the master file and then detach the that reference file. Note: DO NOT copy model file elements into the sheet file. Model file and sheet file elements must be kept separate.

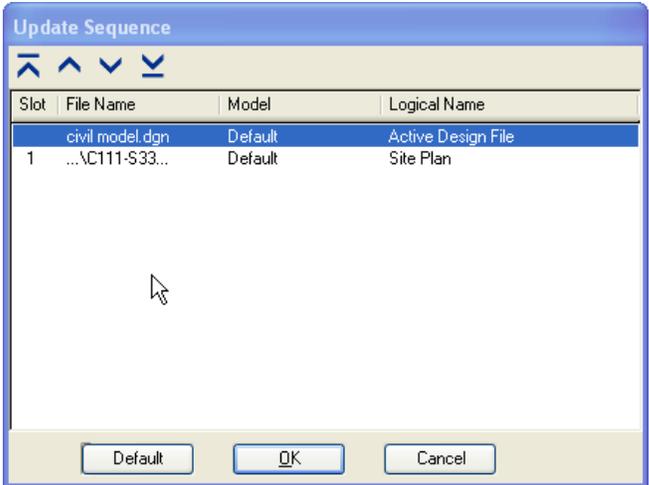
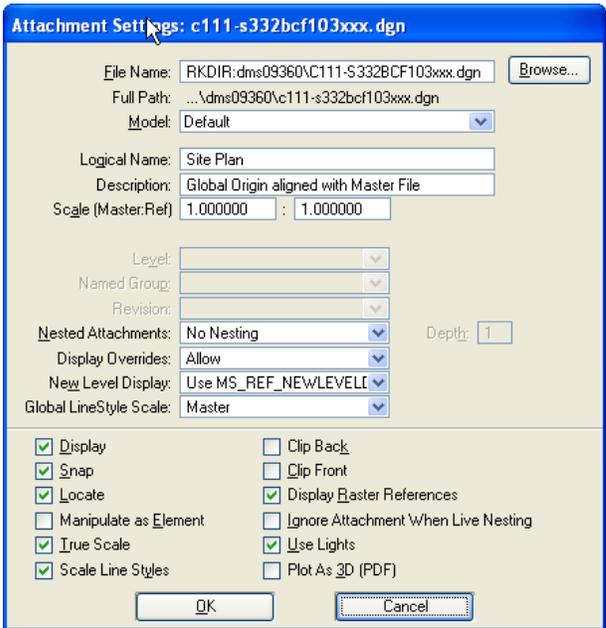
Other items in this dialog are fairly obvious as to operation and similar to the active file Microstation> manipulate element tools

# Appendix B-6 Plans Preparation Manual Referencing Microstation Files



- The dialog above shows the Settings Menu. First we will discuss the Attachment menu option. The Attachment option shows a dialog almost

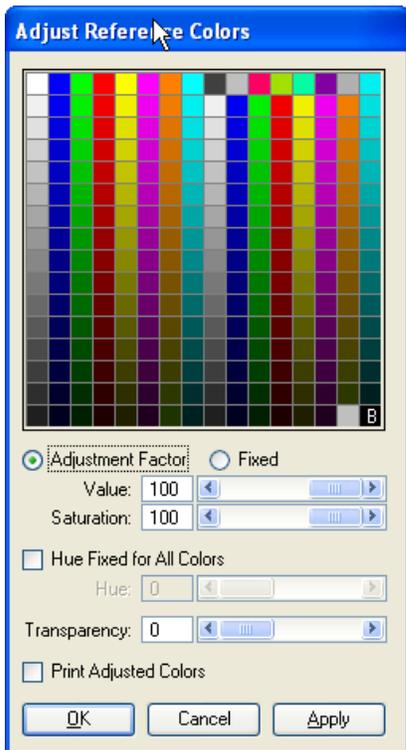
the same as the original attachment dialog but with +the additions of the attachment manipulation settings shown at the bottom of the dialog as set during attachment either by default or specifically by the user. The settings can be changed in this dialog and changes will be evident in the live attachment immediately.



## Appendix B-6 Plans Preparation Manual Referencing Microstation Files

The next option is the Update Sequence. The update sequence allow the reording of the display of the active and reference files. This can be useful if there are element that the user requires to be displayed above other elements to improve readability.

Next the Adjust Colors option is shown. The user can readjust the reference color display to improve displayed elements or the plotted display when plotting in color. The color table display is show that will allow each color to be redefined See the example below.



This can be a very powerful tool when producing presentations for projects. However this is not of much value when producing contract documents that are plotted with black vectors and text.

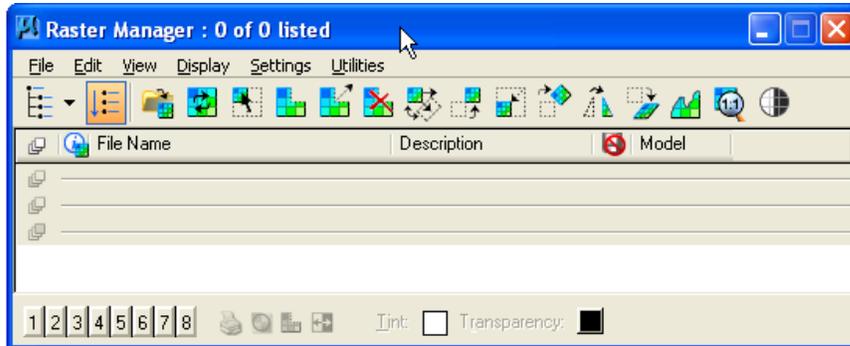
Next the Highlight option allow you to highlight the boundary or the entire reference file or not highlight at all. You may find it convenient to turn on the boundary option to see the selected reference boundary for you awareness if for no other reason. The remaining options are self explanatory.

### **Referencing Raster Files** **Option 1 Geo-referencing Imagery** **Step 1.**

Open Microstation in a file which will contain the desired raster attachment.

## Appendix B-6 Plans Preparation Manual Referencing Microstation Files

Select from the Microstation File menu Raster Manager. This will open the reference dialog as show below. Note the similarity to the Design Reference Dialog.



### Step 2. Adjust the raster view

Like the Reference Manager, the Raster Manager can manipulate raster files performing functions such as rotate, scale, clip boundary, clip mask, etc. The display can be modified in additional ways however such as adjusting the gamma (brighter or darker) changing contrast, etc. Gamma adjustments to brighten the raster image that in effect washes out the image make design files text and vectors much easier to read. A standard gamma adjustments is 3.0. This will allow both gray scale and color plots to be satisfactory in presentation for readability.

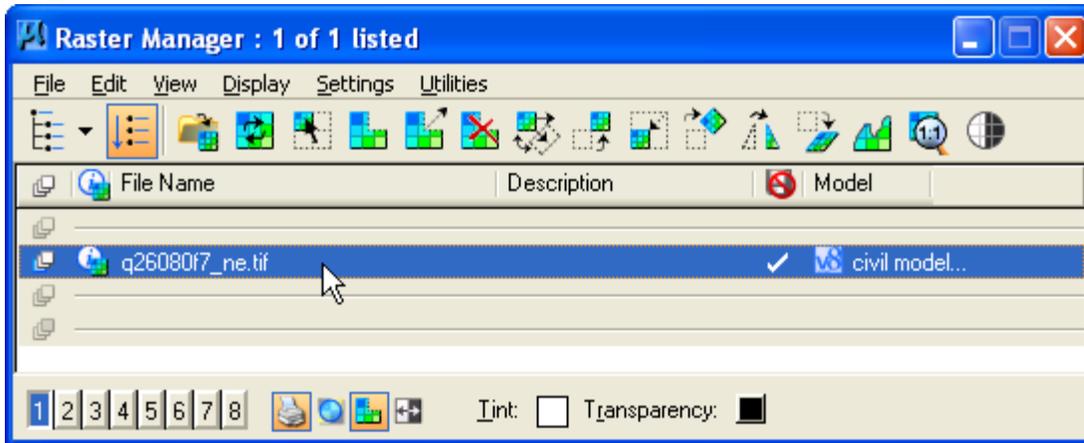
**Step 3. Check Geo-position of raster file.** Many raster files are accompanied by World files. World files are text files that define the pixel size, resolution, and position of the origin point and is commonly expressed in XY coordinates. If Microstation raster preferences are set correctly the world file should correctly position and scale the raster image in the design file. Other raster files come from the sources with location, resolution, and scale information contained in the header of the raster file.

Occasionally even though a world file or sister files accompanies the raster the location is still incorrect. Most common faults are incorrect Microstation raster manager preference settings. If the following procedure proves unsuccessful call the CADD Coordinator.

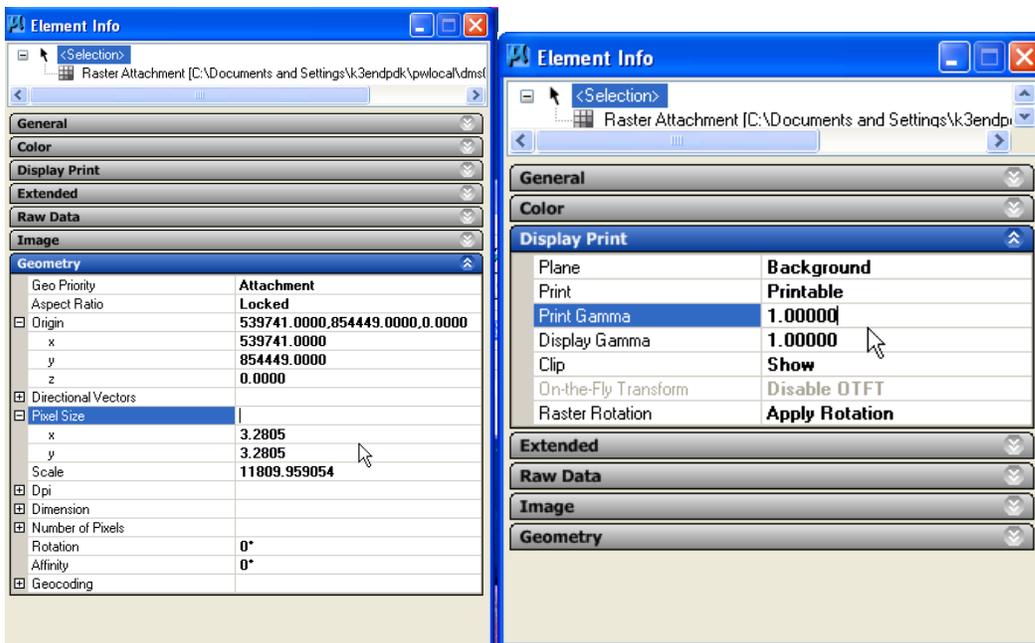
Some raster types use differing points of origin. JPEG and TIFF files, for example locate the origin at the lower left corner of the lower left pixel. SID files use the center of the upper left pixel as the origin. The file type is important in beginning to modify positions of files.

