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MDOT MicroStation Tools and Procedures, 2007

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MDOT MicroStation Tools and Procedures

TABLE OF CONTENTS

MDOT MICROSTATION TOOLS AND PROCEDURES I

Table Of Contents i

CHAPTER 1 GENERAL PROCEDURES 1-1

How to use the Manual 1-2

Keeping Your Manual up to Date 1-3

Users Responsibility 1-3
Message of the Day 1-3
Website Location 1-3
Sending Requests via E-mail 1-3

Using the Table Of Contents As a Quick Punch List 1-4

Using the On-Line Manual 1-5

Overview 1-5
Opening from within MicroStation 1-5
Searching the On-line Manual 1-5
Following Cross References 1-5

Help with MicroStation 1-6

Internal Help Program 1-6
CADD Support Personnel 1-6

Interface Overview 1-8

GUI: The Graphical User Interface 1-9

How do I get back Tool Bars that are missing? 1-9
How do I retrieve missing tools on a Tool Bar? 1-10

Mouseing 1-11

Standard Buttons 1-11
Troubleshoot the Middle Button 1-11
Using a Wheel Mouse 1-12

Menu Overview 1-13

Introduction 1-13
The Principal 1-13
Organization: The Top Level 1-13
Organization: The Next Level 1-13
Organization: Submenus 1-14
Conclusion: The Pros and Cons 1-14

File Management 1-15

Network Overview 1-16

MicroStation Customization files and Drawing Files: 1-16

Opening Files 1-17

Making New Files 1-18

Setup 1-18
Launch the Makesheetz macro 1-18
Choose Preliminary Information 1-18

Choose a File Type *1-18*
Final Filename Editing *1-19*
End Game *1-20*
Safety Features *1-20*
File Names 1-21
Sheet Renumbering Utility 1-22
Introduction *1-22*
Operating the Utility *1-22*
Prioritizing Plan Set *1-23*
Precautions *1-24*
PCF Editing 1-25
Discussion *1-25*
Edit PCF File *1-25*
Border Information Macro 1-27
Discussion *1-27*
Sheet Numbering *1-27*
Process Options *1-27*
Error Messages *1-28*
Side Effects *1-28*
Changing Data After the Fact *1-28*
Troubleshooting *1-29*
Disabling the BorderInfo Substitution 1-30
Overview of Droplink.bas *1-30*
Setup *1-30*
Run the DropLink Macro *1-30*
What Does it Do? *1-30*
Quitting *1-30*
Plotting Overview 1-31
MaineDOT Plot Drivers – Region 0 1-32
Overview *1-32*
US_ OCETDS860-full-rm126 – Final Full Size Plotting *1-32*
US_ OCETDS860-half-rm126 – Final Half Size Plotting *1-33*
US_ OCETDS860-long-rm126 – Long Plots (5' – 20') *1-33*
US_PLOT2FILE *1-33*
US_ OCETDS600-full-rm312 - Full Size Check Plots *1-33*
US_ OCETDS600-half-rm312 – Half Size Check Plots *1-33*
US_ OCETDS600-long-rm312 – Long Plots (5' – 20') *1-34*
US_OCETCS500-full-rm126 – Full Size Color Plotter *1-34*
US_OCETCS500-half-rm126 – Half Size Color Plotter *1-34*
US_OCETCS500-long-rm126 – Half Size Color Plotter *1-34*
US_HPCOLOR4 ..... *1-34*
US_HPCOLORRoom303 ..... *1-34*
US_HPCOLORRoom303Half *1-35*
US_HPCOLORRoom321 ..... *1-35*
US_HPCOLORRoom321Half *1-35*
US_ pdf-8x11 ..... *1-35*
US_ pdf-8x11color *1-35*
US_pdf-color-fullsize *1-35*
US_ pdf-color-halfsize *1-35*
US_ pdf-fullsize *1-36*
US_ pdf-halfsize *1-36*
PRINTER_BW *1-36*
PRINTER_COLOR *1-36*
PRINTER_STANDARD_DETAIL *1-36*
Hearing_PRINTER *1-36*

Regional Office Plotters (HP750C and OCE Plotter) 1-37
Overview *1-37*
US_FULL750C_???_GR *1-37*
US_HALF750C_???_GR *1-37*
US_Long_750C_???_GR *1-37*
US_PLOTCHP_??? *1-37*
US_OCE9400FULL *1-37*
US_OCE9400HALF *1-38*
US_OCE9400LONG *1-38*
US_OCETDS400FULL *1-38*
US_OCETDS400HALF *1-38*
US_OCETDS400LONG *1-39*
Pen Tables 1-40
Overview *1-40*
!pentable.tbl *1-40*
Amendment.tbl *1-40*
As-Built.tbl *1-40*
BORINGLOG.tbl *1-40*
ENV_PRINTER_COLOR *1-40*
Graysurvey_wetlands.tbl *1-40*
Heavytopo.tbl *1-40*
MHPC.tbl *1-41*
MHPCplan-No Symbology *1-41*
Prelim_plan_color.tbl *1-41*
Title.tbl *1-41*
Hearing_Thicker.tbl *1-41*
Hearing_Thinner.tbl *1-41*
PublicHearing.tbl *1-41*
usPublicHearing.tbl *1-41*
Laserjetblack.tbl *1-41*
Rowblack.tbl *1-41*
Single Sheet Plotting (Fence Plotting) 1-42
Overview *1-42*
Step One: Place a fence *1-42*
Step Two: Select Print/Plot *1-42*
Step Three: Select Pentable (If Necessary) *1-43*
Step Four: Modify Attributes (Optional) *1-43*
Step Five: Preview Print (Optional) *1-43*
Step Six: Show More Details *1-44*
Step Seven: Check Scale *1-44*
Step Eight: Print *1-45*
Plotting Sheet Files (Batch Printing) 1-46
Overview *1-46*
Step One: Making a Batch Print Job *1-46*
Step Two: Add Design Files *1-47*
Step Three: Set Specifications *1-48*
Step Four: Printing with Batch Print *1-50*
Batch Print Troubleshooting *1-51*
Printing from an Existing Batch Print Job 1-52
Creating Long Plots 1-54
Step One *1-54*
Step Two: Placing the Cell *1-54*
Step Three: Rotate View *1-54*
Step Four: Printing *1-55*
Fence Plotting to Scale 1-58

Step One: Place Fence *1-58*
Step Two: Setting Scale *1-58*
Color Plotting 1-60
File Setup *1-60*
Plotting to PDF 1-61
Create MicroStation PDFs *1-61*
Printing PDF *1-62*
Plotting to PLT 1-66
Create MicroStation PLTs *1-66*
Using Print Exec Workgroup 1-67
Overview *1-67*
Help *1-67*
Plotters Available *1-67*
Step One: Adding Files to Print Exec Workgroup *1-67*
Recalling a Previous Job *1-71*

CHAPTER 2 GENERAL TOOLS 2-1

Fundamentals 2-2

Element Attributes 2-3
Setting Attributes *2-3*
Settings Manager *2-3*
Level Display *2-4*
Level Manager *2-5*
Snaps 2-7
AccuSnap *2-8*
Keypoint *2-9*
Intersection *2-9*
Center *2-9*
Nearest *2-10*
View Control 2-11
Overview *2-11*
Rotate View *2-11*
3D Troubleshooting *2-11*
Complex Chains and Shapes 2-12
Overview *2-12*
Creating Complex Chains *2-12*
Creating Complex Shapes *2-13*
Troubleshooting *2-14*
Complex Regions 2-15
Overview *2-15*
Launching the Tool *2-15*
Complex Region Methods *2-15*
Fill *2-18*
Keep Original *2-18*
Tips and Tricks for Flood *2-19*

Introduction to the Settings Manager 2-20

Structure of the Settings Manager 2-21
The Many Faces of the Settings Manager *2-21*
Opening the Settings Manager *2-22*
Settings Manager Scale 2-23
Real World Size Vs. Paper Size *2-23*
Selecting a Scale *2-23*

What does this change? *2-24*
Settings Manager Working Units 2-25
Choosing a Working Units Setup *2-25*
The Defaults *2-25*
Switching to U S Custom *2-25*

Fences & Groups 2-26
Selection Sets 2-27
Select All *2-27*
Select None *2-27*
Element Selection *2-27*
PowerSelector *2-28*
Methods *2-28*
Modes *2-28*
"Permanent" Grouping *2-28*
Advanced PowerSelector 2-30
Setup *2-30*
Tabs *2-30*
Adding Elements *2-30*
Subtracting Elements *2-32*
Color, Style, Weight, Type and Class *2-32*
Select By Attributes 2-33
Overview *2-33*
Standard Methods *2-33*
Element Type Hints *2-34*
Advanced Select By Attributes 2-35
Overview *2-35*
Modes *2-35*
Properties *2-36*
More Properties *2-37*
Set Select By From Element *2-37*
Fences 2-39
Discussion *2-39*
Fence Types *2-39*
Fence Modes *2-39*
Points to Ponder *2-40*
Graphic Groups 2-41
Overview *2-41*
Graphic Group Lock *2-41*
Adding Elements to a Graphic Group *2-41*
Removing Elements from a Graphic Group *2-42*
Adding Elements to an Existing Graphic Group *2-42*

AccuDraw 2-43
Fundamentals of AccuDraw 2-44
Introduction *2-44*
Shortcut Keys for Construction *2-45*
AccuDraw Settings 2-46
Operation Tab *2-46*
Display Tab *2-47*
Coordinates Tab *2-47*
AccuDraw Shortcut Commands 2-49
Some Important Shortcut Keys *2-50*
AccuDraw Example: Roadway Templates 2-51
Calculating Slope *2-51*

Placing Accudraw's Origin *2-51*
Drawing in Sub-Units 2-53
Drawing by Coordinates 2-54
Using the Data Point Keyin *2-54*
Locking AccuDraws Compass at 0,0 ..... *2-54*

Measuring 2-55
Coordinate Readout 2-56
Linear Units, Accuracy *2-56*
Angle Accuracy and Mode *2-57*
Measuring Part 1 2-58
Measuring Part 2 2-59
Measuring Areas *2-59*
Measuring Areas and Placing Text 2-60
Step One: Lock "Z" to Zero *2-60*
Step Two: Set the Category Scale *2-60*
Step Three: Set the Text Attributes *2-60*
Step Four: Open Measure Area Tools *2-60*
Step Five: Select Measure Area Tool *2-61*
Step Six: Select None *2-62*
Tips and Tricks 2-63
Measuring with Flood Method *2-63*
Converting Metric Measurements to English *2-63*

Reference Files 2-65
References Dialog 2-66
List box *2-66*
Icons *2-67*
Hilite Mode *2-67*
Main Menu (Tools) *2-68*
Main Menu (Settings) *2-69*
References Attach 2-70
Nested Attachments *2-71*
Depth *2-72*
Display Raster References *2-72*
Reference File Moving 2-73
Reference File Rotation 2-74

Raster Files 2-75
Attaching a Raster Image to Scale 2-76
Determine Image Size *2-76*
Place Block *2-76*
Attach Raster Image *2-77*
Georeferenced Images 2-79
Overview *2-79*
Preferences *2-79*

Macros 2-80
Plotting by Station and Offset 2-81
Starting Point *2-81*
Entering the Distance and Direction *2-81*
Choosing the Direction *2-82*
Choosing the Offset Distance *2-82*
Troubleshooting *2-83*

HotSwap 2-85
Overview *2-85*
Launch the Macro *2-85*
Identify the Element *2-85*
Set Zoom Level *2-85*
Tips *2-85*
Label Slope By Points 2-86
Overview *2-86*
Setup *2-86*
Run the Macro *2-86*
Flattening your Active File 2-87
When to Flatten *2-87*
How to Flatten *2-87*
How to Undo The Flatten *2-87*
Other Options When Flattening *2-87*
Just What Exactly Does the Flatten Macro Do? *2-88*
Steel Macro 2-89
Overview *2-89*
Step Zero: Preparation for the Macro *2-89*
Step One: Launch the Macro *2-89*
Step Two: Pick Your Shape *2-89*
Step Three: Choose an Origin *2-91*
Step Four: Place the Shape *2-92*
Option One: More of the Same *2-93*
Option Two: Undo *2-93*
Option Three: Using Previous Shapes *2-93*
Option Four: Angle Legs *2-94*
Weld Macro 2-95
Overview *2-95*
Step One: Launch the Macro *2-95*
Step Two: Enter Points *2-95*
Step Three: Fill out the Dialog *2-95*
Step Four: Apply Settings *2-99*
Undo It *2-99*
Move Filled Shapes Back 2-100
Launch the Macro *2-100*
What Does it Do? *2-100*
Batch Processor 2-101
Overview *2-101*
Keyin Commands *2-101*

CHAPTER 3 SURVEY CLEAN-UP PROCEDURES 3-1

MX Deliverables and Updates 3-2
General Information 3-3
Standard Naming *3-3*
Preserving Original Files *3-3*
Initial Topography 3-4
Step One: MX Editing *3-4*
Step Two: Create MicroStation Drawings *3-4*
Step Three: Update Status Report *3-5*
Step Four: Communication *3-5*

Topography Updates 3-6
Step One: MX Editing *3-6*
Step Two: Create New MicroStation Drawings (Adds) *3-6*
Step Three: Regenerate Points, Contours & Triangles *3-6*
Step Four: Regenerate Topo Model *3-7*
Step Five: Recreate Mapping Model *3-7*
Step Six: Update Status Report *3-7*
Step Seven: Communication *3-7*
Step Eight: Create Zip Files For A Design Consultant (If Necessary) *3-7*
Step Nine: Communication to Consultant Coordinator (if necessary) *3-9*

MicroStation Cleanup Procedures 3-10
General Information 3-11
Standard Naming *3-11*
Preserving Original Files *3-11*
The End Result *3-11*
Initial Topography Cleanup 3-12
Quick Punch List *3-12*
Determine Direction of Proposed Alignment *3-12*
Step One: Open Windows Explorer *3-12*
Step Two: Open the Topo Folder *3-13*
Step Three: Copy Files from Survey\Msta to Topo Folder *3-13*
Step Four: Open MicroStation *3-15*
Step Five: Attach Reference Files *3-16*
Step Six: Turn Off Line Weights (Optional) *3-17*
Step Seven: Adjust Level Display (Optional) *3-17*
Step Eight: Load Clean-up Tools (Optional) *3-17*
Step Nine: Adjust Ditch Arrows (May be Necessary) *3-19*
Step Ten: Flatten Your Drawing *3-21*
Step Eleven: Determine Direction of Proposed Alignment *3-21*
Step Twelve: Adjust View and Save Settings (Optional) *3-22*
Step Thirteen: Reverse Element Direction *3-23*
Step Fourteen: Rotating Topography Cells *3-24*
Step Fifteen: Moving Vertices *3-27*
Step Sixteen: Adjust and Save Changes (Courtesy To Others) *3-27*
Step Seventeen: Add Note to Cleanlog.txt File! *3-27*
Step Eighteen: Open and Flatten Contours and Points *3-28*
Step Ninteen: Repeat for Mapping.dgn (Projects that Utilizes Aerial Mapping) *3-28*
Initial Text Cleanup 3-29
Determine Direction of Proposed Alignment *3-29*
Step One: Open the Text.dgn (From the Topo Folder) *3-29*
Step Two: Reference Topo.dgn and Mapping.dgn (If exists) *3-30*
Step Three: Flatten the Drawing *3-30*
Step Four: Adjusting Text Height, Width and Line Spacing *3-30*
Step Five: Rotating Text *3-31*
Step Six: Moving Text *3-33*
Step Seven: Editing Text (Optional) *3-33*
Step Eight: Labeling With Arrows (Optional) *3-33*
Step Nine: Find and Replace Text (Metric Projects Only) *3-34*
Step Ten: Adjust and Save Changes (Courtesy To Others) *3-34*
Step Eleven: Add Note to Cleanlog.txt File! (Courtesy To Others) *3-34*
Additional Topography Cleanup 3-35
Quick Punch List *3-35*
Step One: Copy/Rename Origtopoadd#, Origtextadd#, Contours and Points *3-35*
Step Two: Add Note to Cleanlog.txt File! *3-35*
Step Three: Open Topoadd# *3-36*