# Appendix B-6 Plans Preparation Manual Referencing Microstation Files

1. Select Attach from the File menu pull-down the raster file



2. Double-click the desired reference file to display the attachment settings dialog as shown below.



### Step 3 Set the Geometry location and Display

Two of the most important raster reference setting dialog displays are shown above. On the left you see the Origin settings and Pixel Size fields. A quick sanity check can tell the designer if the location (state plane coordinates) are

## Appendix B-6 Plans Preparation Manual Referencing Microstation Files

reasonable. If for example the file was displaying coordinate that are much greater than reasonable (perhaps a metric coordinate), check the coordinate by dividing the number by 3.2805. If the resulting figure is in keeping with the actual location of the site, then the field displaying the X and Y can be repaired by placing a forward slash ( / ) after the each field X and Y, and then entering 3.2805. This will in effect reduce the entries by dividing by 3.2805 correcting the entry.

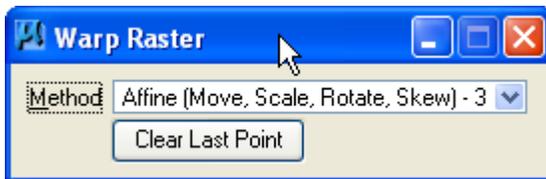
The pixel size is also located below the origin that will display a single pixel dimension in the example the dimension is 3.2805 which means that the resolution is 1 meter. On the right you see the Display Print fields. For most aerial photography a print gamma of 3.0 is sufficient. This setting will lighten up the image to allow black vectors and text to contrast against the background of the photo image.

**Step 4. Warp raster images to fit a dgn file plan.** Imagery that has no geospatial positioning but does correspond to an existing site plan for instance can be resized and/or stretched to fit the site plan. To perform this stretching or **Warping** of the image, first identify a number of points common to both the image and the dgn site plan. For example choose building corners, street intersections, survey bench marks shown on both the dgn as well as the image file. Six or more points are preferred in order to make an accurate fit of the raster on the dgn file.

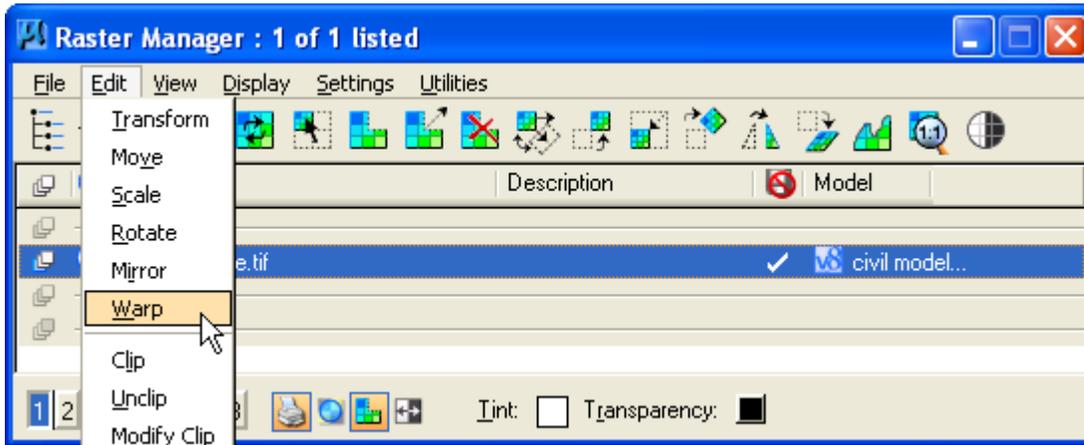
NOTE: If warping points are close together the area in and around will be more accurate but the further away from the position points the greater the inaccuracies will be. It is like

stretching a rubber sheet from the middle; the outside of the sheet is not much affected by the internal warping of the sheet.

The different methods of warping are Affine, Similitude, and Align. To warp an image to alignment with a geospatial design file, choose Affine from the Warp Raster dialog. The routine will ask you to choose image points to match with the dgn points. Once choose points routine is complete, select the reset or right mouse button and the raster image will be redisplayed in its new position.



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Similitude is similar to the Affine method of warping except the similitude method can use as little as two points where the Affine method must have a minimum of 3 points. The Align method is just used for resizing and aligning to another object.

# Appendix B-7

## Plans Preparation Manual

### True Type Text User Guide

True Type Format Implementation Effective Date July 20, 2009

All new project starts shall use True Type fonts for all text usages in project documents. (See the matrix below for the application of fonts.)

Who is required to use the new format? In-house project teams, Districts brokering project design documents, AE design firms, and survey contract firms.

Resource locations: All project resources are provided in order to implement the True Type fonts. These resources include Borders, Cover Sheets, Index Sheets, Location and Vicinity Map files, Companion Cell Library, CADconform files, and DGNLIBs. Project Wise contains all resources for in-house users. The District CAD Resources WEB page contains all resources for outside contributors to project production.

Resource Definitions:

**Cover Sheet, Borders, Index sheet, Location and Vicinity Map files (including the Optional Index file)** These files are not significantly different except for the use of True Type fonts (Arial and Arial Black). The exception is the Index and Optional Location and Vicinity Map. The format for these files has been edited to reduce the redundancy of project information shown on the cover sheet. The optional location and vicinity map file incorporates a single column index for small projects that contain a small number of sheets but also has room for the location and vicinity maps as well.

**Companion Cell Library:** The companion cell library contains all of the elements from the Border Companion DGN file formally used but has been converted to graphic cells and text conforms to the True Type format. Any of these graphic cells inserted into a design file will assume the current level and attribution assigned to the active level. A text cell can be placed and used to expand the text included or use it as a tool for matching text attributes.

**CADconform files:** CADconform and its resources are controlled by a set of databases (one for each discipline). These databases and attached tables define the drafting tools and compliance checking tools. These databases have been modified to include the True Type font definitions.

<sup>1</sup>**DGNLIBs:** DGNLIBs are design files that may include Levels for each discipline, Text Styles and Dimension Styles. These DGNLIBs set file formatting for users

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<sup>1</sup> Corps of Engineers only.

## Appendix B-7

### Plans Preparation Manual

#### True Type Text User Guide

through the application of the Project Wise Workspace. The DGNLIBs for Text Styles and Dimension Styles are also configured with True Type fonts. The Jacksonville District Project Wise Workspace provides the resources for all of the resources listed in the definitions included here.

#### Using True Type Fonts:

1. All design file text will be prepared using the specified True Type (TT) fonts as listed in the table below: (Text sizes are calculated by multiplying the base text size by the Plot Scale (P.S.)

Text Usage	True Type Font	Text Size X P.S.
Cover Sheets Contains a mix of:	ARIAL BLACK & ARIAL	Varies (edit text in cover sheet)
Index Sheet Title Text	ARIAL BLACK	Text in sheet provided
Index Sheet Drawing Listings	ARIAL	.01 X P.S.
Title Block Project Title Text Title Block Sheet Title Text	ARIAL BLACK	.0146XP.S. .0116XP.S.
Title Block Drawing No. Block Text	ARIAL BLACK	.3XP.S.
General Text	ARIAL	.01XP.S.
Sheet and Model files: Headings and Subtitles such as PLAN or Section	ARIAL BLACK	.0116XP.S.
Sheet and Model files: Notes with leaders and dimensions	ARIAL	.01XP.S.
Sheet and Model files: Stacked or Columnar text (schedules, general numbered sheet notes)	ARIAL	.01XP.S.
Hydrologic text (flow indicators, slope symbol text).	<i>ARIAL w/22 DEGREE SLANT.</i>	.01XP.S.
Water Body Labels, Cut Lables	<i>Arial Black w/22 DEGREE SLANT</i>	.0146XP.S.
Range Text, Channel Station Text, Water Elev. Text	<i>ARIAL With 22 Degree Slant</i>	.0116XP.S.

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### Plans Preparation Manual

#### True Type Text User Guide

2. The Project Wise Workspace is configured to utilize Cover Sheets, Index Sheets, General Information Sheets, DGNLIBs and Companion Cells with the True Type fonts set correctly for your use.
  - a. Users can use the Match Text tool to set the font attributes from the companion cell attached or copy text into the current design as is done currently.
  - b. No mixing of Bentley fonts and TT fonts is allowed.
  - c. Some legacy files used as references will require converting to True Type fonts. Contact the CADD Coordinator for help.
3. CADconform databases have been updated to define TT font usage for all disciplines.
4. The InRoads XIN Configuration file has been updated to define TT font usage for all named symbology annotation texts.
5. For any usage not already set up for TT fonts, Use the table below as a cross-walk to define which TT font is defined to replace existing Bentley or legacy Corps fonts.

<b>Legacy or Bentley Fonts</b>	<b>True Type Font Substitution</b>
Corp Font #8	Arial
Corp Font #9	Arial 22 degree slant
Corp Font #10	Arial
Corp Font Corp Bold	ARIAL BLACK
Bentley Low Resolution Filled	ARIAL BLACK
Bentley Compressed	ARIAL BLACK
Bentley Engineering	Arial
Bentley Working	Arial
Bentley #23 Italics	Arial 22 degree slant

6. When replacing legacy font for use in sheet files and model files, be sure to turn on the use of fractions and slanted text where appropriate.