Step Four: Attach Reference Files *3-36*
Step Five: Refer to Step 6 through Step 18 in the "Initial Topo Cleanup" portion of this manual *3-36*
Additional Text Cleanup 3-37
Determine Direction of Proposed Alignment *3-37*
Step One: Open the Textadd#.dgn (From the Topo Folder) *3-37*
Step Two: Reference Topoadd#.dgn *3-37*
Step Three: Refer to Step 3 through Step 11 in the "Initial Text Cleanup" portion of this manual *3-37*
Blending New Topo and Text With Old 3-38
General Information – Blending Tips *3-38*
Aerial Mapping Projects *3-38*
Adjust Colors for Easy Editing - Level Symbology (Optional) *3-38*
File Swapping (Handy Tip - Optional) *3-44*
Highlite Display of Reference Files (Optional) *3-44*
Update the Reference File Sequence (Optional) *3-45*
Merging New Topo and Text With Old 3-46
Step One: Open Topo.dgn and Attach Topoadd#.dgn *3-46*
Step Two: Merging Topoadd# File *3-46*
Step Three: Open Text.dgn and Attach Textadd#.dgn *3-46*
Step Four: Merging Textadd# Files *3-47*
Step Five: Moving Topoadd# and Textadd# *3-47*
Step Six: Add Note to Cleanlog.txt File! *3-47*
Step Seven: Copy Contents of Topo folder to Y:drive (Regional Employees) *3-48*

Wetland Survey Cleanup 3-49
General Information 3-50
Standard Naming *3-50*
Preserving Original Files *3-50*
The End Result *3-50*
Initial Wetlands Cleanup 3-51
Quick Punch List *3-51*
Step One: Open Windows Explorer *3-51*
Step Two: Open the Topo Folder *3-51*
Step Three: Open the Survey\MSTA Folder - Copy Files to Topo Folder *3-52*
Step Four: Open MicroStation *3-53*
Step Five: Attach Reference Files *3-54*
Step Six: Flatten Your Drawing *3-55*
Step Seven: Adjust View and Save Settings (Optional) *3-55*
Step Eight: Reverse Wetland Linestyle Direction *3-56*
Step Nine: Moving Vertices *3-57*
Step Ten: Changing Linestyle (if necessary) *3-58*
Step Eleven: Add Wetland Lines (if necessary) *3-58*
Step Ten: Adjusting Text Height, Width and Line Spacing *3-58*
Step Eleven: Rotating Text *3-59*
Step Twelve: Moving Text *3-61*
Step Thirteen: Add Note to Cleanlog.txt File! *3-61*
Additional Wetlands Cleanup 3-62
Quick Punch List *3-62*
Step One: Copy Wetlandsadd# *3-62*
Step Two: Add Note to Cleanlog.txt File! *3-62*
Step Three: Open Wetlandsadd# *3-62*
Step Four: Attach Reference Files *3-62*
Step Five: Refer to Step 6 through Step 13 in the "Initial Wetlands Cleanup" portion of this manual *3-63*
Merging New Wetlands With Old 3-64
Step One: Open Wetlands.dgn and Attach Wetlandsadd#.dgn *3-64*
Step Two: Merging Wetlandsadd# Files *3-64*

Step Three: Moving Wetlandsadd# *3-64*
Step Four: Add Note to Cleanlog.txt File! *3-64*
Step Five: Copy Contents of Topo folder to Y:drive (Regional Employees) *3-65*

CHAPTER 4 PLAN DEVELOPMENT 4-1

Title Sheet Development 4-2
Quick Punch List *4-2*
Create A Title Sheet 4-3
Step One: Open MicroStation *4-3*
Step Two: Create Title Sheet *4-3*
Step Three: Editing Text Headings *4-3*
Creating Location Maps 4-4
Step One: Open Location Map *4-4*
Step Two: Locate the Project Area *4-4*
Step Three: Place the Square *4-4*
Step Four: Save the Locmap.dgn *4-4*
Step Five: Copy Map to Clipboard *4-4*
Step Six: Paste Map *4-5*
Creating A Layout (Highway Projects With A Survey & Design) 4-6
Introduction *4-6*
Step One: Create a Layout Drawing *4-6*
Step Two: Place a North Arrow *4-6*
Step Three: Rotate Your View *4-6*
Step Four: Create a Saved View *4-7*
Step Five: Reference the view into the Title Sheet *4-7*
Step Six: Tweaking the Layout Placement *4-8*
Step Seven: Stationing the Layout *4-9*
Step Eight: Shading the Layout Drawing *4-10*
Step Nine: Adjusting the Layout Scale *4-12*
Step Ten: Place Text on the Title Sheet *4-13*
Creating A Layout (No Survey) 4-14
Introduction *4-14*
Step One: Place Temporary North Arrow *4-14*
Step Two: Place a Fence *4-14*
Step Three: Copy Fence *4-14*
Step Four: Scale and Rotate *4-15*
Step Five: Adjust Scale *4-15*
Step Six: Place North Arrow *4-15*
Step Seven: Place Text on the Title Sheet *4-15*

Typical Section Sheet Development 4-16
Quick Punch List *4-16*
Things to Remember *4-16*
Freehand Template Techniques *4-16*
Creating a Typical Section Drawing File 4-17
Step One: Open MicroStation *4-17*
Step Two: Create a New Drawing(s) *4-17*
Creating Typicals Using the Template Macro 4-18
Dimensions, Text, and Notes 4-19

Estimate Sheet Development 4-20
Quick Punch List *4-20*
Exporting Quantity Items from the Estimator 4-21

Introduction *4-21*
Step One: Getting into Estimator *4-21*
Step Two: Exporting (.he) File* *4-21*
Importing Lotus.CSV file into Estimated Quantities Sheet 4-23
Step One: Open MicroStation *4-23*
Step Two: Make an Estimate Sheet *4-23*
Step Three: Run Estimate Macro *4-23*
Step Four: Adjust Quantities *4-23*
Additional Sheet Needed? *4-24*

Drainage Sheet Development 4-25
Quick Punch List *4-25*
Using the Drainage Spreadsheet 4-26
Introduction *4-26*
Step One: Copy the Spreadsheet *4-26*
Step Two: Enter Drainage Data *4-26*
Step Three: Save as TXT file *4-26*
Importing Drainage Information 4-29
Step One: Open MicroStation *4-29*
Step Two: Make an Drainage Sheet *4-29*
Step Three: Run the Macro *4-29*
Multiple Drainage Sheets *4-29*

Notes Sheet Development 4-31
Quick Punch List *4-31*
Location and Explanation of Template Files 4-32
Introduction *4-32*
General Notes *4-32*
Summary of Excavation and Borrow *4-32*
Estimating US Customary Projects *4-32*
Estimating Metric Projects *4-33*
General Notes Sheets 4-34
Step One: Copy the Template File *4-34*
Step Two: Open and Edit Using WORD *4-34*
Step Three: Save As .txt File *4-34*
Step Four: Open and Copy the Text from the New File *4-35*
Step Five: Open MicroStation *4-35*
Step Six: Set Your Text Size and Font *4-35*
Step Seven: Paste the Selected Text *4-36*
Step Eight: Placing Text in the File *4-36*
Step Nine: Editing Text *4-36*
Construction Note Sheets 4-37
Introduction *4-37*
Importing Reports into Excel (Informational/Optional) *4-37*
Step One: Open Spreadsheet *4-38*
Step Two: Save as FormattedText (Space delimited) *4-39*
Step Three: Warnings *4-39*
Step Four: Open MicroStation *4-40*
Step Five: Set Your Text Size and Font *4-40*
Step Six: File Import>Text *4-40*
Step Eight: Editing the Text *4-40*

Geometric Sheet Development 4-41
Clean-up the Geometry 4-42
Introduction *4-42*
Step One: Opening and Editing the Geometry *4-42*

Step 2: Placing Notes from MX Reports *4-43*
Step 3: Annotating Point Numbers *4-44*
Creating Geometric Plans 4-45
Step One: Open the geometry.dgn *4-45*
Step Two: Reference hdplan.dgn and Alignments.dgn *4-45*
Step Three: Merging the Clip Boundaries into the Geometry File *4-45*
Step Four: Make Geometric Plan Files *4-46*
Troubleshooting *4-46*
Adjusting Saved Views *4-46*
Re-sheeting *4-47*

CHAPTER 5 ROADWAY SHEETS.....5-1

Roadway Plan Sheet Development 5-2
Creating Roadway Plan Sheet Drawings 5-3
Step One: Open your group's ??plan.dgn *5-3*
Step Two: Reference in Survey Data *5-3*
Step Three: Attach Proposed Design and Alignment *5-4*
Step Four: Place Clip Boundaries *5-5*
Step Five: Placing North Arrows *5-5*
Step Six: Create Cut Sheets *5-6*
Live Nesting *5-6*
Troubleshooting *5-7*
Adjusting Saved Views *5-7*
Re-sheeting *5-7*
Clean-up the Proposed Alignment File 5-8
Overview *5-8*
Step 1: Open the Alignment Drawing *5-8*
Step 2: Run the Macro *5-8*
Step 3: Adjusting "Flag" Text *5-8*
Step 4: Placing Curve Data *5-8*
Step 5: Placing Bearings *5-9*
Step 6: Flatten the Drawing *5-10*
Editing the Proposed Design (i.e. Highway.dgn or Bridge.dgn) 5-11
Step 1: Identify Elements Using MX Enquire *5-11*
Step 2: Setting the Attributes *5-12*
Step 3: Changing the Attributes *5-12*
Step 4: Finishing Up *5-12*
Step 5: Flatten the Drawing *5-13*

Profile Sheet Development 5-14
Profile Drawing Generation 5-15
Discussion *5-15*
Rename file to look alike (Optional) *5-15*
Step One: Symbology Correction *5-15*
Step Two: Rename the Drawings *5-15*
Step Three: Edit the PCF File *5-15*
Step Four: Border Information *5-16*
More Cleanup *5-16*

Cross Sections Sheet Development 5-17
Working With Cross-Sections 5-18
Discussion *5-18*
Rename file to Look alike (Optional) *5-18*
Step One: Symbology Correction *5-18*

Step Two: Rename the Drawings *5-18*
Step Three: Edit the PCF File *5-18*
Step Four: Border Information *5-19*
More Cleanup *5-19*

CHAPTER 6 GEOTECH SHEETS 6-1

CHAPTER 7 STRUCTURAL SHEETS 7-1

Overview 7-2

Detailing to Scale 7-3
Introduction *7-3*
File Segregation *7-3*
Creating A Detailed Drawing *7-3*
Creating a Numbered Border File *7-5*
Adding Further Details, Different Scales *7-8*
Tools in the Settings Manager 7-10
The File Making Macros *7-10*
Plot Scale *7-10*
Make Saved Views *7-10*
Structural Detail Settings Manager *7-11*
Dimensions and the Settings Manager 7-12
Dimensions With Arrows *7-12*
Angle (Text Above) & Angle (Text Horiz.) *7-13*
Dimension Arc Length *7-14*
Structural Detailing and the Settings Manager 7-15
Nuts and Bolts *7-15*
Some Typical Uses *7-15*
Adding New Detailing Types *7-16*
Changing Detail Scale 7-17
No Quick Solution *7-17*
Scale *7-17*
Text *7-17*
Dimensions *7-18*
Linestyles *7-19*
Speeding up the Process *7-19*
Text and the Settings Manager 7-21
A Word on Scale *7-21*
Text Components *7-21*
Behind the Scenes: The Long Way Around *7-21*
Placing Text Annotation *7-22*
Some Difficulties *7-23*
Changing Your Mind About Scale *7-23*

CHAPTER 8 TRAFFIC SHEETS 8-1

Accident Records Workflow 8-2

PIN CREATION 8-3
Step One: Opening the Command Prompt Screen *8-3*
Step Two: Changing Directory *8-3*
Step Three: Creating the Project Identifier *8-3*
Step Four: Editing Your Project Configuration File *8-5*

Step Five: Closing Command Prompt Window *8-6*

CHAPTER 9 ROW SHEETS 9-1

Overview 9-2

Construct Station and Offset 9-3
Starting Point *9-3*
Entering the Distance and Direction *9-3*
Choosing the Direction *9-3*
Choosing the Offset Distance *9-4*
Troubleshooting *9-5*

Procedures 9-7

Creating ROW Plan Sheets 9-8
Step One: Open RWPLAN-clips.dgn *9-8*
Step Two: Cut Sheets *9-9*
Step Three: Make new Plan Files *9-10*
Creating ROW Information Plan 9-11
Overview *9-11*
Step One: Creating 001_RWCoordinates.dgn *9-11*
Step Two: Placing Coordinate Information *9-12*
Construct a Metes and Bounds Description 9-13
Tools *9-13*
Setup *9-13*
Placing Lines *9-14*
For More Information *9-14*
Offset Using Copy Parallel *9-14*
Fitting the Layout *9-15*
Fine Tuning *9-16*
Baseline Overview 9-17
Baseline Tools 9-18
Smartline *9-18*
A Word About AccuDraw *9-18*
AccuDraw Shortcuts *9-19*
Conclusions *9-19*
Baseline Geometry 9-20
Step One: Bearing and Distance *9-20*
Step Two: Troubleshoot and Prepare to Draw a Curve *9-21*
Step Three: Draw a Curve *9-22*
Step Four: Troubleshoot and Prepare for Another Curve or Tangent *9-23*
Step Five: Troubleshoot and Prepare for Another Curve or Tangent *9-24*
Baseline Checking/Changing 9-25
Drop Complex *9-25*
Measure Lengths *9-25*
Measure Radius of Curves *9-26*
Fix the Problems *9-27*
Modify *9-27*
Rotate *9-27*
Punt *9-28*
Put It Back Together Again *9-28*
Baseline Stationing 9-30
Construct the PCs and PTs *9-30*
Double Check Your Baseline Chain *9-30*
Generate a Station Marker *9-30*

Place Generic Stations *9-31*
Fill in the Station Information *9-31*
PTs and Curve Data 9-34
Text Placement Options *9-34*
Label the PCs and PTs *9-34*
Place PC/PT Circles *9-35*
Place and Edit Curve Data *9-35*

Resources 9-38
ROW Function Keys 9-39

CHAPTER 10 HEARING SHEETS 10-1

CHAPTER 11 ENVIRONMENTAL SHEETS . 11-1

MHPC Documentation 11-2
Quick Punch List *11-2*
Viewing A Project Using MHPC Color Scheme 11-3
Step One: Start MicroStation *11-3*
Step Two: Creating a MHPC File *11-3*
Step Three: Adjust Background to White *11-4*
Creating MHPC Plan Sheets 11-5
Step One: Temporarily Attach HDPLAN or BDPLAN.dgn (Optional) *11-5*
Step Two: Copy Clip Boundaries *11-5*
Step Three: Create the Cut Sheets *11-5*
Step Four: Troubleshooting *11-6*
Editing MHPC Plan Sheets 11-7
Step One: Run the Border Information macro *11-7*
Step Two: Place MHPC Legend *11-7*
Step Three: Edit the Plan Type in the Title Box *11-7*
Step Four: Repeat as Necessary *11-7*
Adjusting Colors Manually In Reference Files 11-8
Batch Printing MHPC Plans Sheets 11-10
Step One: Open Batch Print Dialog *11-10*
Step Two: Select a Printer *11-10*
Step Three: Select Print Area *11-10*
Step Four: Select a Display (Pentable) *11-10*
Step Five: Add Design Files *11-10*
Step Six: Send the Plots *11-10*

Wetland Plans 11-11
Quick Punch List *11-11*
Need to Find Wetland Drawings? *11-11*
Plotting Wetland Plans for Biologist's (Using others Plan Sheets) 11-12
Introduction *11-12*
Step One: Start MicroStation *11-12*
Step Two: Open Any Drawing *11-12*
Step Three: Batch Printing - Create a New Batch Job *11-12*
Creating Wetland Plan Sheets for Biologist's 11-14
Introduction *11-14*
Step One: Create a Wetlands-clips Drawing *11-14*
Step Two: Temporarily Attach HDPLAN or BDPLAN.dgn (Optional) *11-14*
Step Three: Copy Clip Boundaries *11-14*

Step Four: Create the Cut Sheets *11-14*
Step Five: Troubleshooting *11-15*
Step Six: Batch Printing - Create a New Batch Job *11-15*