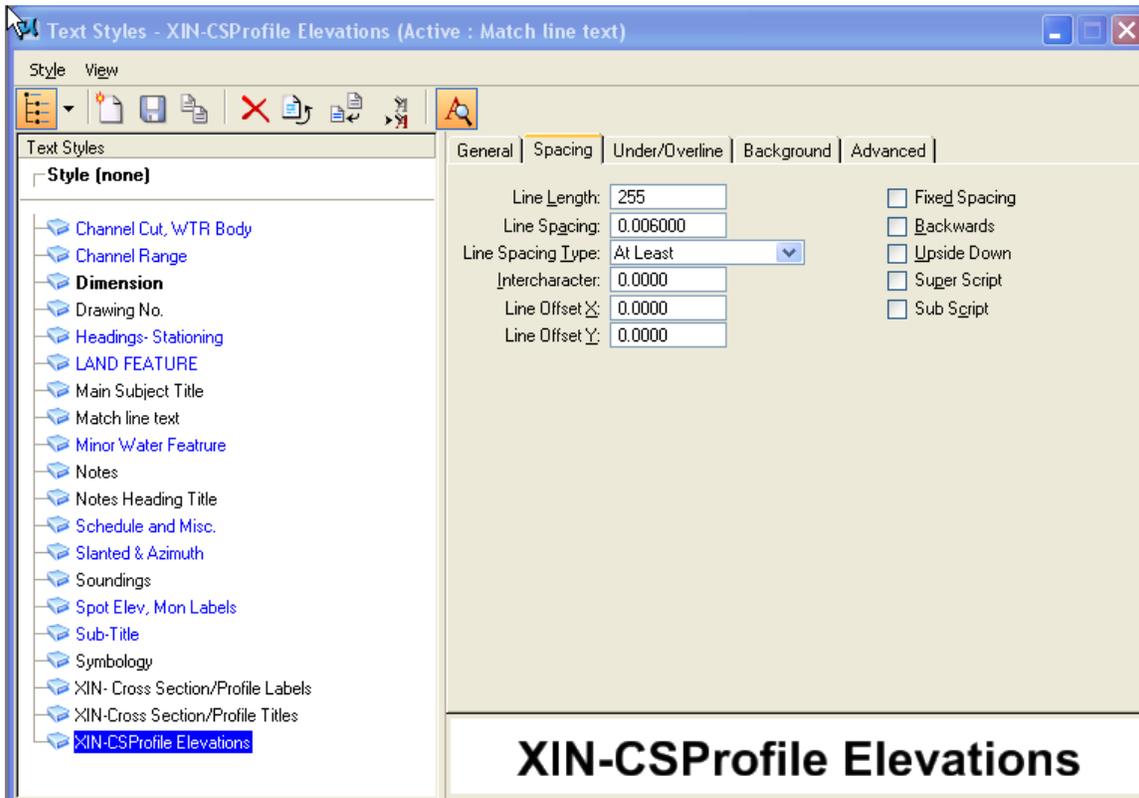
### Text Style Usage

Using Text Styles will take the complication out of design file development. Below you can see the Text Styles created in the Text and Dimension Style DGN Library delivered to all Project Wise folders and files with a Standard Workspace attached.

# Appendix B-7

## Plans Preparation Manual

### True Type Text User Guide



Above is a listing shown of all current Text Styles. These styles are named for the category of text usage that may be needed. Each also has specific settings that include a font name, base text height and width, slant angle if any, justification, line spacing, underlining if required, and background block-out. The explanation below explains these settings.

Note: there are more style shown in the dialog above that are listed in below in example tables. The tables below are for explanation purposes only and are not all-inclusive.

**Font:** New Designs require only two fonts Arial and Arial Black.

**Text Height and Width:** Text height and width is set at a base value that will be multiplied by a scale factor. For text notes that would be plotted at a plot scale of 1/4"=1' , a scale factor of 48 would be used to multiply the base text height. Notation text that has a base text height of .01 multiplied by 48 will result in a text height of 0' 6". Each text style has a base text height relative to the scale factors that will be incorporated in the drawing being developed.

**Slant Angle:** Text used to describe hydrographic features such as channel names, cut labels, water body titles, flow directions, range mark annotations, soundings, etc.

**Justification:** All efforts have been made to establish a best fit for the justification for each style based on the most common use. It is possible that the user may need to modify the justification for abnormal situations.

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### Plans Preparation Manual

#### True Type Text User Guide

**Line Spacing:** Standard line spacing of ½ the text height has been used in all styles.

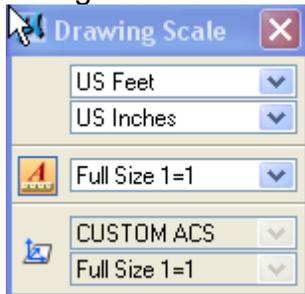
**Underlining:** Text underlining has been activated for all styles where an underline is preferred including Cut Label, Sub-Title, and Main-Title text placements.

**Background Block-out:** Most text styles have been set-up to block-out interfering background graphic elements with the default background color. This will not plot, but will eliminate the need for clipping or deleting elements which interfere with notes or text placed in the design file.

Each Text Style activates the Annotation Scale Lock that will control the text attributes of the same text style based on the scale factor set. For example, if the drawing scale is changed, the text size will change as well.

**Note: If in a 3d file, you must reset the active Z (elevation) to an elevation above the other elements in the file over which the new text will be placed or the background blocking will not be successful.**

**Drawing Scale** The drawing scale tool is a companion tool to text usage and is used to set the intended scale for each drawing. The drawing scale tool can be activated from the Settings menu in Microstation. The tool (shown below) can be set to the intended plot scale after activation of the Annotation Scale Lock as show below by the darkened icon containing the red "A". Select the scale pull-down to the right of the annotation scale lock. When using the workspace configuration the user will be able to access any needed scale.



Finally, when the Text Styles and Drawing Scale tools are used in conjunction with one another the scale-based text-size calculation process can be eliminated for the user.

**Older Projects:** Project started prior to June of 2009 require the use of Bentley Fonts. Projects in this category should have workspaces set up that will make use of text styles as defined in the workspace implemented before True Type Text implementation. Call the SAJ CADD Coordinator for further details if needed.

### **Text Style Workflow.**

## Appendix B-7

### Plans Preparation Manual

#### True Type Text User Guide

Project files being developed should be contained only in a Project Wise directory for Corps of Engineer users; AE firms should have a workspace setup that make use of the DGNLIBs much the same way as described above<sup>2</sup>. In this way a workspace configuration can be assigned that will provide the user the needed resources such as Text Styles that are discussed below.

The workspace attaches a DGNLIB that provides text styles. Previous documents have been distributed that introduced True Type fonts and text styles that were initially set up, as well as a procedure for use of the drawing scales. These tools work in conjunction with one another. See the workflow below.

**Step 1. Open the Drawing Scale tool.** From the main menu select: Settings> Drawing Scale. The Drawing scale tool will open (the dialog can be docked at the top or bottom of your screen).

**Next: Select the Annotation Scale Lock icon.**

**Next: Select the scale to which you will be plotting.** This sets the scale factor that multiplies base text settings by the scale factor to generate a “real-world” text heights based on the style being used.

**Step 2. Select the appropriate text style from the list provided.** The styles are arranged in categories of usage. *See list below.*

*The examples below assume a drawing scale setting of 1”=100’ (scale factor 1200:1)*

<b>Style Name</b>	<b>Font Name</b>	<b>Scale Factor</b>	<b>Text Height</b>
<b>Channel Cut, and Water Body labels</b>	Arial Black (slanted 22°)	1200:1	17.5 ‘
<b>Channel Range text</b>	Arial (slanted 22°)	1200:1	14’
<b>Match Line text</b>	Arial (bold)	1200:1	14’
<b>Dimension</b>	Arial	1200:1	12’
<b>Drawing No. (Title block)</b>	Arial Black	1200:1	30’
<b>General Text and Schedules</b>	Arial	1200:1	12’

<sup>2</sup> See Workspace Readme file from downloaded from the SAJ website.

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Plans Preparation Manual  
 True Type Text User Guide

<b>Headings and Stationing text</b>	Arial	1200:1	14'
<b>Main Subject Title</b>	Arial Black	1200:1	20'
<b>Notes (Multi-line &amp; Leader)</b>	Arial	1200:1	12'
<b>Slanted Notes</b>	Arial	1200:1	12'
<b>Sub-Title (Sections-Details-Plan)</b>	Arial Black	1200:1	17.5
<b>Symbology</b>	Symbol	1200:1	12'

The user must only set the scale from the drawing scale tool and then select the text style based on the category of use. The text height is automatically set.

**Note:** If opening an existing drawing or referencing an older drawing where other Text Styles have been used, the user may see additional text styles in the Text Styles dialog that do not comply with the required format.

# Appendix B-8

## Plans Preparation Manual

### Microstation Level Settings and Level Overrides

**Purpose:** The purpose of this Appendix item is to describe the use and management of Microstation Levels.

**Definitions:**

**Levels:** Microstation uses the term Level; AutoCad uses Layer. Levels are used to segregate drawing elements into manageable groups within a DGN file.

**Level Attributes:** Microstation Levels have element assignment attributes such as color, weight, line style, level locks, plot/no plot settings, level display settings, etc.

**Level Overrides:** Level Overrides allow the user to change the appearance of elements on levels by setting color, weight, line style to settings different than those set in the by-level settings in the Level Manager.

**LS:** Line Style definition

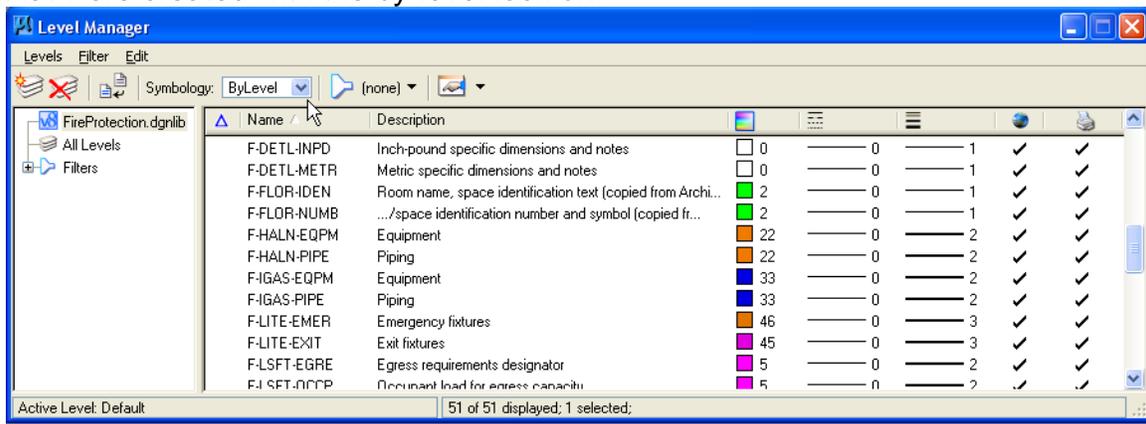
**CO:** Element Color assignment

**WT:** Element Weight assignment

**DGNLIB:** Design File Library The DGNLIB assigned by a workspace predefines the level names and attributes when attached to the active design file. The levels assigned by the DGNLIB contains the attributes prescribed by the AEC CADD Standard.

**Microstation Levels and Attributes.**

Microstation V8 Levels have a format that differs greatly from Microstation V7. Microstation V8 have the ability to attach definitions of Names, color, weight, and style of elements created or assigned to each level. In addition each attribute can be locked to force each of the three level primary attributes to the settings set in the level manager. For example, the level for channel toes (C-CHAN-TOE~) has settings of Color= 1, line style=3, weight=3. If each of these level attributes are set to Bi-Level, then when the level is set to current or active and an element is created in the design file, the attributes will be assigned to the elements. By the same token, when one of these attributes are changed then the color, line style, or element weight will also change in the existing elements that were created with the by-level lock on.