Army Corp. Documentation 11-17
Quick Punch List *11-17*
Cross Hatching Wetlands 11-18
Introduction *11-18*
Step One: Start MicroStation *11-18*
Step Two: Locate the Wetlands *11-18*
Step Three: Lock "Z" to Zero *11-18*
Step Four: Set the Category Scale *11-18*
Step Five: Cross Hatching Wetlands *11-19*
Adding Filled Shapes 11-20
Step One: Set the Shade Type *11-20*
Step Two: Create the Shape *11-20*
Step Three: Send Fill Back *11-20*
Step Four: Reset the Fill Type *11-20*
Measuring Areas and Placing Text 11-21
Step One: Lock "Z" to Zero *11-21*
Step Two: Set the Category Scale *11-21*
Step Three: Set the Text Attributes *11-21*
Step Four: Open Measure Area Tools *11-21*
Step Five: Select by Attributes *11-22*
Step Six: Select Measure Area Tool *11-23*
Step Seven: Select None *11-23*
Step Eight: Edit the Text (Optional) *11-23*
Step Nine: Masking References (Optional) *11-24*
Creating 8 ½ x 11 Cut Sheets 11-25
Step One: Set Category Scale *11-25*
Step Two: Place 8 ½ x 11 Clip Boundaries *11-25*
Step Three: Create the Cut Sheets *11-25*
Step Four: Troubleshooting *11-26*
Step Five: Run the Border Information macro *11-26*
Create a Title Sheet 11-27
Step One: Create a Title Sheet *11-27*
Step Two: Create a Location Map *11-27*
Step Three: Paste Map *11-27*
Create a Layout Drawing 11-28
Step One: Open EnvPlan *11-28*
Step Two: Create Saved View *11-28*
Step Three: Create 002_Layout Drawing *11-28*
Step Four: Attach Saved View *11-28*
Step Five: Adjust Level Display (if necessary) *11-28*
Batch Printing 8 ½ x 11 Cut Sheets 11-29
Step One: Open Batch Print Dialog *11-29*
Step Two: Select a Printer *11-29*
Step Three: Select Print Area *11-29*
Step Four: Select a Display (Pentable) *11-29*
Step Five: Add Design Files *11-29*
Step Six: Save your Batch Print job *11-30*
Step Seven: Send the Plots *11-30*

CHAPTER 12 REGIONAL WORKFLOW 12-1

Regional .UCF (User Configuration File) 12-2
Adjusting Existing Users To Regional Preferences 12-3
Overview 12-3
Step One: Copy New ".UCF Files" 12-3
Step Two: Adjust the Workgroup (If necessary) 12-3
Step Three: Working Locally or On the Network 12-4

Using Windows Briefcase 12-6
Create a Briefcase 12-7
Overview 12-7
Step One: Create D:\PIN folder 12-7
Step Two: Create a Briefcase 12-7
Step Three: Rename the Briefcase 12-8
Step Four: Open the Briefcase 12-8
Adding Projects to your Briefcase (All File Types) 12-9
Overview 12-9
Step One: Adding Network Files To Your Briefcase 12-9
Step Two: Synchronizing Databases 12-10
Step Three: Remove Database(s) from Synchronize List 12-12
Adding Projects to your Briefcase (By File Types) 12-14
Overview 12-14
Step One: Adding Network Files To Your Briefcase 12-14
Step Two: Select the File Types 12-15
Synchronize Your Briefcase 12-16
Update Briefcase and Network 12-16
Adding Additional File Types To Be Synchronized 12-20
Step One: Right Click Your Project at the decimal folder 12-20
Step Two: Select the Update Info Tab 12-20
Step Three: Synchronize Your Briefcase 12-21
Removing a Project from the Briefcase 12-22
Step One: Open Briefcase and browse to the MSTA folder 12-22
Step Two: Sort by File Status and copy to Clipboard 12-22
Step Three: Paste files into the appropriate folder on the Y: drive 12-22
Step Four: Delete the Project 12-22

CHAPTER 13 CONSULTANT CADD COORDINATION 13-1

Consultant CADD Coordination 13-2
Determine the Consultants Duties (Project by Project Basis) 13-3
What is their responsibility? 13-3
What do they need from us? 13-3
Sending Survey Files to a Consultant 13-5
MDOT Survey Data 13-5
Step One: Posting files to Outgoing FTP site 13-6
Step Two: Browse and Push Files to FTP 13-7
Step Three: Send Email with Link to File 13-8
Sending Other Files to a Consultant 13-9
Step One: Create Consultant "Out" Folder 13-9
Step Two: Create a Zip file 13-9
Step Three: Post to Outgoing FTP site 13-10
Receiving Project Files from a Consultant 13-11

File Format *13-11*
Drawings to Receive *13-11*
What don't we want back? *13-11*
Step One: Create a Consultant Directory *13-11*
Step Two: Download Files From Incoming FTP Site *13-12*
Step Three: Extract Files from the Zip folder *13-14*
Step Four: Rename Consultant files in Consultant\In Folder *13-15*
Step Five: Move Files to Bridge\MSTA, Highway\MSTA or ROW\MSTA *13-16*
Step Six: Compare with our Files (Optional) *13-16*
Step Seven: Send Message to Team Members *13-16*
Receiving Updates from a Consultant 13-18
Communication *13-18*
Is this a Complete Replacement? *13-18*
Readme file *13-18*
Step One: Create an OLD folder *13-18*
Step Two: Move Older file(s) into the OLD folder *13-18*
Step Three: Copy File From FTP to Consultant folder *13-18*
Step Four: Extract files, Rename Accordingly and move to MSTA Folder *13-19*
Step Five: Compare with our Files (Optional) *13-19*
Step Six: Send Message to Team Members *13-19*

Creating a .Dwg 13-20
Process Of Saving a Single File As a DWG 13-21
Introduction *13-21*
Step One: Open file to be Converted *13-21*
Step Two: Select File Save As… *13-21*
Step Three: Adjust Options *13-22*
Step Four: Zip and FTP the File *13-25*
Batch Processing Multiple Files to DWG 13-26
Introduction *13-26*
Step One: Open a File *13-26*
Step Two: Start Batch Utility *13-26*
Step Two: Adjust Options *13-26*
Step Three: Adjust Destination *13-26*
Step Four: Add Files to Convert *13-27*
Step Five: Process Files *13-27*
Step Six: Zip and FTP the File *13-29*

CHAPTER 14 USING PACKAGER (ARCHIVE) 14-1

Packaging a MicroStation File(s) – (Version 8 and higher) 14-2
Packaging Single or Multiple Files 14-3
Step One: Open File to Package (Archive) *14-3*
Step Two: Open Packaging Utility *14-3*
Step Three: Enter Package Name *14-3*
Step Four: Select Design Options *14-3*
Step Five: Gather Design Data *14-4*
Step Six: Select Workspace Options *14-4*
Step Seven: Review Selections *14-5*
Step Eight: Packaging Options *14-5*
Step Nine: Finish *14-6*

Opening a MicroStation V8 Package (.pzip) File 14-7

Extracting a Package File 14-8
Step One: Locate Package File *14-8*
Step Two: Open the Package File *14-8*
Step Three: Set the Location for Extraction of Files *14-8*
Step Four: Extracting the Package File *14-8*
Step Six: Finding the Extracted Files *14-9*
Step Seven: Opening, Moving or Copying the Extracted Files *14-9*

MicroStation Archiving Procedures (prior to V8) 14-10
Extracting An Archive 14-11
Step One: Start Utility *14-11*
Step Two: Open the Archive *14-11*
Step Three: Select Files to Extract *14-11*
Step Four: Extract *14-11*
Step Five: Adjust Settings *14-12*
Step Six: Preserve Date and Time *14-12*
Step Seven: Set the Destination *14-12*
Step Eight: Close the Archive Window *14-14*

CHAPTER 15 USING ADDITIONAL SOFTWARE 15-1

Using Estimator 15-2
Using Estimator 15-3
Introduction *15-3*
Step One: Getting into Estimator *15-3*
Step Two: Starting a new Estimator Project *15-3*
Step Three: Adding items to the List *15-5*
Step Four: Editing Existing Data *15-7*
Step Five: Printing and Saving *15-7*
Project Work Type Codes *15-8*
Additional Information *15-9*

File Transfer Using the FTP Site 15-10
General Information 15-11
General Rules of Thumb! *15-11*
Using FTP 15-12
Step One: Open FTP Software *15-12*
Step Two: Browse and Push Files to FTP *15-12*
Sending Links in Email Messages (Optional) 15-14
Step One: Type address to FTP in email *15-14*
Step Two: Test the Link *15-14*
Step Three: Add Subject Line and Send *15-14*

Using AutoTrack – Turning Radius Software 15-15
AutoTrack Installation 15-16
Introduction *15-16*
Step One: Browse to Folder *15-16*
Step Two: Launch Setup *15-16*
Step Three: Adjust IP Address *15-16*
Step Four: Update Advise *15-17*
Step Five: CADD Configuration *15-17*
Step Six: Finishing up *15-17*

Using AutoTrack (Basics) 15-18
Introduction *15-18*
Open MicroStation *15-18*
Create a New Drawing *15-18*
Load AutoTrack *15-18*
Set Default Vehicle (Optional) *15-19*
Set Drawing Settings *15-19*
Start AutoTrack Tutor *15-19*
For More Assistance, Read the Manual *15-20*
View an AutoTrack Demo (Optional) 15-21
Step One: Start Demo *15-21*
Step Two: View at Your Leisure *15-21*
Using AutoTrack's Manual and Help 15-22
AutoTrack On-Line Manual *15-22*
AutoTrack's Webpage Knowledge Base *15-22*

Mapping A Network Drive 15-23
Step One *15-23*
Step Two *15-23*
Step Three *15-23*
Step Four *15-23*

CHAPTER 16 STANDARDS 16-1

U.S. Customary Scales..... 16-2
Settings Manager Scales 16-3
Overview *16-3*

Level Structure..... 16-5
Roadway Level Structure 16-6
ROW Level Structure 16-8
Structural Detailing Levels 16-9
Public Hearing Levels 16-10

Line Styles..... 16-15
MDOT Standard U.S. Customary Linestyles 16-16
MDOT Standard Metric Custom Linestyles 16-22
Structural Linestyles 16-27
Samples *16-27*
Using Custom Linestyles *16-27*
Tweaking Line style Size *16-28*

Cell Libraries 16-29

MX String Labels..... 16-83
MX String Labels 16-84

Text 16-91
Accessing Custom Symbols *16-91*
The Degrees Symbol *16-91*
Font 32: DOT_ENG *16-91*
Font 123 DOTITALICS *16-92*
Font 229 (Verdana) *16-93*

CHAPTER 17 FINALIZING A PROJECT 17-1

Project Wrap Up 17-2

Re-numbering Utility 17-3
Overview 17-3
Step One: Start Re-numbering Utility Program 17-3
Step Two: Arrange Files 17-3
Step Three: Renumber Files 17-3
Coordinate ROW Plans or Other Plans 17-3

Border Information Macro 17-5
Overview and Benefits 17-5
Step One: Launch MicroStation 17-5
Step Two: Select a Numbered File 17-5
Step Three: Start Macro 17-5
Step Four: Single or All 17-5
Step Five: Review List 17-5
Step Six: Process Drawings 17-6

Cleanup MSTA Directory 17-7
All Projects (In-house, Regional and Consultant) 17-7
Delete Temporary files 17-7
Delete Old Folders 17-7

Final Plan Submittal to Contracts 17-8

Final Printing 17-9
Send Title Sheet for Signatures 17-9
Scan the Title Sheet and Others 17-9

Create a Multi-page PDF 17-10
Overview 17-10
Batch Printing to a Multi-page PDF 17-10

Adjust and Print the Multi-page PDF 17-13
Overview 17-13
Replace Title Sheet and Others 17-13
Rotate Vertical Pages 17-14
Save the PDF Document 17-15
Print to OCETDS800 17-15

Secure MicroStation Drawings 17-18

Activate Design History 17-19
Overview 17-19
Step One: Open Batch Process 17-19
Step Two: Select Command File 17-19
Step Three: Add Files 17-20
Step Four: Select All Files 17-20
Step Five: Process Files 17-20
Step Six: Review Selection – Click Process 17-21

MicroStation Packager 17-22
Overview 17-22
Step One: Start MicroStation 17-22
Step Two: Create New Package 17-22
Step Three: Enter Package Name 17-23
Step Four: Select Design Options 17-23
Step Five: Select Project Files 17-23
Step Six: Unselect Workspace Options 17-24
Step Seven: Review Selections 17-24

Step Eight: Package Options *17-24*
Step Nine: Finish *17-24*
Step Ten: Extract Archive to Contracts Folder *17-24*
Step Eleven: Notify Contracts *17-25*

CHAPTER 18 CHANGES DURING ADVERTISING (AMENDMENTS) 18-1

Working With Amendments 18-2

Amendments Overview 18-3
Overview *18-3*
Edits *18-3*
Incrementing Sheets *18-3*
Place Copies with Originals *18-3*
Use files in Workgroup's MSTA Folder 18-4
Overview *18-4*
Saving the Files – Commit Design Changes *18-4*
Adding Elements with the Settings Manager *18-5*
Add Revision Triangles *18-5*
Revision Clouds *18-6*
Signature Blocks *18-6*
Additional Sheets *18-7*
Rename and Copy Files to Contracts Folder *18-7*
Batch Printing to a Multi-page PDF *18-8*
Print Amendments *18-8*

CHAPTER 19 AS BUILT DRAWINGS 19-1

Change Orders/As Builts 19-2

Overview 19-3
Overview *19-3*
Retrieve the Latest Plan Set 19-4
Overview *19-4*
Copy Contracts Folder Contents to Const/MSTA Folder *19-4*
End Result *19-4*
Change Order/As Built General Workflow 19-5
Overview *19-5*
Launch MicroStation *19-5*
As-Built Settings Manager *19-5*
Making Corrections 19-6
Overview *19-6*
Saving the Files – Commit Design Changes *19-6*
Title Sheet/Others *19-6*
Editing the Proposed Design *19-7*
Initial Borders *19-9*
Renaming the Drawing Files *19-10*
Batch Printing to a Multi-page PDF *19-10*
Printing As-Builts *19-11*
Create a MicroStation Package *19-11*
Final Review *19-11*
Distribution of Plans *19-11*

CHAPTER 20 DIGITAL INTERPLOT 20-1

Using MDOT E-Plans Archive 20-2
About the E-Plans Archive 20-3
Overview 20-3
Vault Plans 20-3
Property Plans 20-3
Getting Started 20-4
Accessing the Web Page 20-4
One Time Installation 20-4
Browsing an Archive 20-6
Simple Browsing and Viewing 20-6
Viewing a Selected Sheet 20-7
Advanced Searching 20-8
Measuring a E-Plan Image 20-11
Overview 20-11
Configure Ruler 20-11
Measuring Distance 20-12
Measuring Area 20-13
Plotting (Printing) a Selected Sheet 20-14
Overview 20-14
Plot to Form 20-14
Place the shape 20-15
Using a Document Pool 20-16
Overview 20-16
Add Single files to the Document Pool 20-16
Add Multiple files to the Document Pool 20-16
Removing Documents from the Pool 20-18
Printing Documents in the Document Pool 20-19
Saving An Image to Disk 20-21
Saving a JPG Copy of Image 20-21
Display Fix 20-22
Overview 20-22
Add Windows System Variable 20-22
Data Field Dictionary 20-25
Fields in Vault Plans Search Page 20-25
Sheet Fields 20-26
Other Fields 20-27

Portable Plan Set 20-28

Indexing an Archive 20-29

Plotting to an Archive 20-30

Chapter 1 General Procedures

This chapter offers an introduction to the MicroStation working environment you'll find at the Maine Department of Transportation. If you are new to MicroStation, you'll find some helpful references about tool locations and document management. If you have previously used MicroStation, you'll also find some helpful hints, since we have customized our user interface to increase productivity.

This manual is to be used in conjunction with the Bridge Plan Development Guide and the Highway Design Guide. Please refer to these other documents for standard plan package requirements.

HOW TO USE THE MANUAL

KEEPING YOUR MANUAL UP TO DATE

Users Responsibility

It is the MicroStation user's responsibility to keep their manuals up-to-date. When an area of the manual has been modified, we will recommend replacing the whole chapter affected by the change. This may require replacing the Table of Contents also. The MaineDOT internet website will contain individual chapters available for downloading. We will be adjusting the dates of the chapters as they are revised and add a note as to what specifically was changed within the chapter(s).

We will be sending the users a pop-up message, via the "Message of the Day", indicating which chapter(s) has been modified.

Message of the Day

The "Message of the Day" is a Visual Basic program that we use to send important messages to MicroStation users. If a message was sent to you, read it to see if it affects you. Please do the recommended action if any is required. Clicking *OK* will remove the message and will not display it again. If you do not have time to read the message, hit *Cancel* and the message will appear again when you enter MicroStation. A typical message might ask you to run your Update Utility, let you know if a plotter is working or tell you that the Manual has been updated. Try to treat these messages as high importance as we wouldn't be sending them otherwise.

Website Location

The updated MicroStation Manual and our configuration files for MicroStation are available on the internet for both in-house employees and the consultant community. The address to the individual chapters of the manual is as follows: http://www.maine.gov/mdot/cadd-support/microstation/mstamanualcontents.php . Check the date of your hard copy with the chapters on the internet. This is another way to find out if you need to update a chapter. Keeping your manual up-to-date will ensure that a reference to another portion of the manual is accurate.

Sending Requests via E-mail

A user can print out the new chapter(s) to a local printer or photocopier, however if you want it to have 3 hole reinforced paper, you will have to print it by other means. The MDOT reproduction room is also going to take requests from individual users or bulk request from Programs or Regions. We are providing a link to their general email account so you can tell them the chapter(s) that you wish to have printed, the type of stock to print it on (reinforced - three hole punch) and a distribution request. Email requests to Repro.Mdot@maine.gov .

USING THE TABLE OF CONTENTS AS A QUICK PUNCH LIST

We have had requests to make quick To-Do list for some of the Chapters. We have added a few here and there, but not throughout the entire manual. This doesn't mean that you shouldn't read and follow all directions. Once you get familiar with a process, we suggest that you use the Table of Contents as a quick punch list for any give chapter. In most cases, the important steps are outlined in the table. If a step is unclear, open to the page and read more thoroughly.

USING THE ON-LINE MANUAL

Overview

We have created a PDF document of the entire MicroStation manual and have made it available for in-house and consultant use. Many people prefer hard copies of manuals, however the PDF document provides more functionality.

Opening from within MicroStation

The online manual can be activated from within MicroStation by clicking on the icon that looks like a book with a magnifying glass on it (Figure 1-1).

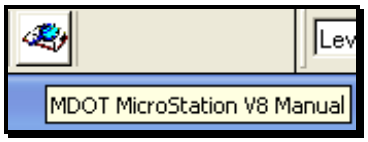


Figure 1-1: MicroStation On-Line Manual Icon

This will kick off your PDF reader and open the manual. If you can foresee needing the manual for offline work, consider doing a "Save As…" and create a local copy on your PC/laptop.

Searching the On-line Manual

Like with most software, type **Ctrl+F,** click the binoculars or select **Edit>Find (on This Page)** and it will bring up the *Find* tool. Enter the topic you are searching for and Adobe will show you every occurrence of the word you are searching for, starting with the Table of Contents. Select the one that best fits your needs.

Following Cross References

In many places in the manual, we refer you to another topic for more information. With a hard copy, you have to browse to the chapter and page number. When using the on-line manual, you simply click the link to go to the page.

HELP WITH MICROSTATION

Internal Help Program

Overview

As with most programs, MicroStation has an internal help program that is very useful and detailed. There are many options in using help. Selecting **Help** from the *main menu* bar with expose these options.

Contents

Help>Contents is similar to many Microsoft html Help products. It has a Contents, Index, Search and Favorites tabs.

Tool Index

This option opens a tool specific dialog and allows a user to search based on a tool selection. It still ultimately open the larger help document but helps narrow the search.

Tool Tips

With this option checked on, hovering the pointer over a tool icon displays a tool tip, which is a yellow rectangle with text that provides the name of the tool.

Tracking

Turning on **Help>Tracking** will display help for whatever tool or view control you pick. This is a good option for new users because it will display all possible options for using the specific tool.

CADD Support Personnel

Phone

Please feel free to call your support personnel at any time when help is needed. We may refer you to a portion of this manual for detailed instructions or guide you through the task at hand by using the phone and Microsoft's Remote Assistance software. We can view the problem, take over your mouse and provide help.

Remote Assistance

Remote assistance can be kicked off through an email to us or we can *Offer Remote Assistance* to you.

Send Us an Email

Go to **Start>Programs>Remote Assistance** or **Start>Help and Support** and select **Invite Somone To Help You**. Pick Microsoft Outlook as the way you'd like to contact us and type in our email address or use the Address Book to select the name from the list. Follow the rest of the promts, and include a password. Place a call in to the person you sent the email to and tell them the password.

Call and we'll Offer Assistance

We can *Offer Remote Assistance* in the event you need a hand. Give us a call and we'll do the rest.

INTERFACE OVERVIEW

GUI: THE GRAPHICAL USER INTERFACE

There are a couple of places that MicroStation will offer instructions, read out data, and generally try to be helpful. These are the **Tool Settings Window, Status Bar and Message Center**. Make sure you know where these things are and check back with them often.

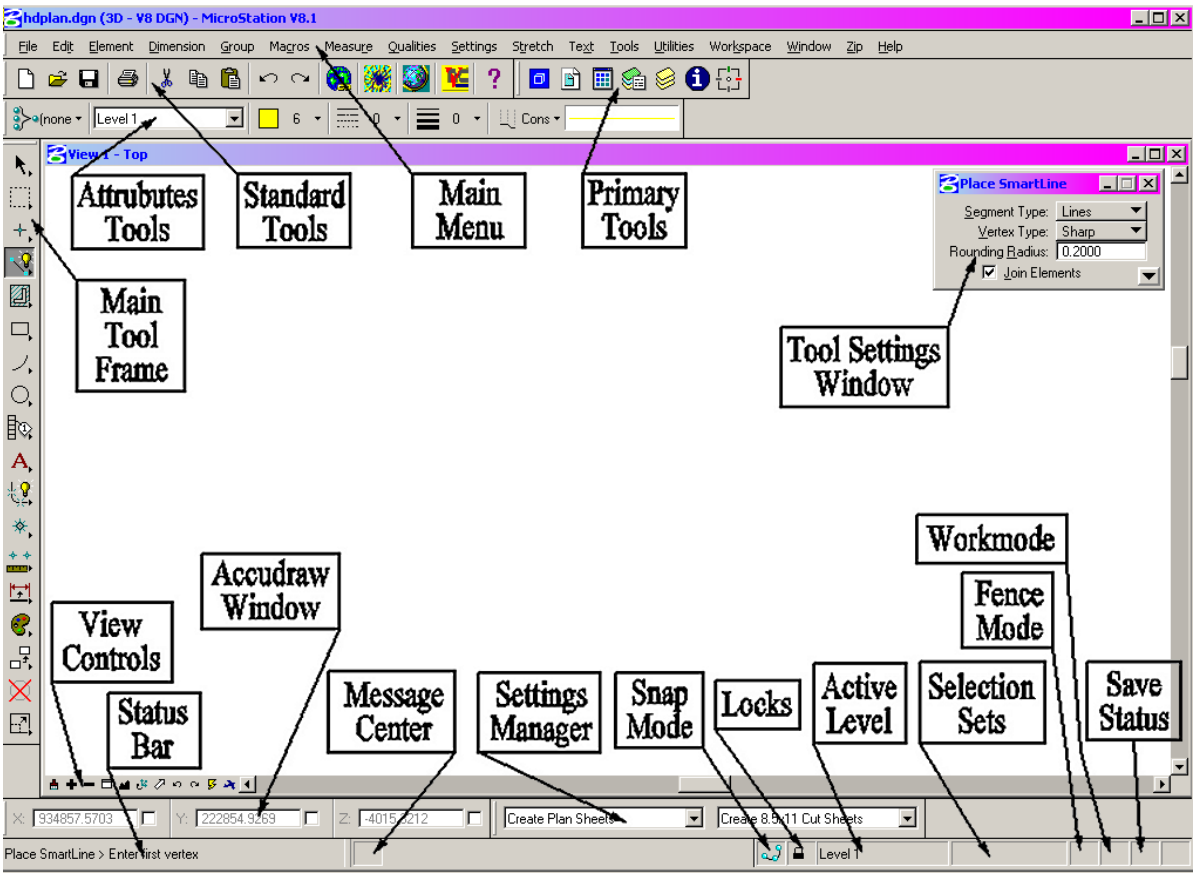


Figure 1-2: Interface Components

How do I get back Tool Bars that are missing?

If any aspect of the GUI has been closed, you're probably going to need to get it back. Every item outlined above can be closed except for the **Menus** and the **Status Bar**.

The **Attributes Tools** can be opened from the **Menus** by choosing **Tools>Attributes**.

The **Primary Tools** can be opened from the **Menus** by choosing **Tools > Primary**.

The **Standard Tools** can be opened from the **Menus** by choosing **Tools > Standard**.

The **Main Tool Frame** can be opened from the **Menus** by choosing **Tools > Main > Main**.

The **Tool Settings Window** can be opened by simply activating any command from a toolbox or menu.

The **Window Open/Close** button bar is used to open and close MicroStation Views. (The

words “View” and “Window” are used interchangeably in MicroStation.) This button bar can be activated from the **Menus** by choosing **Window > Views > Dialog**.

The *Settings Manager* can be opened from the Menus by selecting **Settings > Manage**. Task-specific *Settings Managers* can be opened from **Settings > DOT SetMgrs**.

With our in-house customization we have specific settings managers auto loading based on file naming convention.

AccuDraw can be opened by pressing the **Toggle AccuDraw** button on the **Primary Tools** bar.

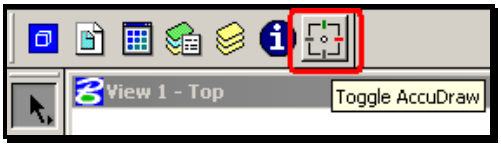


Figure 1-3: AccuDraw Button

How do I retrieve missing tools on a Tool Bar?

I have my tool bar up but it is not showing all the tools. Well in MicroStation V8 they have made the GUI more windows oriented. You can now right click on any tool bar and remove from display any of the dockable tools.

MOUSEING

Standard Buttons

Remember that the three buttons of the mouse are called **Data**, **Tentative**, and **Reset**. Here is a brief table of mouse button functions:

Left Button	Middle Button	Right Button
Data	Tentative	Reset
Accept	Snap	Reject
Yes	Maybe	No

Troubleshoot the Middle Button

It is possible that your Middle Button may not be snapping. From your main menu, select **Workspace > Button Assignments**. This will open the **Button Assignments** dialog (Figure 1-4).

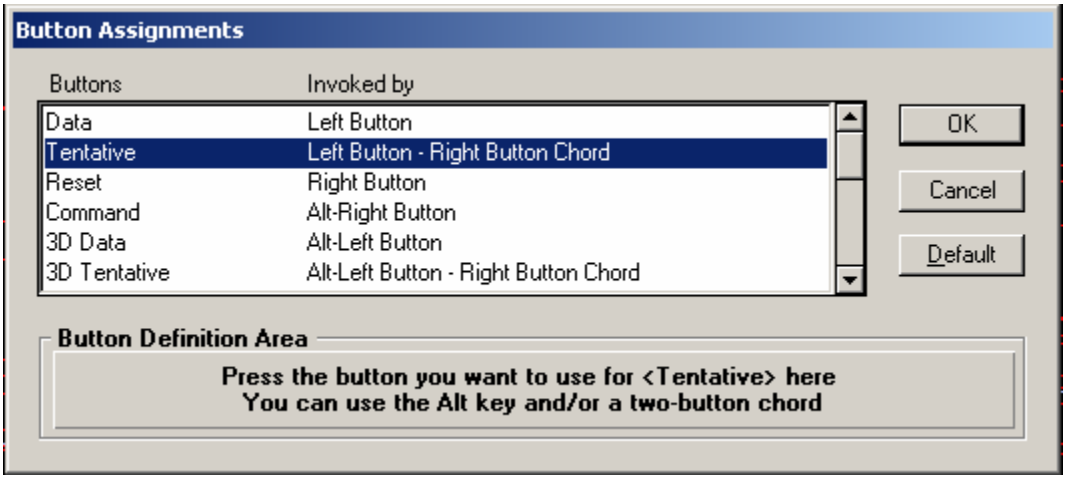


Figure 1-4: No Middle Button Assigned

Highlight the **Tentative** row. Notice the **Invoked by** column is not set to **Middle Button**.

Put your cursor in the **Button Definition Area** and hit your middle button. You should see the **Invoked by** column change to **Middle Button** (Figure 1-5)

- If you are using a 2 button mouse you can setup the tentative by following this same procedure and either holding the **Alt** button when hitting your **Left** mouse button or hitting your **Left** and **Right** mouse buttons simultaneously in the **Button Definition Area**.

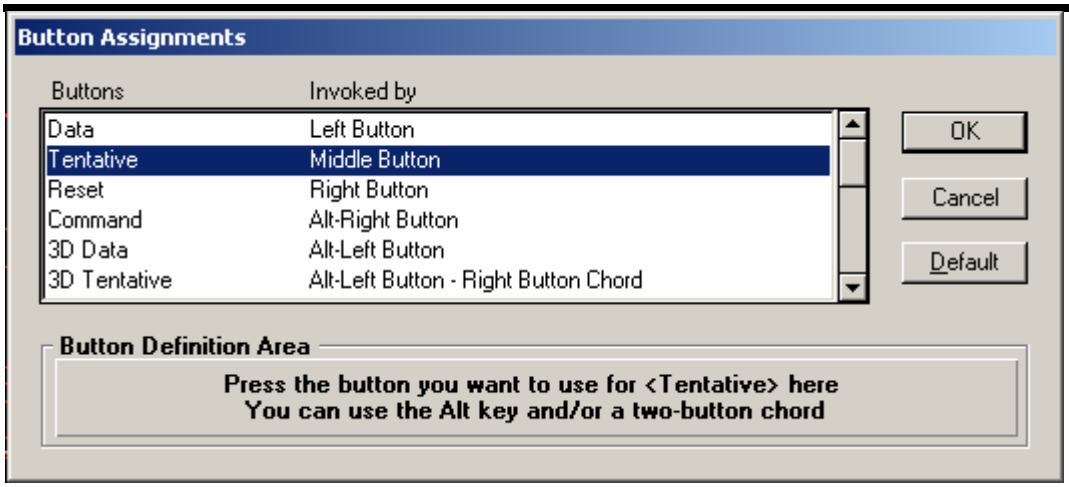


Figure 1-5: Middle Button Correctly Assigned

Press the **OK** button to preserve the assignment.

Using a Wheel Mouse

If you are using a wheel mouse you need to establish the wheel as a **Middle Button** in your mouse properties of your **Operating System (Start>Settings>Control Panel>Mouse)**.

There are some settings that you can set in your preferences for controlling the zoom and panning of your wheel mouse. You can find these setting by going to **Workspace>Preferences…** in the main menu. Select **Mouse** on the left side of your **Preferences** under your **Category** options. Check the different options out to the right and see what best fits your needs. (Figure 1-6)

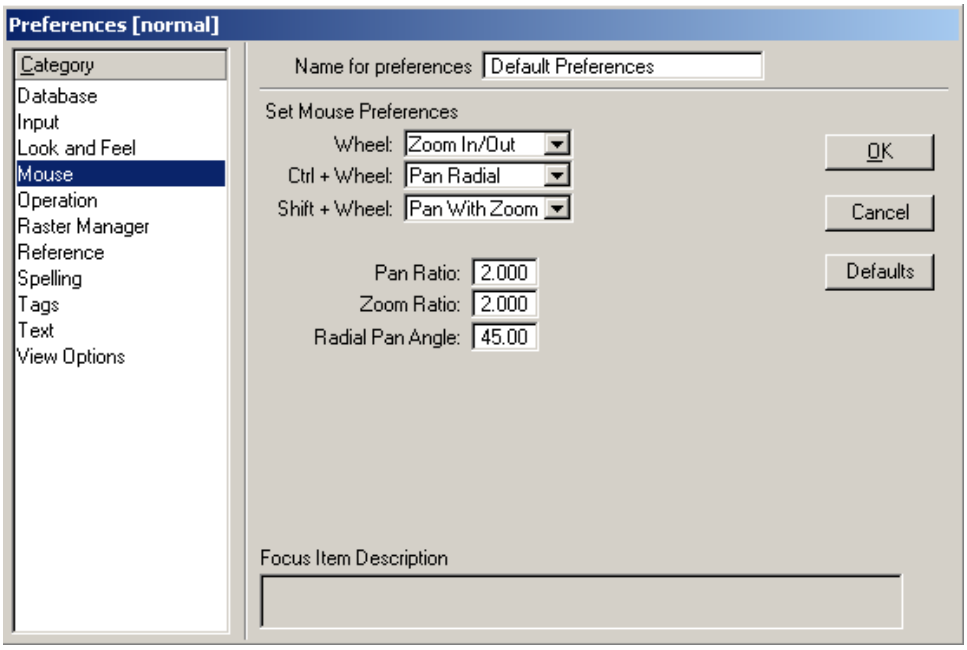


Figure 1-6: User Preferences

MENU OVERVIEW

Introduction

Our menu structure lets you run MicroStation from the keyboard. To let you keep one hand on the mouse, we've tried to maximize the keystrokes accessible with your left hand only.

The Principal

Menu items can be chosen with your mouse or from your keyboard. Notice the underlined letters in the menu (File, Element, etc.) Open any menu by typing the **Alt** key, then typing that underlined letter. Then type the underlined letter of a command in the menu.

Organization: The Top Level

Commands have been grouped together to make them quick to run and easy to find. Let's look at the menu structure, including important modifications we've made to existing menus as well as menus we've added:

The **File** menu has been modified to allow access to custom sheet-creation routines. The Reference (DOT) option has also been enhanced to give quick access to common Reference commands.