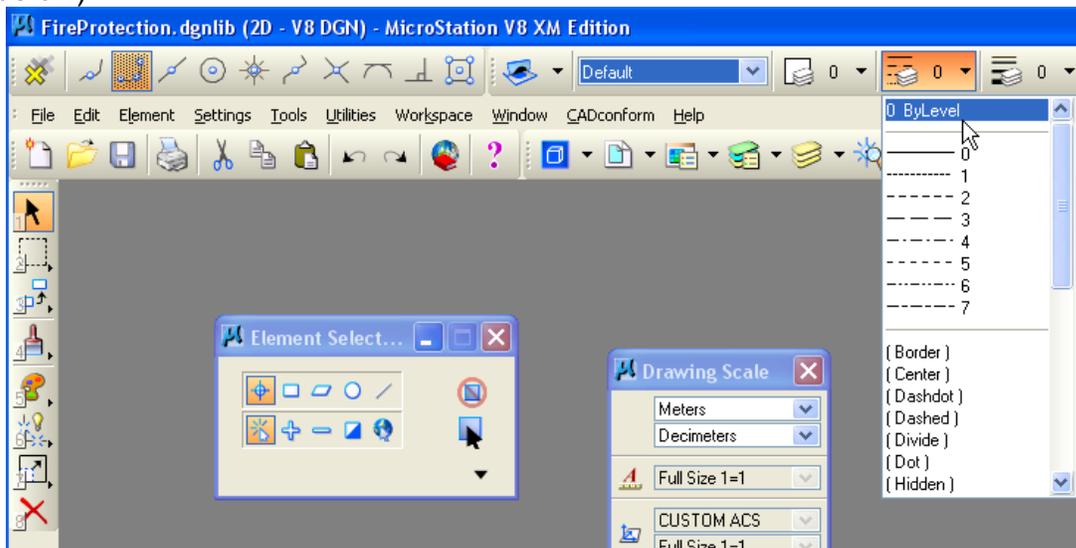


## Appendix B-8 Plans Preparation Manual

### Microstation Level Settings and Level Overrides

#### **Elements Controlled by By-Level Lock.**

Elements assigned to each level can be assigned a “bylevel” setting. This means that elements placed in the design file will be forced to inherit the attributes assigned in the level manager. In so doing, existing levels placed previously in the file will inherit the colors, weights or styles assigned by the By-level lock. To lock this ByLevel setting use the cursor to select either of the color, weight or style from the primary attributes tool bar and find the by-level option in either of these dialogs and select it. This will set the by-level setting lock. (see example below)



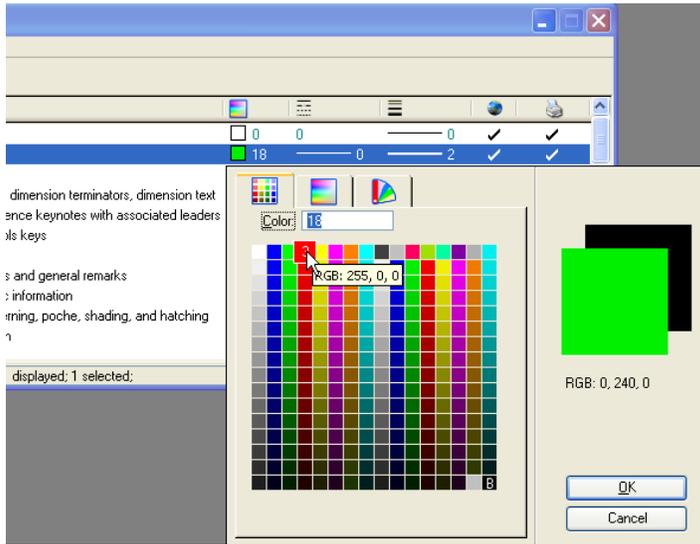
#### **Changing Level Attribution.**

Level attributes are assigned in the Level Manager as delivered by the DGNLIB. The assignments are defined in the AEC CADD Standard. The preparation of project plans can require the modification of existing Color, Weight or Line Style in order to differentiate existing elements from design elements for example. The attribute can be changed in the local file, *(as shown below in the level manager)*, however, this practice will invoke errors in the compliance review process during submittal periods. If changes are needed to be made, defining **Level Overrides** is the accepted practice as described in **Setting Up Level Overrides**.

# Appendix B-8

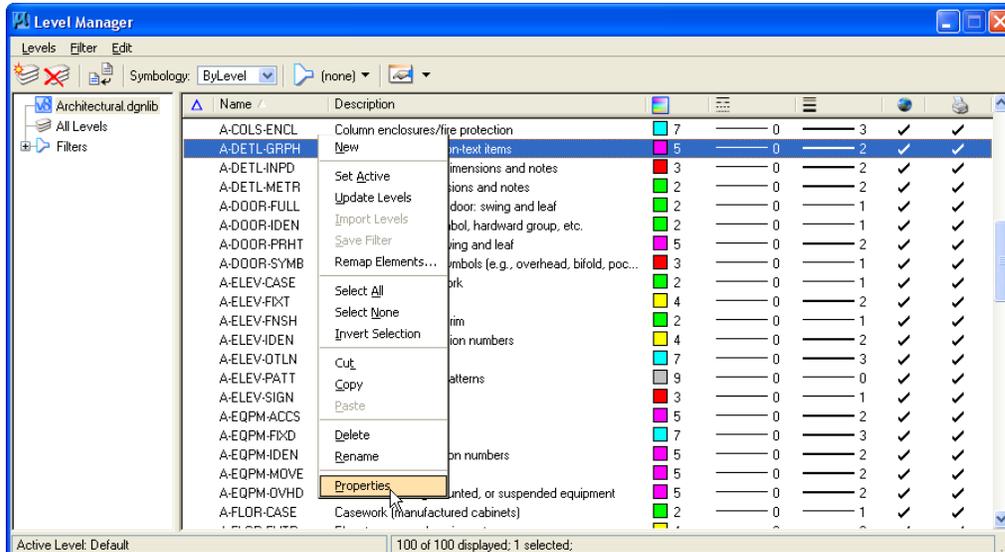
## Plans Preparation Manual

### Microstation Level Settings and Level Overrides



#### Setting Up Level Overrides.

Changing level attributes by using level overrides is a preferred method because you can change the appearance of level attributes without actually changing the by-level attribute assignments. See the image to the level overrides dialog below.

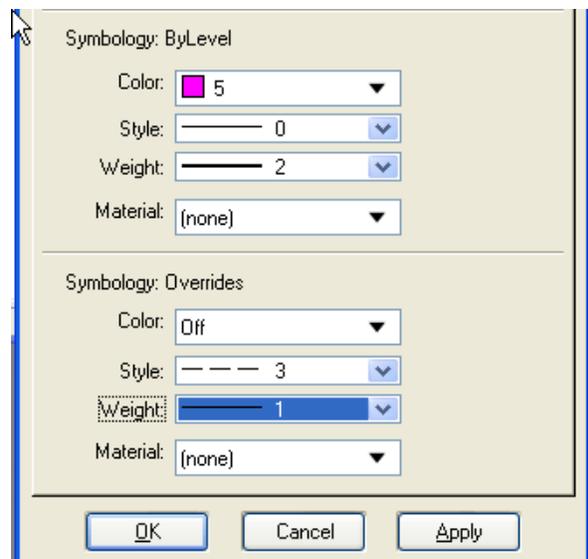
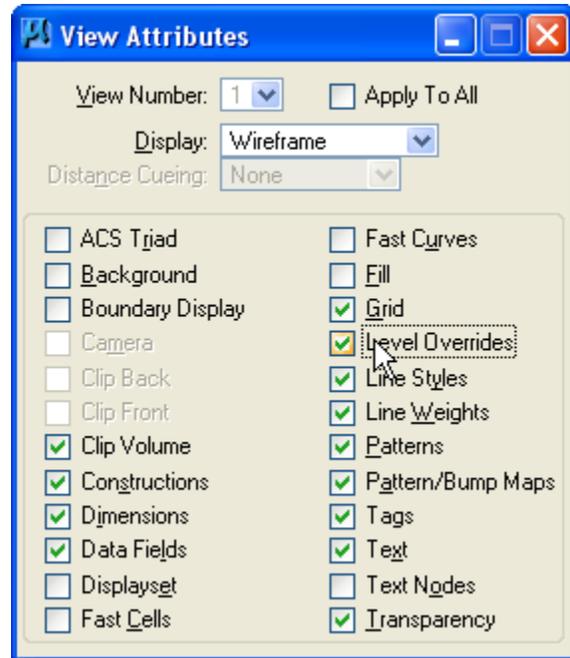
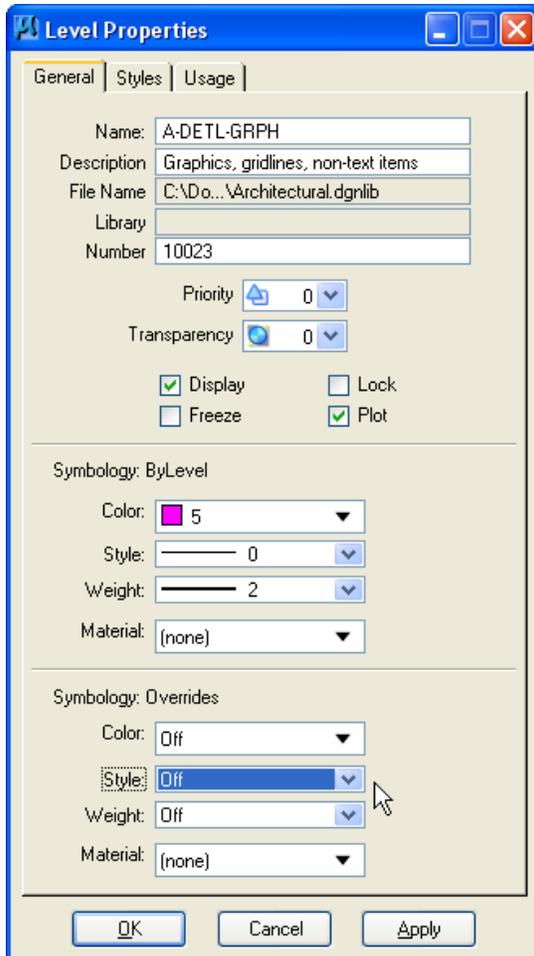


Notice the properties menu item above is highlighted. This is found by right-clicking the mouse (reset) button and selecting Properties. See the resulting Properties dialog below. Notice the lower portion of the properties dialog entitled Symbology Overrides. The color, style, weight, or material can be changed. The changes will affect the dgn elements' appearance for the specific level for which element overrides have

## Appendix B-8 Plans Preparation Manual

### Microstation Level Settings and Level Overrides

been assigned. However the View Attributes (below-right) must have the Level Overrides selection must be activated. A caveat to using Level Overrides is that when activating Level Overrides will display all override settings which have been defined or turned on in the properties of each level in the design file levels. All efforts have been made to turn off level overrides in the DGNLIBs that have been provided in the SAJ Workspace.



Note in the partial dialog on right that the style and weight have been changed as might be desired to show elements that represent existing items when the segregating new from existing is desired. Remember level overrides and view attributes are companion dialogs that require coordination.

## Appendix B-9

### Plan Preparation Manual

### Managing Line Style Scales

New Workflows require the use of Annotation Scale Lock to be set. This enables the use of the required Drawing Scale Tool and Text Styles and Line Style scaling. The workflow for the Annotation Scale Lock, Text Styles, and Drawing Scale is described in Appendix B-7. Line Styles are also integral to the proper presentation and drafting quality standard requirements and are controlled by the Annotation Scale Lock. The description and workflow below explains the proper use of these tools in association with the line style usage.

New Drawings created and developed in a properly configured workspace such as the Jacksonville District's workspace will provide the attachment of the Text and Dimension style library (USACE-Dim-TextstylesTT.dgnlib) file and the AEC Standard Line Style resource file (tsaec.rsc). These two resources will provide the user with the proper text styles and line styles needed for standard compliance design products.

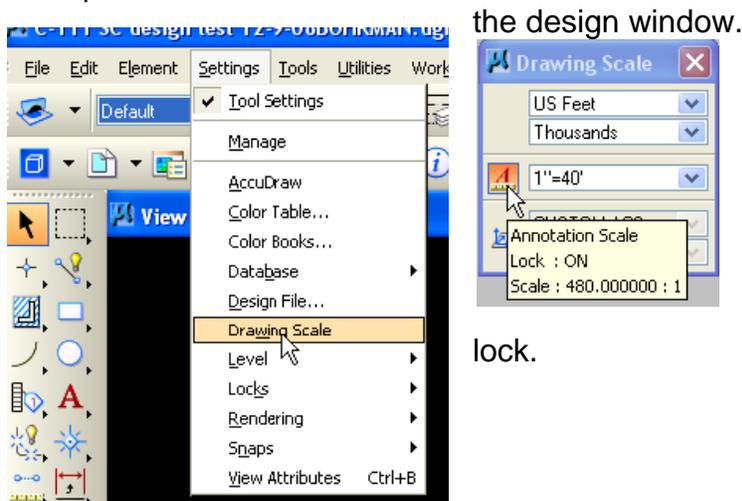
Standard line styles are scaled based upon the CADD Scale factor. For example a intended plot scale of 1" = 10' would result in a scale factor of 120. Applying that scale factor to the linestyle will properly size the components of the line style. If the line style is a under ground electric utility and is represented by a "E-ux" text symbol inserted in the line, the correct line style will size the line style symbols (and text) appropriately.

#### **WORKFLOW:**

#### **NEW DRAWINGS:**

Assumptions: A workspace is configured attaching the Text and Dimension DGNLIB file and the AEC Line Style Resource file.

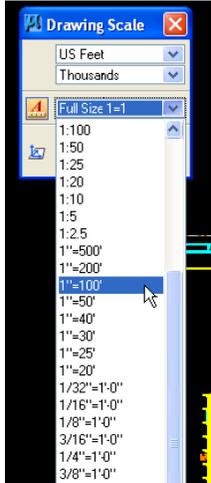
**Step 1. Open the Drawing Scale Tool.** The tool is found under the Microstation Settings Main Menu item. Once the Drawing Scale tool is opened, It may be docked at the top or bottom of



a. Activate the Red "A" icon in the Drawing Scale tool. This will allow the drawing scale to be set to the intended plot scale and also sets the Annotation Scale

lock.

## Appendix B-9 Plan Preparation Manual Managing Line Style Scales



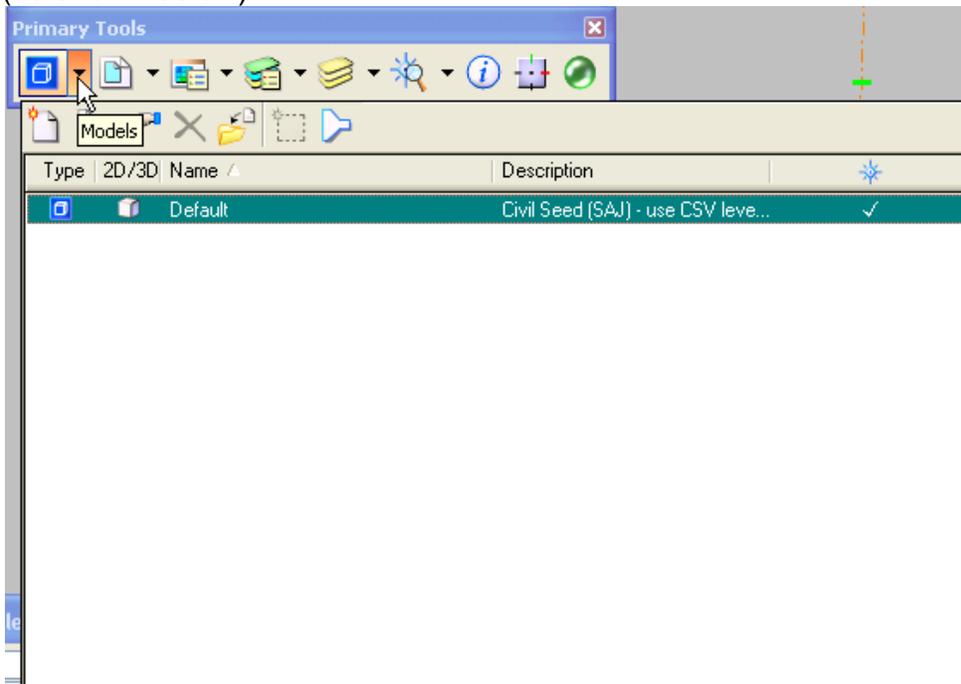
b. With the Annotation Scale Lock activated, Text size and line style scale will be automatically set or sized appropriate to the scale factor as seen at left.

c. The AEC Standard Levels have colors, weights and line styles assigned as bylevel attributes. See *Appendix B-8 Level Attributes and Level Overrides*. A properly configured Workspace will automatically set the proper level library and the line style resource files. The AEC Levels Standard includes assignments of line styles for each level. Each line style's appearance is controlled by the Drawing Scale and Annotation Scale Lock. Line style scales are automatically sized by the drawing scale factor.

### Step 2. Verify Active Model Properties

Open the Model dialog by selecting the blue box-shaped icon on the Primary Tools palette.

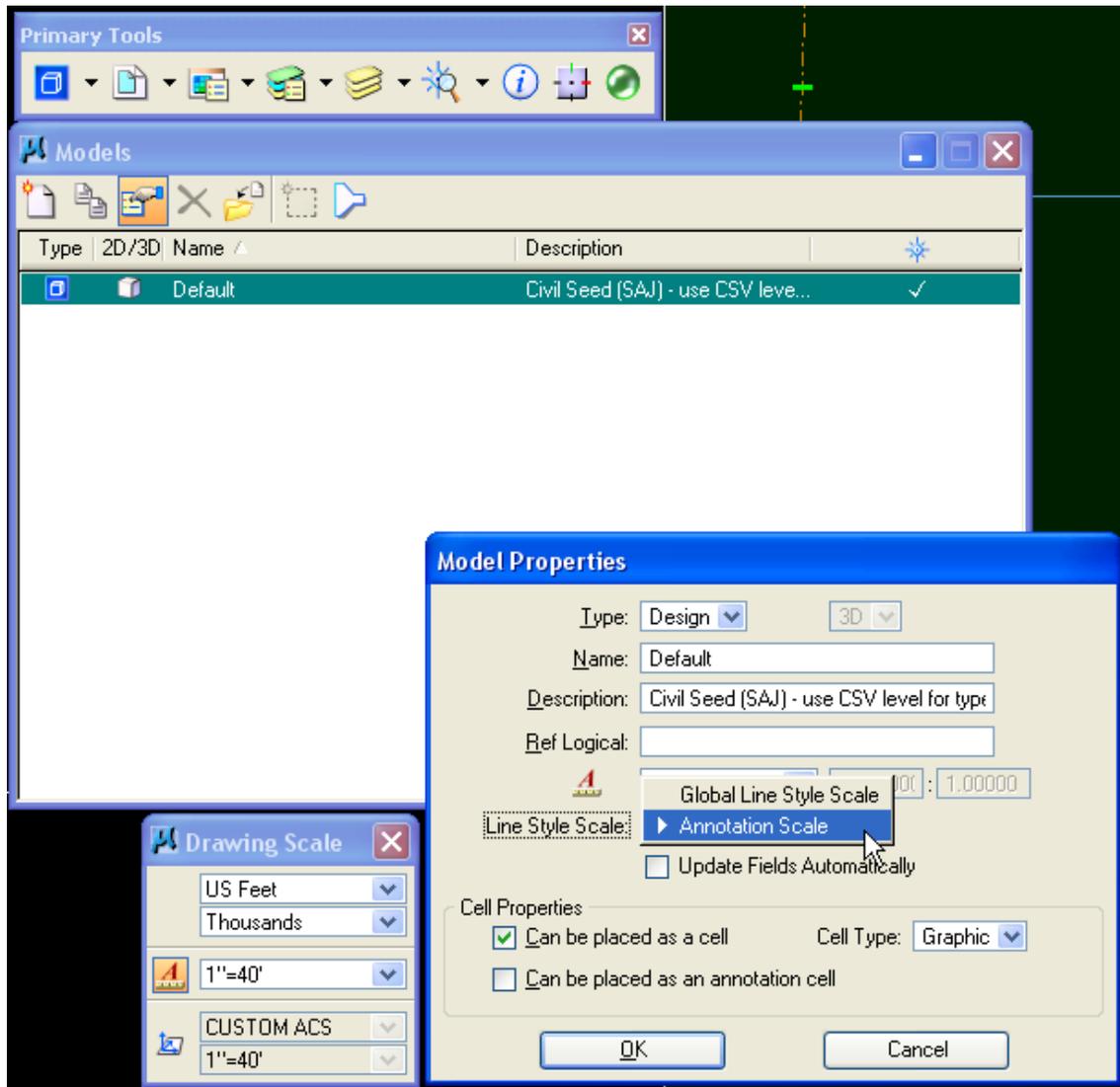
The Primary tools dialog is shown below and contains the Models icon and tool dialog (as shown below).



## Appendix B-9 Plan Preparation Manual Managing Line Style Scales

From the models dialog select the properties option from the Properties icon as indicated showing the highlighted icon below.

This will display the Model Properties dialog. In the middle portion of the dialog you will see the Line Style Scale: field. This field has a pull-down with both “Global Line



Style Scale” and “Annotation Scale” options. Always select the Annotation Scale option. This setting will automatically be set in all seed files and dgnlib files. Using this option will scale placed line styles appropriately according to the scale factor used.

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[Managing Line Style Scales](#)

Note that the Drawing Scale is set to 1"=40' which equates to a scale factor of 480. The scale factor is the value that increases the line style to the proper size.