The **Edit** and **Element** menus have only minor changes.

The **Dimension** menu has been added to give quick access to some common Dimension settings.

The **Group** menu helps place and manipulate groups of objects. Using this menu, you can control fences and *graphic groups* and access tools for element selection sets as well.

The **Macro** menu is used to launch custom applications and enhancements.

Use the **Measure** menu measures distances, angles, areas and volumes.

The **Qualities** menu matches and changes color linestyle and other attributes.

The **Settings** menu has been modified to give you access to a wide range of MDOT *Settings Managers*, organized by task.

The **Stretch** helps you modify, extend, clip and trim elements.

The **Text** menu places and modifies text.

The **Tools**, **Utilities**, **Window**, and **Workspace** menus have only minor changes.

The **Zip** menu helps you place lines, shapes and cells. It also lets you move, copy, and modify, as well as hatch and delete.

Organization: The Next Level

To keep things simple we've tried to keep the menus similar. The **Group** and **Zip** menus have some items in common: **Copy**, **Move**, **Delete**, and **Scale** are in both menus. They also have similar entries for **Mirror** and **Rotate**.

For commands that are unique, we've tried to balance logic with convenience. On the convenience side, you can run the "place line" from **Zip > Zipline**. "**Zipline**" isn't a familiar word, but it's convenient to "place line" with the keystroke **Alt+Z, Z**. On the logical side, there's the "Measure Length" command. **Alt+R, L**. The **Alt+R** opens the **Measure** menu, and the **L** chooses "Length" as an option.

Organization: Submenus

Some commands have a lot of options you might want. With "Rotate", you might want to rotate by a specific angle. Then again, you might want to eyeball it. The **Rotate** item under both the **Group** and **Zip** menus has both of these options. You can "**Rotate by Angle**" or "**Rotate by 3 Points**".

Conclusion: The Pros and Cons

With this system, you can execute virtually every MicroStation command with a two or three letter shortcut that can be typed with one hand. If you forget the shortcut, you can remind yourself just by browsing through your menus.

FILE MANAGEMENT

NETWORK OVERVIEW

MicroStation Customization files and Drawing Files:

The master MicroStation customization files are on the network in a blind share. This means that they are in a secure location that isn't normally seen when mapping a drive letter. All users have a local copy of the customization on their C: or D: drive. Updates to the configuration are handled with an Update Utility. This utility does a date check of your local customization and updates files if changes were made to the master copy. There is one folder called **!msproj** in our configuration that requires access to the network. The folder is located on the **\\dot0dta1fscadd1\pcpin1\msworksp** and is mapped through the **Y:** drive**.** This **!msproj** folder contains project specific information that are used as variables. These variables store information such as town name, federal project number, street or route number and user names of those who have worked on the project. A copy of this folder is on your C: or D: drive for offline work. As new PIN's are created, you may need to update this folder for offline work so your project shows up in the list.

The master copies of all drawing files are located on the network on **\\dot0dta1fscadd1\pcpin1\.** This folder has been "mapped" to your machine as your **Y:** drive. This folder contains all of your design/detailing (project) information in the form of MicroStation files (.dgn).

Regional Office users create sync copies of their project drawing files to their local hard drive because the network speed is diminished due to the geographical location and in some cases offline work. In this case, the files are setup in a briefcase "PIN" folder at the root of their C: or D: drive.

OPENING FILES

You should always launch MicroStation from either a desktop icon or the Start menu. The first dialog to open is the **MicroStation Manager**.

At the bottom of this dialog you will notice the **Workspace** area.

User should be set to **normal**.

Interface should be set to **mdot**.

Project should vary depending on what project you are working on. When you click on the **Project** picker, you should see a list of all active PINs. Pick your PIN from this list and MicroStation will take you directly to the design file directory for your Project. This is important because MicroStation will work smoother if it knows what project directory it should look to by default. If this is not working, please contact your CADD Support section.

Select a file to open from the left side of the **MicroStation Manager** and press **OK**.

ⓘ ***You can open multiple MicroStation sessions while working on a single project (i.e. Plan view and Cross Section), however if you open a file having the same name (i.e. two highway.dgn's) in two different project PINs, you may loose some work. You should always close all sessions of MicroStation prior to switching between projects.***

MAKING NEW FILES

Setup

This macro is used to make new design files that meet MDOT standards. It will create them only in the same folder as the MicroStation design file that is open when the macro is run. To create new files for a specific project, launch the project and open an existing file in the project's folder.

Launch the Makesheetz macro

Launch the **makesheetz** macro from your main menu by selecting **File > Makesheetz**. This will open the **File Prefix Dialog** (Figure 1-7).

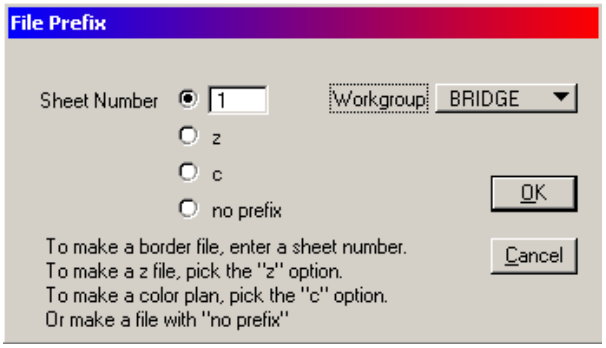


Figure 1-7: File Prefix

Choose Preliminary Information

In the **File Prefix Dialog**, you can choose to make a **numbered** sheet, a **z**-file, a **c**-file or a file with **no prefix**.

Numbered Sheets contain borders. These are the drawings that comprise the plan set for delivery to Contracts. They are the sheets that get plotted. Choose a **Sheet Number**.

Z-Files are the files where detailing work gets done. They typically get referenced into Numbered Sheets for plotting.

C-Files are the files where coloring is done for visualization purposes.

If you do not want a number, a "c" or a "z", you can also choose "no prefix."

- Notice you can choose a different **Workgroup** here. This option starts with your default workgroup. You can change this to create a file that would normally be made by another Workgroup.

When you have set your options, press **OK**.

Choose a File Type

This will bring up the **Create File of Type…** dialog (Figure 1-8).

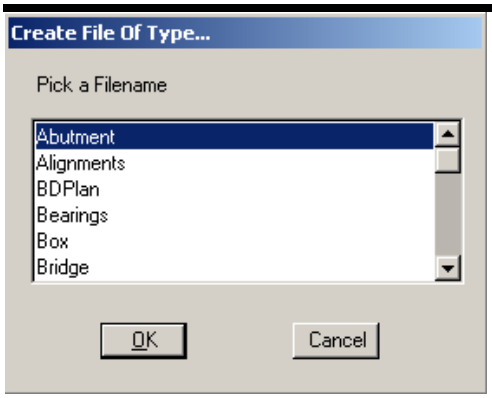


Figure 1-8: Create File of Type

Scroll down the list to find the file type that you want to create. Select it and press **OK**

Final Filename Editing

This will bring up the **Make File** dialog (Figure 1-9).

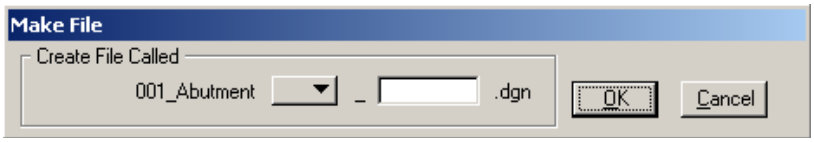


Figure 1-9: Make File

You can edit the entry in the **Create file called** box.

Choose a number from the pull down for multiple drawings of the same type: (Figure 1-10) or type a suffix into the text entry box (Figure 1-11).

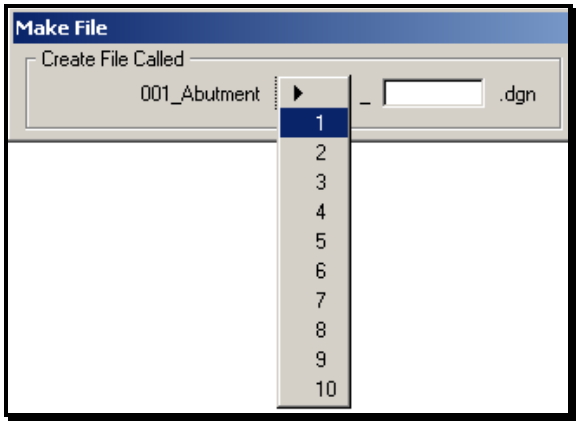


Figure 1-10: Index Picker

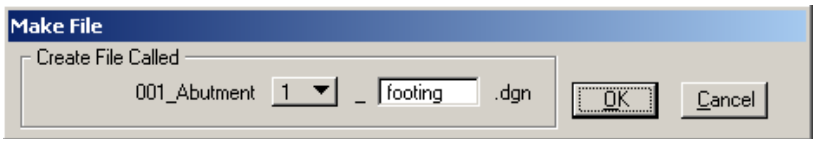


Figure 1-11: Suffix

Press **OK** when you have finished editing your filename.

- The macro will automatically enter the underscore character before your suffix. If you do not type a suffix in, it will not insert an underscore.

End Game

This will create the new file based on appropriate seed files and place the correct border cell, where needed. It will then opens up the **File Prefix** dialog again and prompt you to create another file (Figure 1-12)

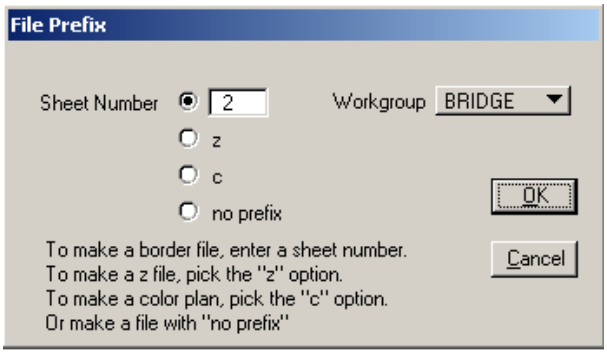


Figure 1-12: File Prefix Again

Press **Cancel** if you are done making files, or repeat these steps to make another file.

Safety Features

This macro will not automatically overwrite existing files, if you happen to tell it to create a file that already exists. It will first prompt you (Figure 1-13).

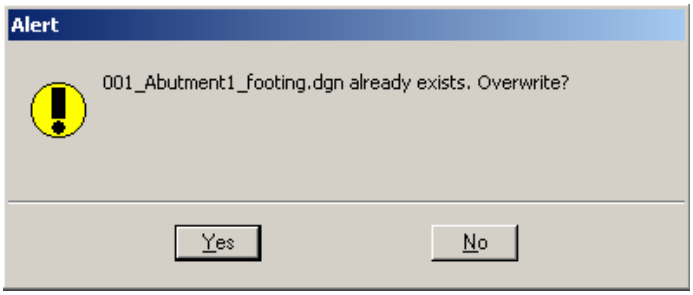


Figure 1-13: File Overwrite Alert

If you press **No**, the macro will bounce you right back to the **File Prefix Dialog** to let you pick a new sheet number.

FILE NAMES

The file names are important because the automatic sheet numbering capability of MicroStation relies on the first three digits of the file name. We all have had plots that came out with “XSE” in the “sheet number” box on your cross section plot. This is because the filename of your cross section you plotted was something like XSECTMC10_002.dgn. File names are also important because MicroStation automatically loads the Settings Manager that should be used based on the drawing type.

ⓘ ***Do not manually edit the sheet numbers on any of your drawings. Allow the automated procedure to handle this.***

Consider using the default number that displays, based on your workgroup, when cutting plan sheets. This will leave room for sheets that will go before the plans and numbered in the beginning of the project, for example:

001_title.dgn

002_typical_01.dgn

003_typical_02.dgn

004_estimate.dgn

005_drainage.dgn

006_notes_general.dgn

007_notes_construction.dgn

008_??.dgn

009_???.dgn

010_????.dgn

011_HDPlan1.dgn

The renumbering utility can be used again and again if necessary. Don’t worry if they aren’t in the correct order until final print.

ⓘ ***Avoid having sheets with the same prefix and suffix in their filename. Add a suffix to sheets to differentiate the like drawings (i.e. Typical_01.dgn, Typical_02.dgn). The sheet renumbering utility doesn’t like having two drawings with the same prefix or root filename and suffix. You can use Windows Explorer to rename any identical root filenames to add a suffix or you can let the renumbering utility give you the warning and start rebuilding the list to the right.***

SHEET RENUMBERING UTILITY

Introduction

This utility was developed to quickly rename/renumber your plot drawing files in the event that a sheet is added or deleted from a plan set. It allows you to prioritize the plan set based on the order of files in the list.

Operating the Utility

To use this utility click on the icon on your desktop (Figure 1-14) or by selecting **Start>Programs>MDOT Utilities>MDOT MicroStation Sheet Numbering Utility.**

Figure 1-14: The Tao of Renumbering

Next you will need to click your way to the **PIN** directory that you are interested in by changing the drive letter in the lower left corner, above the **Renumber Plot Files** button, to **y:\\dot0dta1fscadd1\Pcpin1.** Double click on the **pin** folder and select the desired **project identification number (pin).** You should keep double clicking on the sub folders to get yourself to your workgroups MSTA folder as shown in Figure 1-15.

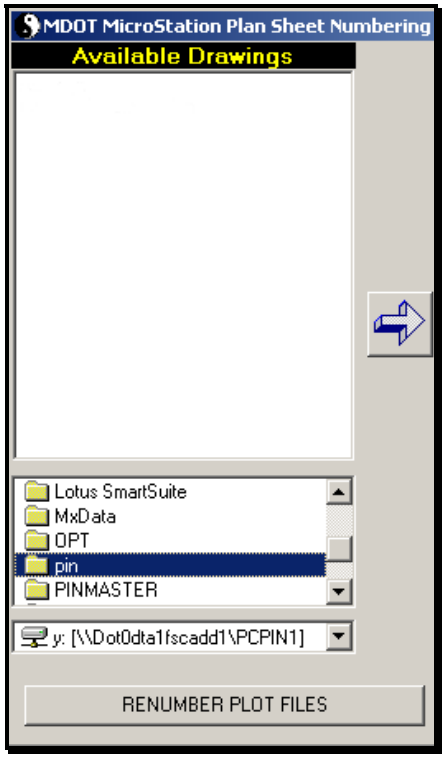


Figure 1-15: Browsing for Files.

Once there, you will see the list of drawings under the heading **Available Drawings** to the left and the utility automatically creates a list of all your numerical prefix drawings to the right under the **Listing of Sheets** category (Figure 1-16).

- If you have drawings with the same prefix numbers the utility will not populate the file names under the **Listing Of Sheets** beyond the duplication. You can either use *Windows Explorer* to rename individual prefixes or just populate the **Listing Of Sheets** beyond that point.

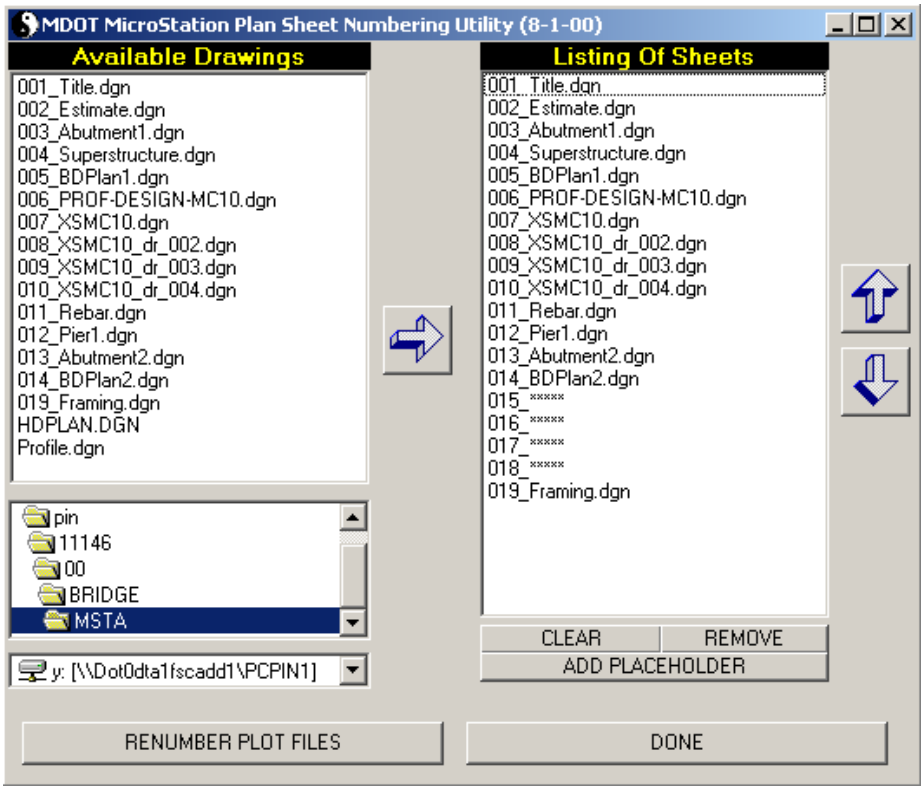


Figure 1-16: Renumbering Interface

Prioritizing Plan Set

Now we are ready to prioritize the drawing list to create the correct numbering of sheets for the final plan set. You may have noticed that the list to the right side of the utility shows place holders between the original numbered drawings you had created, that's O.K. just simply highlight each place holder *(015_xxxx)* that you don't want and hit the Remove button or hit the Clear button and remove all files so that you can rebuild you list of files by highlighting and using the arrow in the middle to push the file back to the right.