Remember that using the Annotation Scale Lock, Drawing Scale tool, Text Styles, Dimension Styles, and Line Style scaled with annotation scale lock is mandatory for all COE users and those preparing designs for the Jacksonville District.

### **WORKING WITH EXISTING DRAWINGS:**

Existing design files are most often used in the reference file mode. Being able to control the scale of line styles however is still necessary due to the requirements to utilize annotation scale lock and drawing scales to size text, dimensions, and line styles. Existing files must be opened and existing line styles must have the line style scale turned off. This will allow the Annotation Scale Lock to work in conjunction with the Drawing scale or Active Scale (AS) to properly size text, dimensions and line styles. This is a editing process that is accomplished by following the steps below.

#### **Step 1. Open the Active Model dialog in the existing file.**

- a. Open the properties of the active file model dialog. *Note: If the existing file is a survey file, someone in Geomatics will have to edit the file and make needed changes.*
- b. Change the Line Style Scale field from **Global Line Style Scale** to **Annotation Scale**. *See the dialog describing the new file procedures for the view of the Model dialog and Model Properties dialog.*

#### **Step 2. Turn off the Line Style Scale.**

- a. Open the Microstation Elements Menu Item and select the Line Styles menu item and then Custom. This will display the line style definition and a Line Style Scale: field. Edit the field to read 1.0000. Uncheck the Line Style Scale: item.

#### **Step 3. Identify the custom line styles to be rescaled.**

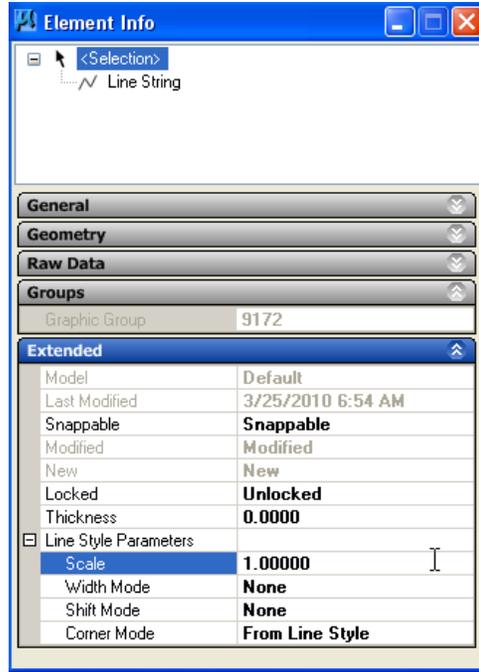
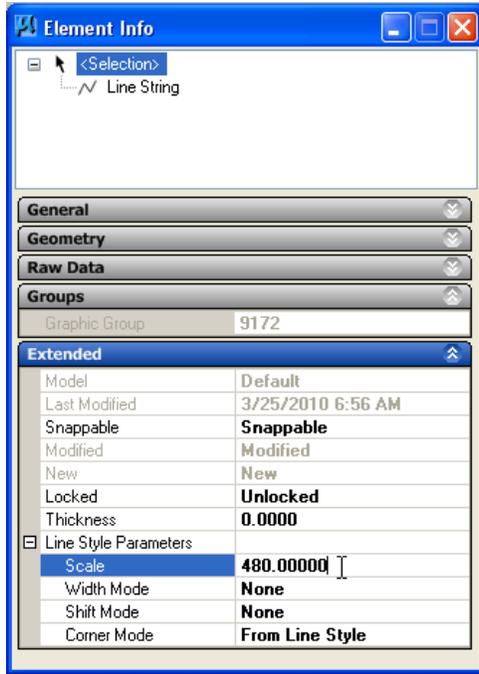
- a. Lines that are needed to be rescaled in active files to differing scales such as lines containing codes or text that will appear much larger than normal and affect the presentation quality are candidates to modify.
- b. Activate the Element Information tool and select the line style element. This will display the properties of the line as seen below. Note that the Extended section of the Element Info shows a line style scale of 480 (a 1"=40' scale factor) . This field will have to be modified to a scale of 1. See the screen capture below. Repeat the process for each line style that need to be modified. *Note: the in this case the Line Style Scale was already set to 480 so if the **drawing scale** (or Active Scale) is also set to 480 then the one will be multiplied by the other resulting in an huge scale.*
- c. Be sure to save the settings of the design file before exiting the drawing.

# Appendix B-9

## Plan Preparation Manual

### Managing Line Style Scales

Note: The two dialogs below shows the before and after state of needed field entry changes.



[Appendix C](#)  
[Plans Preparation Manual](#)  
CadConform Report Generator Guide

**The CadConform® Report Generator Guide**

The Report Generator is describe below in the excerpt from AltivaSoft Inc Cadconform Guide Chapter 3. This excerpt has been reproduced by permission and intended for use by Corps of Engineers personnel only in conjunction with license agreements that apply.

# The Report Generator

## *Generating Reports*

### GENERATING REPORTS

The Report Generator is used to create reports on a list of design files that do or do not match any of the features in the chosen Feature Tables. The Report is generated as a database table, either in the CADconform database, or in a separately chosen ODBC data source (as defined by the user). This database table can then be printed out, converted to a text file or other file format.

*Note: To run reports, the user must be logged into CADconform and the user must be granted the privileges from the CADconform Administrator to create reports. The Administrator can lock the user into a “reporting only” database.*

To start the Report Generator, from the CADconform Toolbox, click on the **Generate Report** icon.



Figure 29: Starting the Report Generator

If no Feature Tables have been selected, the Feature Table Manager will open. Highlight the necessary Feature Tables to generate the reports and then click **Open**.

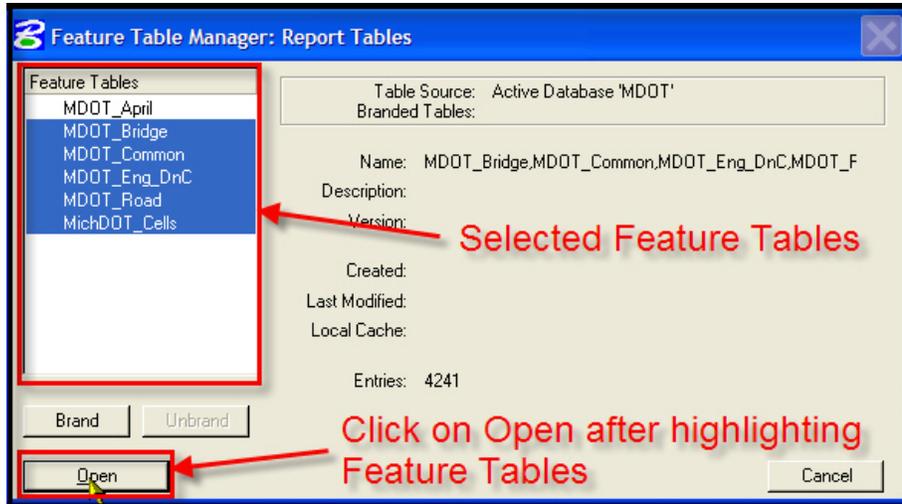


Figure 30: Selecting Feature Tables for Report Generation

After selecting the Feature Tables and clicking on **Open**, the Report Generator opens.

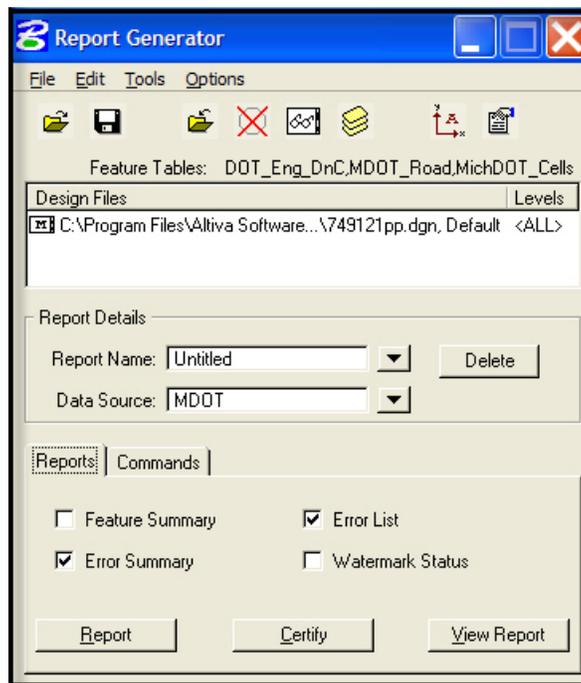


Figure 31: The Report Generator

There are several options available to the user to configure the Report Generator as to what files Reports will be generated for and what information will be included in the reports. Reports can be generated for multiple design files and the Report Generator can search for and report on Reference Files. Reports can be generated for specific levels within the design file. In the case of Reference Files, the user has the option to generate reports only for the clipped portion of the Reference File or the entire Reference File.

To run a report you must first type in a report name. Do not use special characters other than *underscores* in the Report Name field. Toggle checkmarks adjacent to the type of report to be run. In the example below, an Error Summary and an Error List Report are to be run. Click the **Report** button to generate the report.

*Note: The user will be warned if a report name exists. The user will have the option to overwrite or delete a report if he is either the original owner of the report or has been granted the privileges to do so by the CADconform Administrator.*

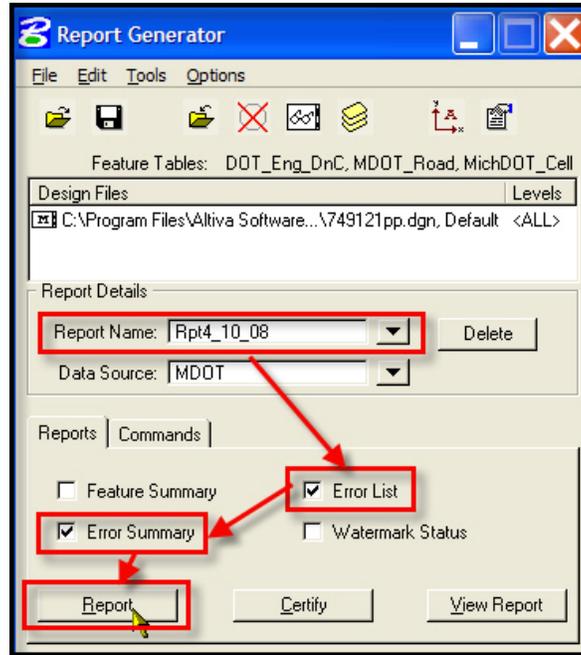


Figure 32: Creating Report Name Rpt4\_10\_08

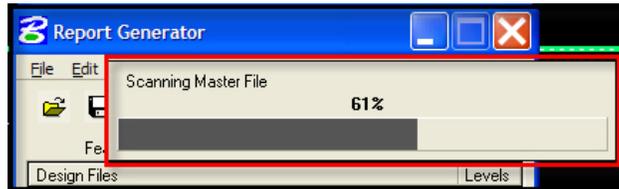


Figure 33: Report Progress Status

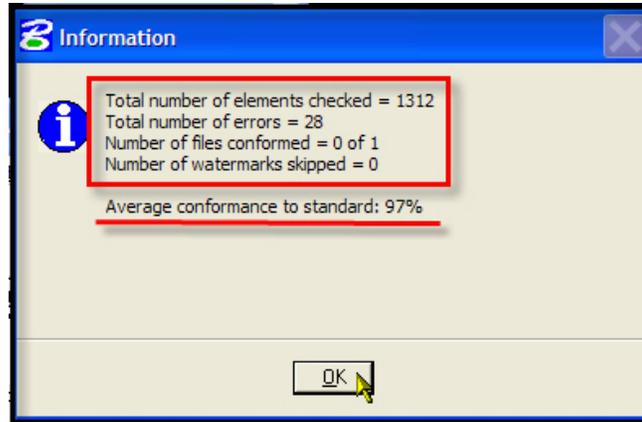


Figure 34: Report Summary

MULTIPLE FILE REPORT

To run a report on multiple files, the user must first select the files. This can be accomplished one of two different ways.

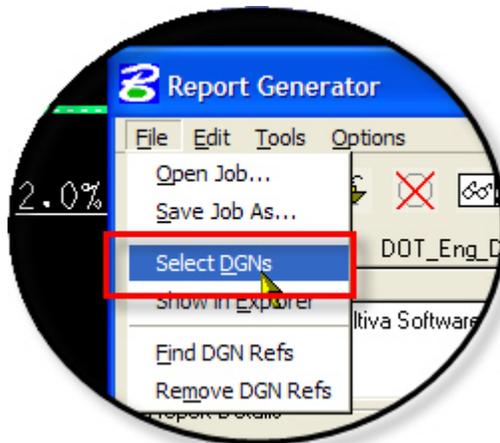


Figure 35: Select DGNs

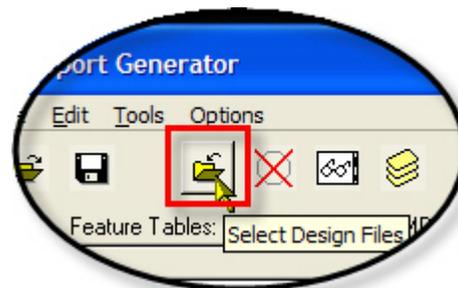


Figure 36: Select Design Files

Either of the above options will open the **Design Files to Process** dialog box.

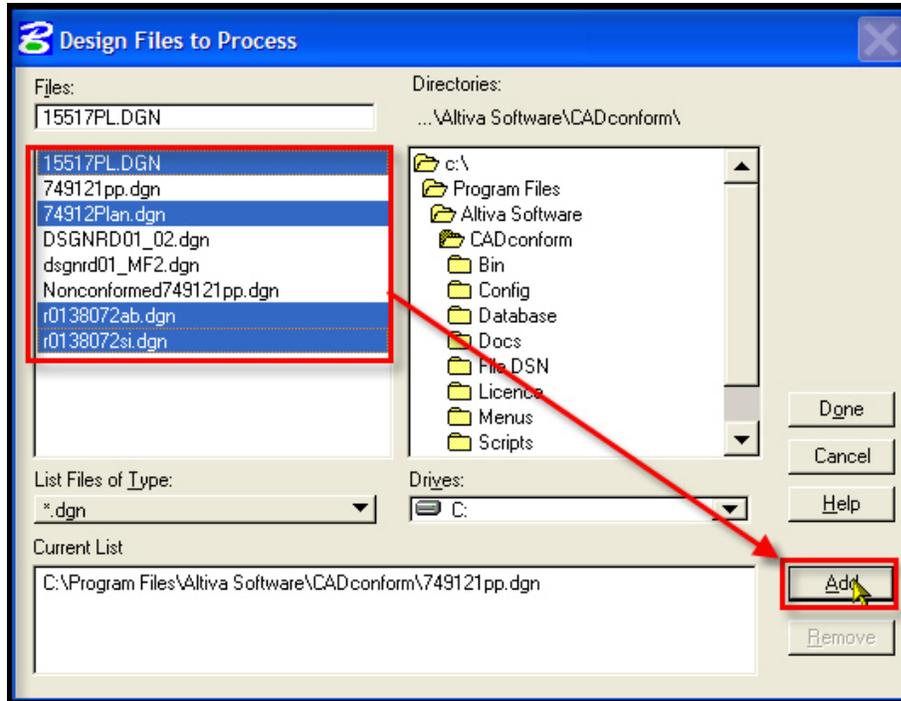


Figure 37: Select the Files and click on Add

Highlight the files to be selected and click on **Add**. The selected files are added to the **Current List** box.

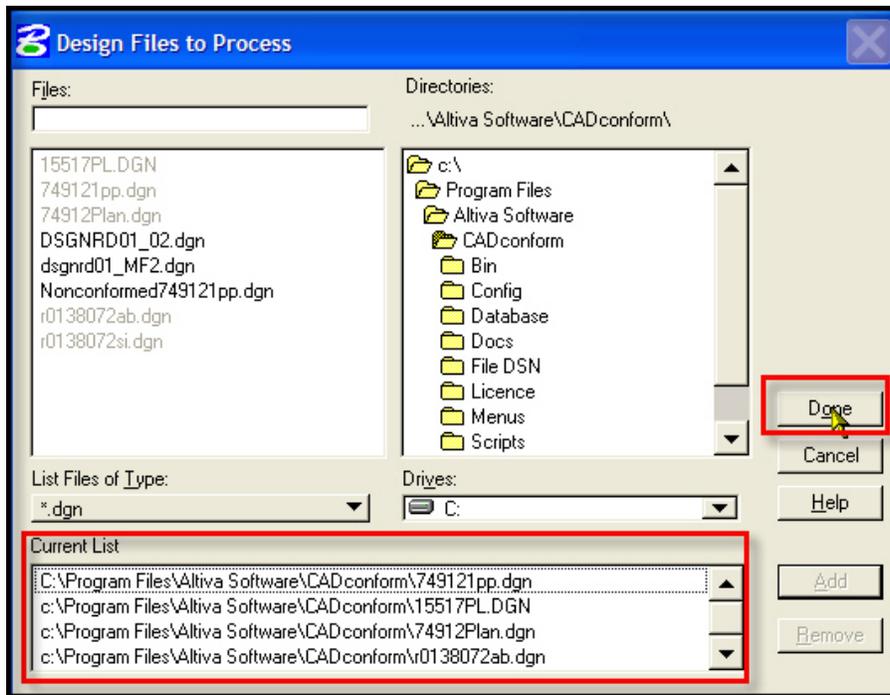


Figure 38: Current List box Populated

Once the files have been selected, click the **Done** button.

*Note: Each file in the Current List box will be opened as it is processed. You will see the opening and closing of each design file on your screen. At the completion of the process, the last file opened will remain as your active design file until you reopen the original file.*

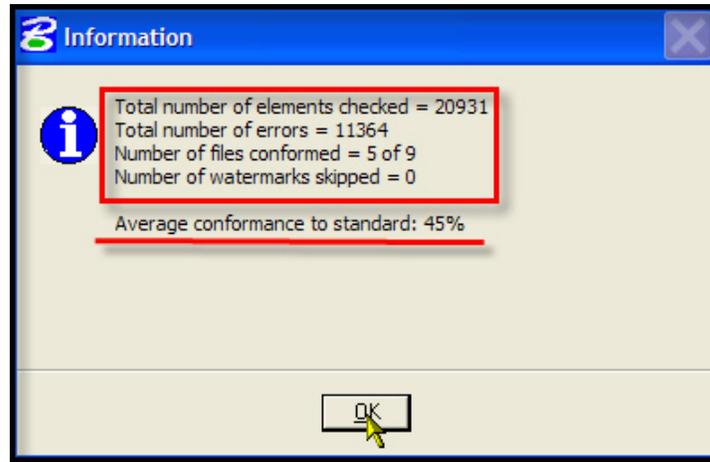


Figure 39: Report Summary from Multiple Files

## The Report Viewer

### *Viewing the Reports*

The Report Viewer allows a simple way for the user to view the contents of a report without resorting to opening the database from within a database application. This is particularly advantageous for users who do not have a database application loaded on their machine.

The Report Viewer also provides a method of interactively reviewing errors in the report, and exporting reports to text files or comma separated value files (CSV) for importing into Spreadsheet applications such as Microsoft Excel.

#### UTILIZING THE REPORT VIEWER

After running reports using the CADconform Report Generator, the user clicks on the **View Report** button to open the Report Viewer.