ⓘ ***The CLEAR button doesn't give you a warning! If you hit clear, this will remove all of the numbered prefixes from your drawings! You will need to locate and rebuild them.***

You have the ability to add placeholders between drawings to create a gap in your sheet numbers in case there are sheets being inserted from other workgroups. You can move a selection of files up and down with the arrows to the right of the utility to prioritize your plan set.

Once you have done this, go ahead and hit the **Renumber Plot Files** button and you should see your file names renumbered and the list to the left renamed as shown in Figure 1-17.

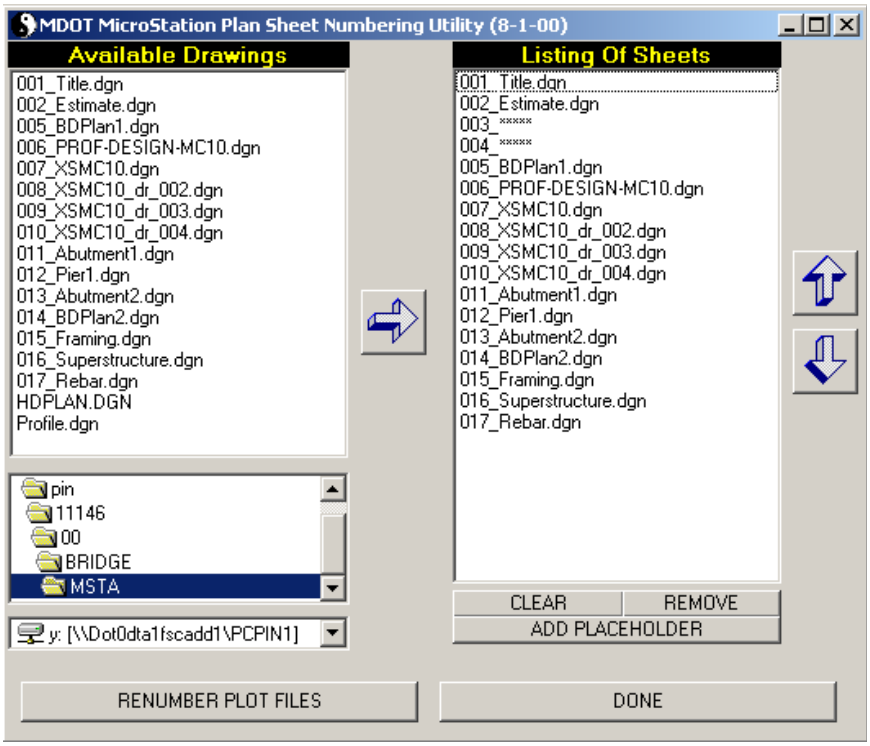


Figure 1-17: Renumbered Files

Press **Done** when you are finished.

Precautions

This utility is set up to look for files within your folder. It is necessary that all file names are unique not only in their root filename and suffix, but in their prefix as well. If this requirement isn't met then you will experience problems activating this utility and/or renumbering when in the utility.

The utility reverses the order of files when they are the first files pushed into the “Listing of Sheets”. Add a couple of place holders and click on the last place holder prior to pushing a large grouping of sequential files into this area.

ⓘ ***If you get an error when first opening the utility, it may be because a PIN number that was previously renumbered no longer exist. To fix this problem, browse to your C:\windows directory and open the control.ini file. Delete the InitDirectory line in this file and the path to the PIN that it refers to. Reopen the Sheet Renumber Utility: (Figure 1-18)***

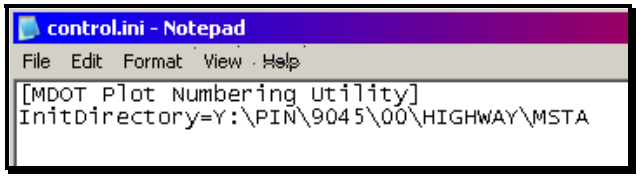


Figure 1-18: Control file

PCF EDITING

Discussion

PCF Files - "Project Configuration files" are files that contain project specific information that will be used by MicroStation and databases that can extract project information from lines of text in the file.

Open one of your prefix numbered drawings.

Edit PCF File

Go to **Workspace > Edit Project Data (PCF)** to revise or add information about this project. A list of variables will appear in a dialog.

ⓘ ***If you get the warning that says "Close MicroStation and choose a project that is consistent with your file location", there are two thing it could be.***(***Figure 1-19***)

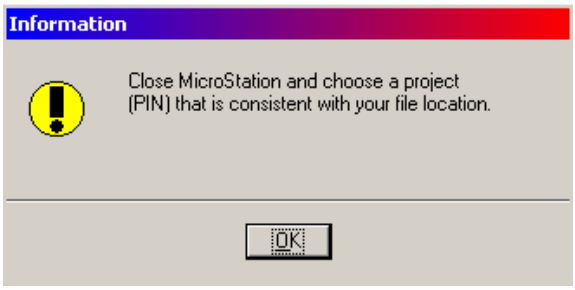


Figure 1-19: Information Dialog

1. You may have entered MicroStation improperly. You must open MicroStation by clicking on the **MicroStation** icon on your desktop and selecting your **PIN** number in the project pull down (this is in the lower portion of your *MicroStation Manager* window. This selects the PCF file that is associated with your PIN number) If you have the wrong project specifics on your plot, this is a BIG clue that you selected the wrong PCF in the project pull down or that your PCF has bogus information in it.
2. If the line in your PCF file says "PCF_PINNUMBER = _____", and does not have a value, you will still get this warning. Simply correct this by adding your PIN number (i.e. 1234.00), saving the PCF file and restarting MicroStation.

ⓘ ***Do not enter the word "PIN" in the PCF_PINNUMBER field.***

Verify that the fields crucial to your drawing are filled in. Edit a field by clicking on the field and hit **OK**.

Another dialog will prompt you for input. Add the information and click **OK**. Figure 1-20

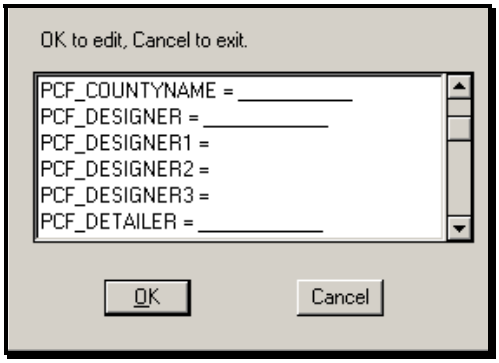


Figure 1-20: PCF Selections

When done, hit **Cancel to Exit.** Click **Yes** to save the changes.

- In the capture above, you will notice some similar selections. Due to the fact that some border drawings may contain different variables, you should enter the primary designer in both the PCF_DESIGNER and the PCF_DESIGNER1 fields. The same goes for PCF_DETAILER. Additional designer and detailer fields are there for a future border that will have the additional fields.
- If no changes were made and you attempt to save the file anyway, you will get an error. Click **OK** to bypass the error.

The macro will ask you if you would like to edit the border information. Say **Yes** to process all of the numbered drawings now or **No** to process them later using **Macros > Border Information** from the *Main Menu.* Figure 1-21

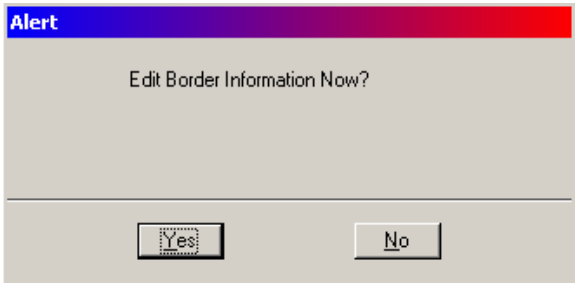


Figure 1-21: PCF Edit Alert

✓ *Refer to the Border Information Macro on page 1-27.*

BORDER INFORMATION MACRO

Discussion

The standard border cells contain variables for sheet number, total number of sheets, street name, etc. These variables begin and end with a "$" or "@".

We have a macro that will substitute your active project information into those variables.

It will also look for the first three digits of your file name and use those as your current sheet number.

This is called the **Borderinfo** macro, and you run it from your main menu by selecting **Macros > Border Information**.

The macro is capable of processing a whole folder-full of files at once.

✓ *Refer to page 1-30 for information on disabling edited items.*

Sheet Numbering

Before you run the macro, make sure your file fits naming conventions, i.e., begins with a 3-digit number and an underline.

✓ *Check page 1-22 for instructions on using the Sheet Renumbering Utility.*

Process Options

If you are running the macro from an appropriate file and project setup, you will get the **Border Info** dialog box (Figure 1-22) that offers you two options.

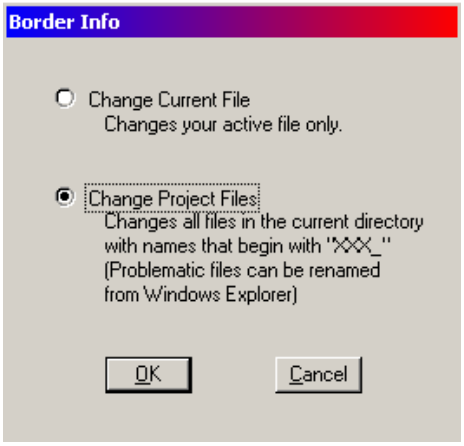


Figure 1-22: Border Info

Current File

Process your active file by picking **Change Current File**.

Project Files

Process a whole directory full of files by selecting the **Change Project Files** option. This will select all eligible files in your current directory for processing.

You will get a dialog that lists all the files that will be processed. You can browse through this list to confirm that only the files you want to process are listed (Figure 1-23).

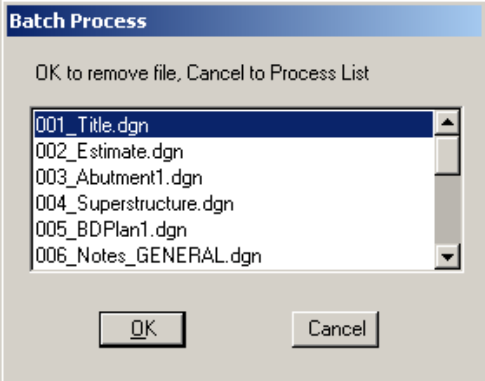


Figure 1-23: Batch Process

If you don't wish to process a certain file in the list, highlight it and press **OK**. Otherwise, press **Cancel** and MicroStation will open and process each file on the list.

- Remember that only files in your active directory that begin with a 3-digit number (followed by the underscore "_" character) will be processed.

Error Messages

When running this macro, you may get one of two error messages.

1. If you didn't pick your current project before opening the file, you'll get a prompt to "Close MicroStation and choose a project (PIN) that is consistent with your file location." This will protect you from substituting incorrect information onto a border.
2. If you are working in a file that is not properly named, you will get a prompt that explains the file naming criteria. You will get this message if you try to run the macro from a file that is not a border file or it has not been run through the Sheet Renumbering Routine.

Side Effects

The most important side effect of this macro to be aware of is that it will drop all border cells in every file processed.

- The macro may not substitute information if you don't have a standard border cell. In that case, drop the cell manually from **Qualities > Drop > Complex**.

Changing Data After the Fact

If you go back and need to change your project data, select **Workspace>Edit Project Data (PCF)**.

✓ *Refer to page 1-25 for the specific details of editing PCF files.*

Troubleshooting

If it seems like the macro is not finishing, it may be because of one of the following reasons.

1. Someone may have changed or hard coded a variable on the border.
2. You cannot use a backslash between the month and year in your PCF file.
3. Your file may be corrupt. (See your CAD administrator)
4. If there is any multiline text in the border cell the macro can get hung up.

DISABLING THE BORDERINFO SUBSTITUTION

Overview of Droplink.bas

The downside of using the **Borderinfo** macro to substitute project information onto the border sheets (**Macro > Border Information)** is that you are limited in your ability to alter the results of the substitutions.

Once the macro has run, you can edit the text as normal. However, every time the **Borderinfo** macro runs, it will re-substitute its text: potentially overwriting your custom text entry.

The **DropLink** macro has been written to allow you to "hide" your altered text, preventing the **Borderinfo** macro from changing it when it is run.

A possible good use of this is if you want to maintain a certain designer/technician name of a plan sheet then you would droplink these names so that the border information would not change them.

Setup

There are two ways the **Droplink** macro can process elements.

You can place a fence or select a bunch of elements using PowerSelector and then run the macro. The macro will process all the indicated elements.

Or, you can run the macro with no *Fence* or *Selection Set*, and the macro will allow you to pick elements one at a time to drop.

Run the DropLink Macro

From the main menu, select **Macro > Droplink**.

If you have a *Selection Set* or *Fence*, *Datapoint* to *Accept.*

Otherwise, select each element you'd like to drop the linkage from.

What Does it Do?

The **DropLink** macro removes an invisible tag from the elements you indicate. This tag is the only way the **Borderinfo** macro can find these elements to change them. Without the tag, the **Borderinfo** macro will not further alter the elements.

ⓘ ***This process is only reversible by using Edit > Undo.***

Quitting

To exit out of the macro, simply choose another command.

PLOTTING OVERVIEW

MAINEDOT PLOT DRIVERS – REGION 0

Overview

The plot driver below are located in the !ms2004conf/standards/plotdrv folder.

Plots can be sent to any plotter, regardless of its location. Due to network speed, it may be more feasible to have someone at the location send the plots.

The OCETDS600-rm312 has two paper outputs trays available. A "table" which may result with plots in reverse order (i.e. MicroStation plots – single or *Batch Prints*) or an Ascending order integrated tray on the top of the machine for plots to be sorted in Ascending order (i.e. Print Exec Workgroup or other). We have added the type of output on the plotters described below.

- The recommended printing solution is *Batch Printing* or plotting with a *Fence* for single copies of a set of drawings. For more than one copy and for better management of the order in which they are printed, it is recommended that users *Batch Print* to create a multi-page PDF and print from Adobe directly to a plotter.
  - ✓ *Refer to page 17-13 for instructions on plotting a PDF from Adobe software directly to one of the plotter listed below.*

ⓘ ***When plotting a PDF, consider sending it directly from the Adobe PDF viewer software to a plotter that is mapped to your computer. You can reverse the order (depending on the plotter it goes to) and ask for additional copies. For your convenience, we have provided instructions on mapping the various plotters below each description.***

- Removing the "US_" from the front end of the drivers description will give you the names of the METRIC plot drivers.

US_ OCETDS860-full-rm126 – Final Full Size Plotting

This option sends a full size plan sheet, which is 36" wide, to the plotter located in the reproduction room at MDOT – Augusta.

This plotter produces excellent plots and is capable of handling large batch jobs.

The exit tray is the table that will stack plans based on the order they were printed resulting in reverse order. The user is required to adjust the order. When *Batch Plotting,* click on the *Name* column to sort in decending order.

- If you need to map this printer as a Windows Printer for submitting from software other than MicroStation (i.e. Adobe, Excel, ESERI, Paint, E-Plans), click this link \\Dot0dta1psprt02 and then double click the OceTDS800-Rm126 plotter in the list.

US_ OCETDS860-half-rm126 – Final Half Size Plotting

This option sends a half size plan sheet, which is 18” wide, to the plotter located in the reproduction room at MDOT – Augusta.

The plotter has an 18” roll; therefore, no trimming is required.

The exit tray is the table that will stack plans based on the order they were printed resulting in reverse order. The user is required to adjust the order. When *Batch Plotting*, click on the *Name* column to sort in decending order.

US_ OCETDS860-long-rm126 – Long Plots (5’ – 20’)

This option sends plots longer than our normal plan sheet is tall (24”+/-). Currently, we have 4 different lengths available: 5ft, 10ft, 15ft, and 20ft. We use this in conjunction with clip boundaries of the same size to achieve a plot that is to a desired scale.

US_PLOT2FILE

This option is for creating plot files (.plt or .000). This is used in conjunction with the *Print Exec Workgroup*. The *Print Exec Workgroup* can use the plot files to create full or half size plots. Depending on where you send you plots, you may be required to print the job in reverse order.