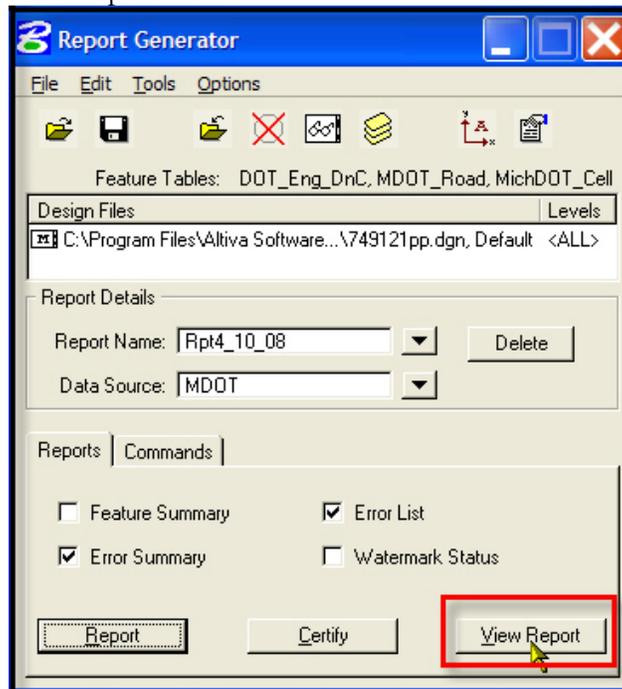


Figure 40: Viewing the Report

## VIEWING THE REPORTS

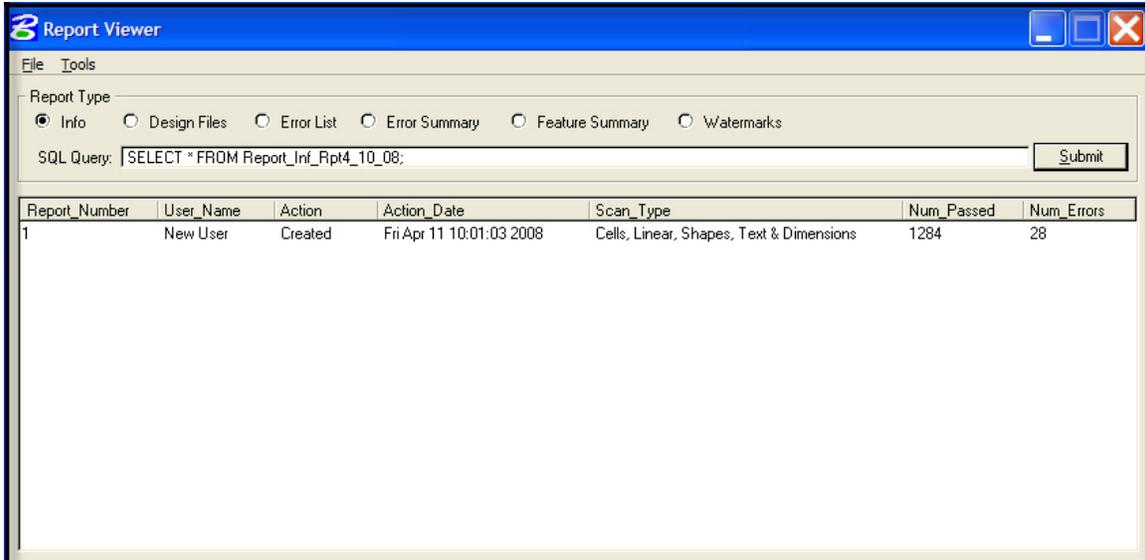


Figure 41: Report Viewer

The Report Viewer dialog and its columns are fully resizable. To view an error summary, toggle on the Error Summary radio button by clicking on it. This will cause the Report Viewer to list a summary of the error types and the number of errors for the particular error type.

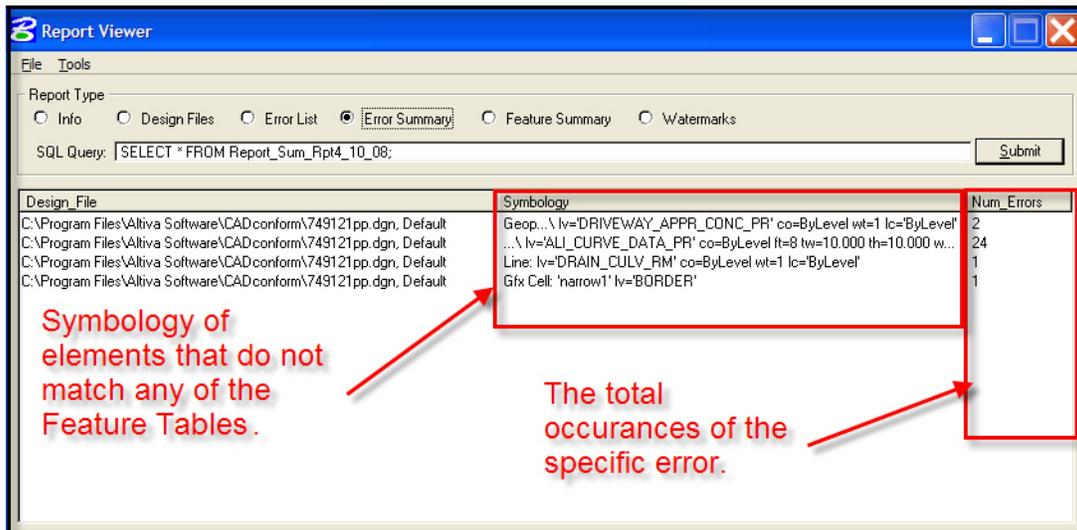


Figure 42: Error Summary

## VIEWING THE REPORTS

A nice feature of the Report Viewer is that if information in a specific column is truncated due to the column width, the user does not have to adjust the column width to see the entire information. By holding the mouse over a truncated column, the entire information for that specific row in that column will be displayed as shown below.

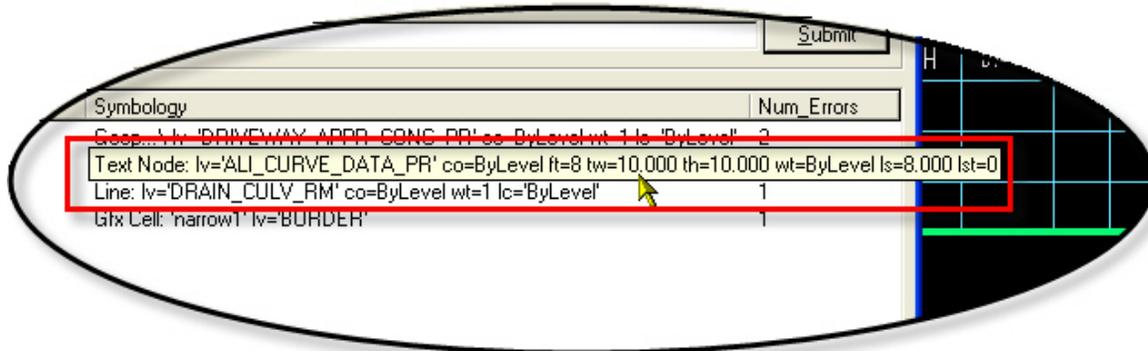


Figure 43: Expanded column width

The Error List lists each error in the design file. It also lists the location of the error within the design file and has intelligence tied to the report such that double clicking on the error in the report will locate the error in the design file. In the case of error reports for multiple design files, the file containing the error will open to display the error.

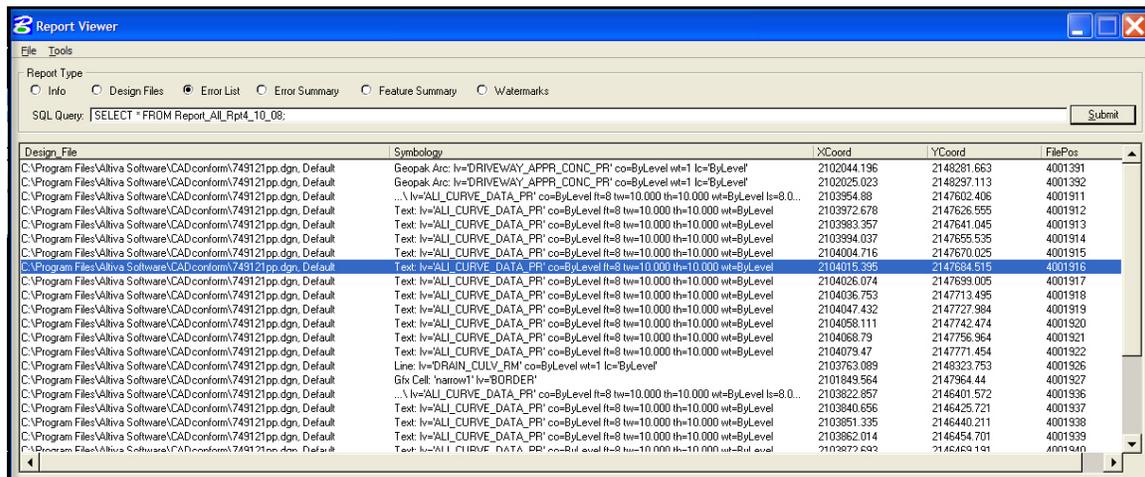


Figure 44: Error List

Double clicking on the line in blue above will take me to the location of the text error shown in this report.

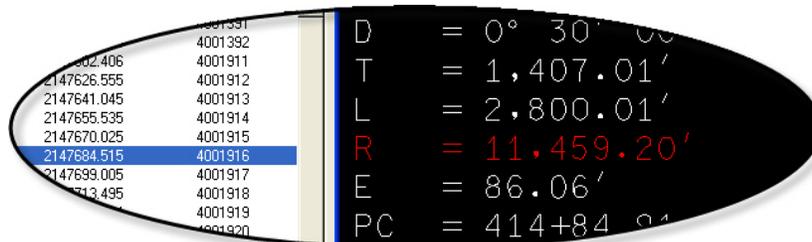


Figure 45: Location of error

## VIEWING THE REPORTS

### EXPORTING THE REPORT TO A TEXT FILE

Reports generated by CADconform can be exported to a text file by simply clicking on File then Export.

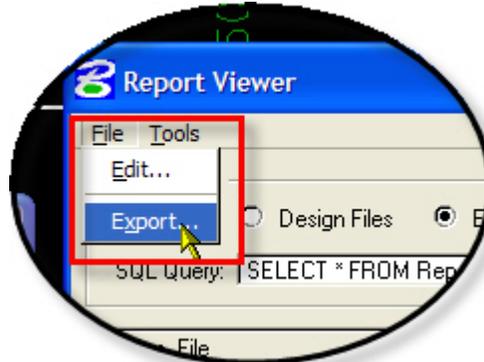


Figure 46: Exporting Report

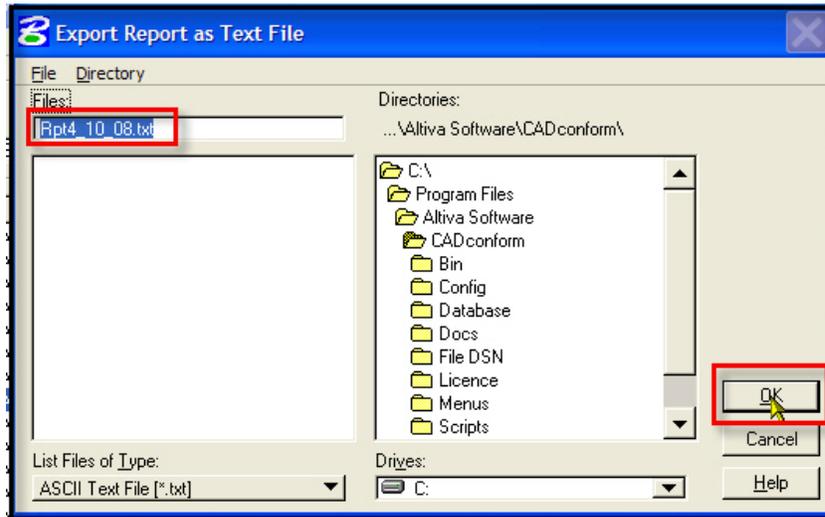


Figure 47: Exporting Report

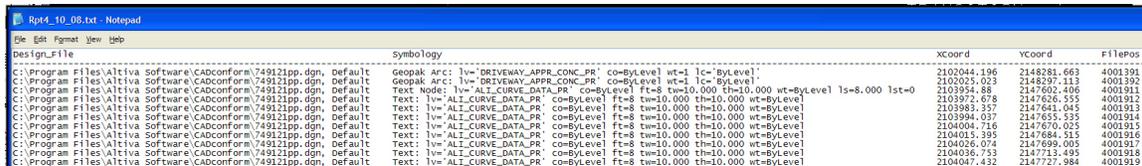


Figure 48: Sample Report exported text file