✓ *For more information on the Print Exec Workgroup, refer to page 1-67 .*

US_ OCETDS600-full-rm312 - Full Size Check Plots

This option sends a full size plan sheet, which is 36” wide, to the plotter located in Room 312 on the 3rd level of MDOT in Augusta.

This plotter is for quick working plots and is not intended to be used for final plots or large batch jobs. Please send only 50 plots at a time to this plotter.

The plots exit on the tray table that will stack plans based on the order they were printed resulting in reverse order. When *Batch Plotting*, click on the *Name* column to sort in decending order.

- If you need to map this printer as a Windows Printer for submitting from software other than MicroStation (i.e. Adobe, Excel, ESERI, Paint, E-Plans), click this link \\Dot0dta1psprt02 and then double click the OceTDS600_Rm312 plotter in the list.

US_ OCETDS600-half-rm312 – Half Size Check Plots

This option sends a half size plan sheet, which is 18” wide, to the plotter.

It is not intended for large half size batch jobs. Please send only 50 plots at a time to this plotter.

The plots exit on the tray table that will stack plans based on the order they were printed resulting in reverse order. When *Batch Plotting*, click on the *Name* column to sort in decending order.

US_ OCETDS600-long-rm312 – Long Plots (5’ – 20’)

This option sends plots longer than our normal plan sheet is tall (24”+/-). Currently, we have 4 different lengths available: 5ft, 10ft, 15ft, and 20ft. We use this in conjunction with clip boundaries of the same size to achieve a plot that is to a desired scale.

US_OCETCS500-full-rm126 – Full Size Color Plotter

This option is for sending Full Size color plan sheets to the OCETCS500 Plotter in Room 126 (reproduction room) at MaineDOT – Augusta. This is a high quality and fastest wide format color plotter in the building.

- If you need to map this printer as a Windows Printer for submitting from software other than MicroStation (i.e. Adobe, Excel, ESERI, Paint, E-Plans), click this link \\Dot0dta1psprt02 and then double click the OceTCS500-Rm126 plotter in the list.

US_OCETCS500-half-rm126 – Half Size Color Plotter

This option is for sending Half Size color plan sheets to the OCETCS500 Plotter in Room 126 (reproduction room) at MaineDOT – Augusta. This is a high quality and fastest wide format color plotter in the building.

US_OCETCS500-long-rm126 – Half Size Color Plotter

This option sends color plots longer than our normal plan sheet is tall (24”+/-) to the OCETCS500 Plotter in Room 126 (reproduction room) at MaineDOT – Augusta. Currently, we have 4 different lengths available: 5ft, 10ft, 15ft, and 20ft. We use this in conjunction with clip boundaries of the same size to achieve a plot that is to a desired scale. This is a high quality and fastest wide format color plotter in the building.

US_HPCOLOR4

This option is for sending color plots to the HP1055CM Plotter in Room 303 on the 3rd level of MDOT in Augusta. This plot driver points to the plotter through the same print server as all the printers and photocopiers in the building.

- If you need to map this printer as a Windows Printer for submitting from software other than MicroStation (i.e. Adobe, Excel, ESERI, Paint, E-Plans), click this link \\dot0dta1psprint and then double click the PLOTCHP4 plotter in the list.

US_HPCOLORRoom303

This option is for sending Full Size plan sheets to scale or larger color plots to the HP1055CM Plotter in Room 303 on the 3rd level of MDOT in Augusta. This plotter uses a different print server than the US_HPCOLOR4. It should be used when sending for large color plots.

- If you need to map this printer as a Windows Printer for submitting from software other than MicroStation (i.e. Adobe, Excel, ESERI, Paint, E-Plans),

click this link \\Dot0dta1psprt02 and then double click the HPCOLORPLOTRM303-HPGL plotter in the list.

US_HPCOLORRoom303Half

This option is for sending Half Size plan sheets to scale or other color plots to the HP1055CM Plotter in Room 303 on the 3rd level of MDOT in Augusta. This plotter uses a different print server than the US_HPCOLOR4. It should be used when sending for large color plots.

US_HPCOLORRoom321

This option is for sending Full Size plan sheets to scale or larger color plots to the HP1055CM Plotter in Room 321 on the 3rd level of MDOT in Augusta. This plotter was intended to be used to share the load of the HPCOLORRoom303. It should be used when sending for large color plots.

- If you need to map this printer as a Windows Printer for submitting from software other than MicroStation (i.e. Adobe, Excel, ESERI, Paint, E-Plans), click this link \\dot0dta1psprint and then double click the PLOTCHP2 plotter in the list.

US_HPCOLORRoom321Half

This option is for sending Half Size plan sheets to scale or other color plots to the HP1055CM Plotter in Room 321 on the 3rd level of MDOT in Augusta. This plotter was intended to be used to share the load of the HPCOLORRoom303. It should be used when sending for large color plots.

US_ pdf-8x11

This driver will create a black and white 8 1/2 x 11 pdf document provided you are running MicroStation version 8.05 or higher.

US_ pdf-8x11color

This driver will create a color 8 1/2 x 11 pdf document provided you are running MicroStation version 8.05 or higher.

US_pdf-color-fullsize

This driver will create a color, full size pdf document provided you are running MicroStation version 8.05 or higher.

Depending on the plotter you are sending to, consider sorting in ascending or decending order when using *Batch Print* to a multi-page PDF to receive the prints in the correct order.

US_ pdf-color-halfsize

This driver will create a color, half size pdf document provided you are running MicroStation version 8.05 or higher.

Depending on the plotter you are sending to, consider sorting in ascending or decending order when using *Batch Print* to a multi-page PDF to receive the prints in the correct order.

US_ pdf-fullsize

This driver will create a full size black and white pdf document provided you are running MicroStation version 8.05 or higher.

Depending on the plotter you are sending to, consider sorting in ascending or decending order when using *Batch Print* to a multi-page PDF to receive the prints in the correct order.

US_ pdf-halfsize

This driver will create a half size black and white pdf document provided you are running MicroStation version 8.05 or higher.

Depending on the plotter you are sending to, consider sorting in ascending or decending order when using *Batch Print* to a multi-page PDF to receive the prints in the correct order.

PRINTER_BW

Drivers with PRINTER in the name sends the plots to your default 8.5” x 11” printer that you have mapped to your computer. If you are sending prints to a color printer, this option will print Black and White. If you are using this option and sending to a Black and White Printer, all lines (even if you are displaying color) will print black.

PRINTER_COLOR

Drivers with PRINTER in the name sends the plots to your default 8.5” x 11” printer that you have mapped to your computer. If you are displaying color in your drawing, this option will print color. If you are using this option and sending prints to a Black and White Printer, lines other than black will be a gray tone.

PRINTER_STANDARD_DETAIL

Drivers with PRINTER in the name sends the plots to your default 8.5” x 11” printer that you have mapped to your computer. This option is intended but not limited to Standard Detail printing and will print Black and White. This option produces thicker weights than the PRINTER_BW. Compare the results of the two drivers and choose the one that suits your needs.

Hearing_PRINTER

Drivers with PRINTER in the name sends the plots to your default 8.5” x 11” printer that you have mapped to your computer. This driver is used by the Public Hearing Section, however can be used by anyone. Test and compare the results of this driver with other printer drivers and choose the one that suits your needs.

REGIONAL OFFICE PLOTTERS (HP750C AND OCE PLOTTER)

Overview

All of the Regional offices are equipped with an HP750C color plotter and an OCE Plotter in addition to any Laser Jet printers. These plot drivers are located in the !msInRoadsconf/standards/plotdrv/divisions/RegionName folder.

Use the printer and PDF drivers in the *plotdrv* folder for printing to a Laser Jet (8.5 x 11) printer or to PDF. Use the drivers in your specific "divisions" folder for all plots going to your HP750C or OCE plotter.

- Removing the "US_" from the front end of the drivers described will give you the names of the METRIC plot drivers.

US_FULL750C_???_GR

Default full-size black and white plot driver. Sends plots to the HP750C plotter.

- If you need to map this printer as a Windows Printer for submitting from software other than MicroStation (i.e. Adobe, Excel, ESERI, Paint, E-Plans), click one of the links below depending on the Region.

Region 1 click here→ \\Dot1dts1fsscr01 then double click the scr750c plotter in the list.

Region 2 click here→ \\Dot2dteaqpr001 then double click the HP750C plotter in the list.

Region 3 click here→ \\Dot3dtd4fsdix01 then double click the HP750C plotter in the list.

Region 4 click here→ \\Dot4dtb7fsbgr01 then double click the HP750C plotter in the list.

Region 5 click here→ \\Dot5dtp1fspqi01 then double click the HP750C plotter in the list.

US_HALF750C_???_GR

Default half-size black and white plot driver. Sends plots to the HP750C plotter.

US_Long_750C_???_GR

This option sends black and white plots longer than our normal plan sheet is tall (24"+/-). Currently, we have 4 different lengths available: 5ft, 10ft, 15ft, and 20ft. We use this in conjunction with clip boundaries of the same size to achieve a plot that is to a desired scale.

US_PLOTCHP_???

This option is for sending color plots to the HP750C plotter.

- There may be other drivers in your "divisions" folder that have been created by users. Some may work and others may not. If you need assistance with drivers contact CADD Support.

US_OCE9400FULL

This is a high speed, full size, black and white plotter that sends plots to the OCE plotter (if available) in your Regional Office.

The plots exit on the tray table that will stack plans based on the order they were printed resulting in reverse order. When *Batch Plotting*, click on the *Name* column to sort in decending order.

- If you need to map this printer as a Windows Printer for submitting from software other than MicroStation (i.e. Adobe, Excel, ESERI, Paint, E-Plans), click here→ \\Dot2dteaqpr001 then double click the Region 2 – Oce 9400 plotter in the list.

US_OCE9400HALF

This is a high speed, half size, black and white plotter that sends plots to the OCE plotter (if available) in your Regional Office.

The plots exit on the tray table that will stack plans based on the order they were printed resulting in reverse order. When *Batch Plotting*, click on the *Name* column to sort in decending order.

US_OCE9400LONG

This option sends black and white plots longer than our normal plan sheet is tall (24”+/-) to the OCE plotter (if available) in your Regional Office. Currently, we have 4 different lengths available: 5ft, 10ft, 15ft, and 20ft. We use this in conjunction with clip boundaries of the same size to achieve a plot that is to a desired scale.

US_OCETDS400FULL

This is a high speed, full size, black and white plotter that sends plots to the OCE plotter (if available) in your Regional Office.

- If you need to map this printer as a Windows Printer for submitting from software other than MicroStation (i.e. Adobe, Excel, ESERI, Paint, E-Plans), click one of the links below depending on the Region.

Region 1 click here→ \\Dot1dts1fsscr01 then double click the SCR OCE PLOTTER in the list.

Region 3 click here→ \\Dot3dtd4fsdix01 then double click the OceTDS450 plotter in the list.

Region 4 click here→ \\Dot4dtb7fsbgr01 then double click the OceTDS450 plotter in the list.

Region 5 click here→ \\Dot5dtp1fspqi01 then double click the PQI OCE Plotter in the list.

US_OCETDS400HALF

This is a high speed, half size, black and white plotter that sends plots to the OCE plotter (if available) in your Regional Office.

US_OCETDS400LONG

This option sends black and white plots longer than our normal plan sheet is tall (24”+/-) to the OCE plotter (if available) in your Regional Office. Currently, we have 4 different lengths available: 5ft, 10ft, 15ft, and 20ft. We use this in conjunction with clip boundaries of the same size to achieve a plot that is to a desired scale.

PEN TABLES

Overview

Pen tables are used in combination with certain Plot Drivers, to accomplish a desired output to a printer or plotter. Each pen table does something different to your drawing at plot time. Some will require testing with your type of drawing, others have been established for specific types of drawings.

!pentable.tbl

This is the default pen table for plan production. This is used for all plans being submitted to Contracts with the exception for Title sheets for Highway users.

We have combined four old pen tables into this default pen table. It substitutes certain text items (username, division, date, file name, etc.) into standard MDOT borders.

This pen table lets you print out survey elements in a gray tone. Elements are changed to gray if they are in a reference file that has one of the following logical names:

Topo, Text, Points, Contours, Topoadd1, Topoadd2, and Topoadd3.

Gray elements, like Cross Section and Profile grids, are prioritized to plot underneath all black elements. Elements in these files that are weight 0 are changed to weight 1.

Amendment.tbl

This pentable will be used when sending electronic Amendment drawings to the one of the color plotters. All existing elements will be grayed, proposed will be black and Amendments will be green.

As-Built.tbl

This pentable will be used when sending electronic As-Built drawings to the one of the color plotters. All existing elements will be grayed, proposed will be black and As-Built elements will be red. Any Amendments will appear green.

BORINGLOG.tbl

This is used by Geotech to produce desired plots of their Boring Log sheets.

ENV_PRINTER_COLOR

This is used by Environment to produce the desired plots for 8 1/2” x 11” color Wetland Mitigation plans.

Graysurvey_wetlands.tbl

This is used by Environment to produce plans of Wetland delineation. This makes the Wetland **bold** so that they stand out on the plots.

Heavytopo.tbl

This plots out the existing survey in black as opposed to graying it out as does the !pentable.

MHPC.tbl

This is used by Environment to produce a color plan set for plans to be submitted to MHPC. Use this pentable when sending for plots that utilize Level Symbology Overrides.

MHPCplan-No Symbology

This is used by Environment to produce a color plan set for plans to be submitted to MHPC. This pentable doesn't use Level Symbology Overrides.

Prelim_plan_color.tbl

This is used by the Bridge Program to produce a colored preliminary plan.

Title.tbl

This is used by the Highway Program when printing a Title Sheets that has a Plan Layout. This adjusts dashed lines in the topo drawings so that they can still be displayed at the smaller scale.

Hearing_Thicker.tbl

These were set up for our Hearing Section in order to increase the weights of lines, by one stroke, at plot time.

Hearing_Thinner.tbl

These were set up for our Hearing Section in order to decrease the weights of lines, by one stroke, at plot time.

PublicHearing.tbl

These were set up for our Public Hearing Section to speed up the coloring process of metric projects.

usPublicHearing.tbl

These were set up for our Public Hearing Section to speed up the coloring process of U. S. Customary projects.

Laserjetblack.tbl

This option will force every color in your drawing to black. This was intended to be used with a Laser printer.

Rowblack.tbl

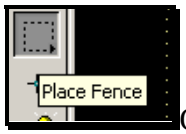
This option adjusts the processing order and forces all color to black except for color 46.

SINGLE SHEET PLOTTING (FENCE PLOTTING)

Overview

This procedure is for sending a single Plan Sheet to a plotter or printer at a desired scale using a fence. It requires that you are using a standard border drawing that has predefined boundary strings. There are two boundaries for Metric projects, one for an OCE plotter and one for HP1055CM or HP750C plotters. In our U.S. Customary projects the borders only have one string that will work for all plotters. All printers (8.5 x 11) use the same boundary string.

Step One: Place a fence



Click on the Place Fence icon and set the *Fence Type* to **Element** and the *Fence Mode* to **Inside** (Figure 1-24).

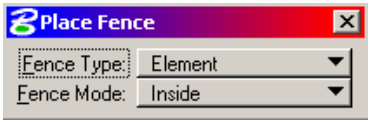


Figure 1-24: Place Fence Options

Click on the boundary string. U.S. Customary borders only have one boundary. For Metric projects, click on the boundary string that is used for the plotter you are plotting to. Zoom in on the top left had porting of your border to determine which shape is right for you (Figure 1-25). (Outer dotted boundary is used for the OCE plotters; the inner solid boundary is used for HP plotters.)

Figure 1-25: Metric border with two boundary strings

Step Two: Select Print/Plot

From the main menu select **File > Print** option.

On the **Print** dialog, press the **Magnifying Glass** button or go to the menu and select **File>Bentley Driver…** (Figure 1-26**)**.

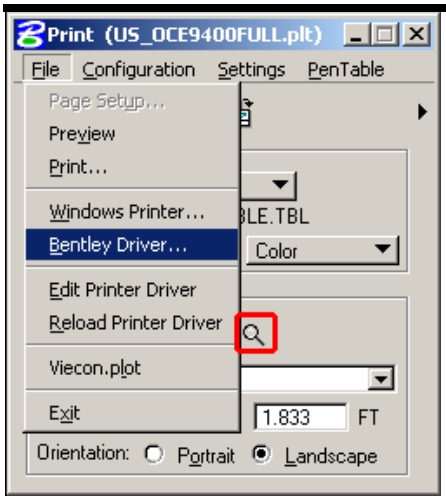


Figure 1-26: Plotter Driver on the Print Dialog

You should see a list of plot driver files pop up for you to select from. If you do not see the standard plot drivers, please browse to **C:\!msInRoadsconf\standards\plotdrv.** Select the plot driver that you want to plot to.

✓ *For a complete list of drivers, refer to page1-32.*

Step Three: Select Pentable (If Necessary)

Select the pen table if necessary. The default table (!pentable) should be loaded, however if you want a different one, select **Pentable>Attach** from the menu and select the desired pen table. If you do not see the standard pen tables, please browse to **C:\ !msInRoadsconf\standards\tables\pen**.

✓ *Refer to page1-40 for a complete list of Pen Tables.*

Step Four: Modify Attributes (Optional)

You now have the ability to modify attributes through the **Print Dialog**. In the past you would have to select **Settings>View Attributes** from MicroStation to turn off Construction Elements on single sheet printing. Now you can select **Settings>Print Attributes…** from the **Print Dialog** menu and toggle things on and off without effecting the display in your main view.

Step Five: Preview Print (Optional)

From your **Print Dialog**, you can preview your plot by either selecting from the menu **File>Preview,** clicking on the **Preview** icon (Figure 1-27) next to the **Print** icon, or you can simply expand the dialog by clicking the **Show Preview** to the right top of the dialog (Figure 1-27).

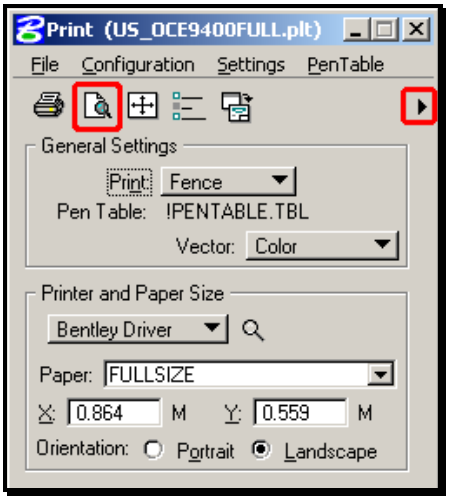


Figure 1-27: Preview Icon

Step Six: Show More Details

You can also get more information by selecting the **Show Details** expansion button in the lower right hand corner of the **Print Dialog** (Figure 1-28).

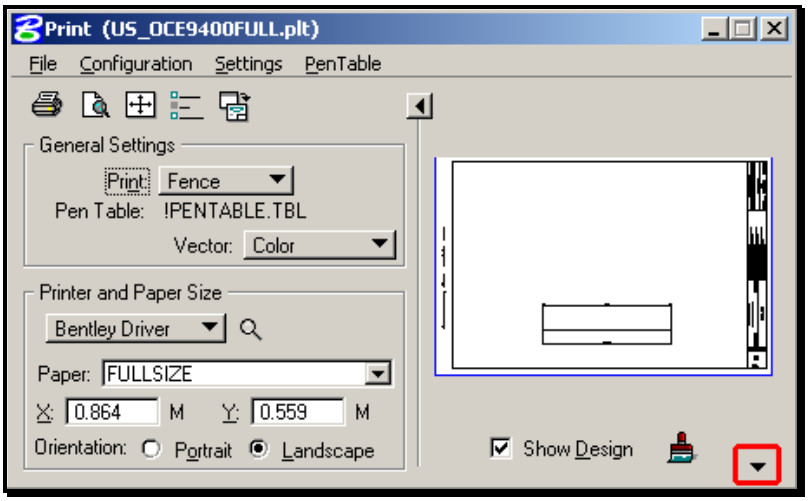


Figure 1-28: Show Details

Step Seven: Check Scale

When you expand the dialog you will see information about your **Print Size/Scale** and **Print Position** (Figure 1-29). You may notice that the **Scale:** shown in this image (3.2808' to 1 M) looks incorrect. It really isn't, this is the conversion factor of U.S. Customary to Metric. If you would like to see the correct scale you can change the settings to read feet to feet. This is done by selecting **Settings>Units>FT** from the **Print Dialog** menu. Now the scale should make more sense (Figure 1-30).

ⓘ ***If the scale seems to be out of whack when switching the units then you may need to reopen the file or close out of MicroStation and come back in to see the correct factor.***

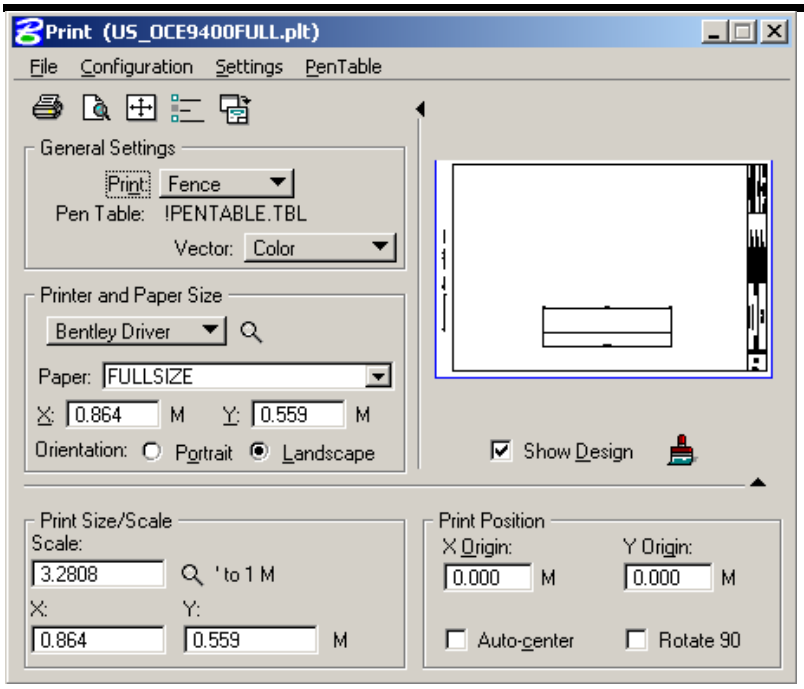


Figure 1-29: Print Size/Scale & Print Position

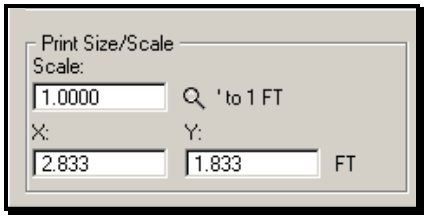


Figure 1-30: Print Size/Scale

The **Print Position** settings displayed in the prior caption are fine as displayed.

- When doing a fence plot and picking your plot driver you should not have to worry too much about the settings for **Print Size/Scale** or **Print Position**.

Step Eight: Print

If everything looks fine then hit your **Print** icon or **File > Print…** and send your print.

PLOTTING SHEET FILES (BATCH PRINTING)

Overview

This procedural manual will lead you through some routines involved in plotting sheet files (files named in the form of “001_HDPlan1.dgn” that contain standard borders.)

Step One: Making a Batch Print Job

The *Batch Print* utility **(File > Batch Print/Plot(DOT))** is MicroStation’s “one-stop shopping” for plotting. It’s going to make sure our plots are made to the right scale, to the right plotter, and with the right elements showing or not showing. It will also allow us to plot out files one by one, in specific groups, or all at once. Naturally, this takes a little bit of setup...

First, select **File > Batch Print/Plot (DOT)**. This brings up the *Batch Print* dialog (Figure 1-31).

- Selecting the DOT option will open a dialog to your PIN directory, giving you the option to select a previously saved *.job* file. Hit *Cancel* if you would like to setup your own at this time.
- The caption below is for U.S. Customary units, based off the working units of your project MicroStation will launch a different *Batch Print* dialog with changes to the **Specifications Controlling Printing** area.

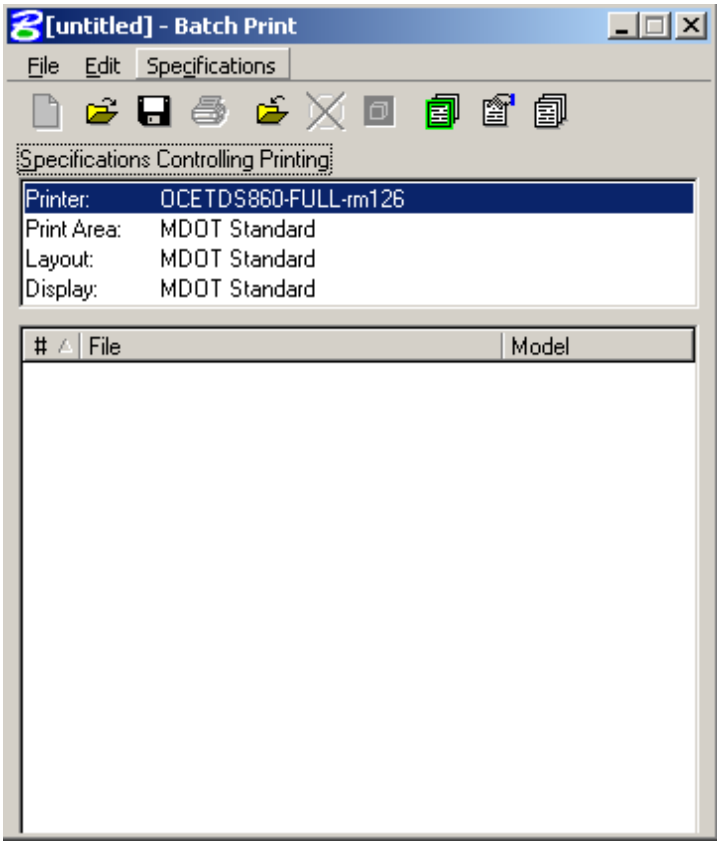


Figure 1-31: Batch Print dialog

This dialog allows you to create a *Batch Print* "Job." A Job has two parts: a list of files and a list of specifications. The files are simply the .dgn files that *Batch Print* is going to plot for you, and they'll be listed at the bottom of the dialog under the *Design Files to Print* area.

The Specifications control *how* these files are going to be plotted, the extents to be plotted, which printer they'll be sent to, which elements will be dithered, etc. There are four specific specifications: Printer, Print Area, Layout, and Display.

Next, select the files you want to include in your *Batchplot*.

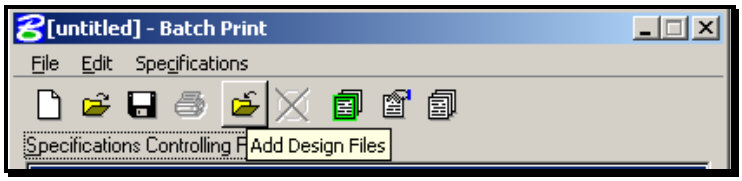


Figure 1-32: Add Design Files

Step Two: Add Design Files

Push the **Add Design Files** button (Figure 1-32) on the *Batchplot* dialog.

This brings up the **Select Design Files to Add** dialog (Figure 1-33).

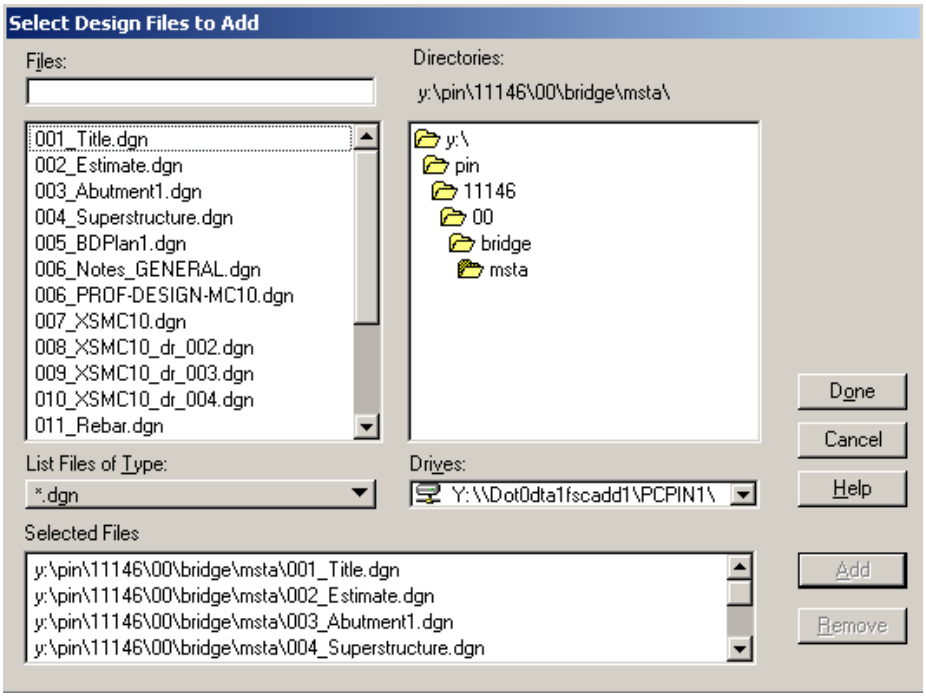


Figure 1-33: Select Design Files to Add

Select all of your sheet files from the file list at the left. When they are highlighted, press the **Add** button at the bottom of the dialog. Don't just select the files that you want to print right now. Pick all the sheet files in the job. *Batch Print* will allow you to print them out one at a time if you want. Notice the file names are now displayed in the **Selected Files** list. When you have added all the files, push "**Done**".

- MicroStation V8.5 and higher allows the user to sort their files in asending or decending order based on their file name. Click the *Name* column (acts like a toggle) to sort in either direction. Depending on the plotter you are sending it to will determine how you want to sort them.

Step Three: Set Specifications

Part One: Set Printer

From the **Specifications Controlling Plotting** area, select the **Printer** line. The Printer specification chooses a plot output location and a sheet size. Push the **Select Specification** button to see the options (Figure 1-34).

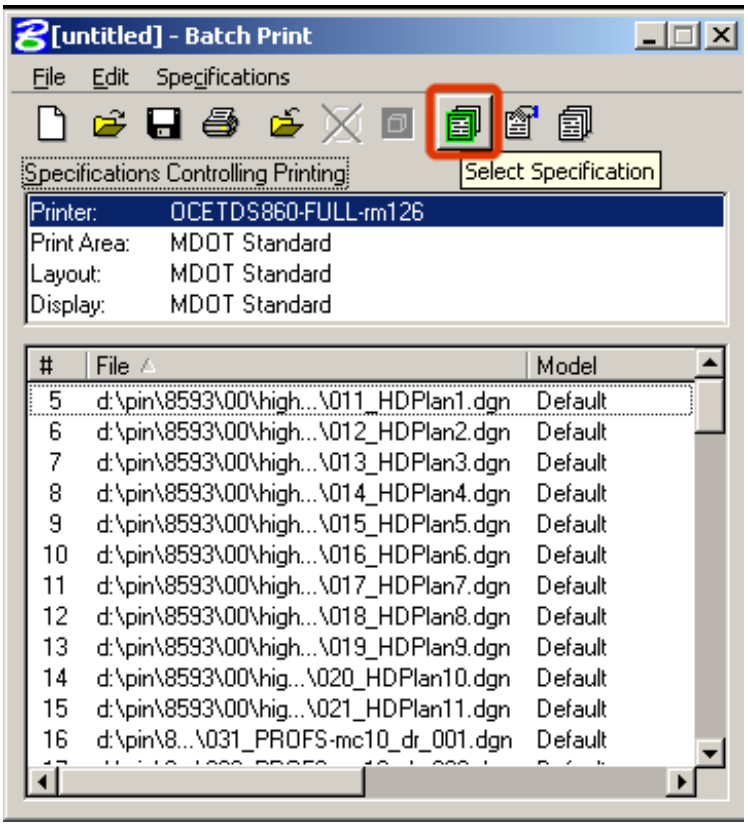


Figure 1-34: Batch Print Dialog

Notice that there are many selections here (Figure 1-35). The capture only shows seven, however, there are many to choose from as outlined previously. Select the plotter you wish to plot to.

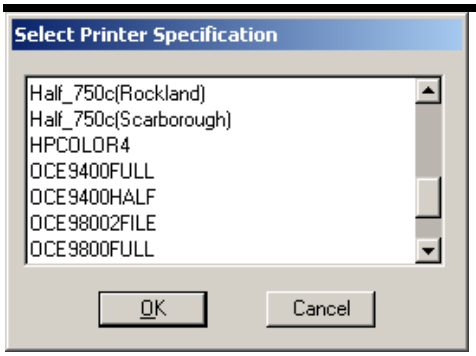


Figure 1-35: Select Printer Specification

Depending on the printer and sheet size you want, select the printer (i.e. OCETDS860-full-rm126) from the **Select Printer Specification** dialog and click **OK**.

Part Two: Set Print Area

The **Print Area** options determine what element you are looking for in a design file to print to. When plotting to a printer (81/2 x 11) select *printer, printer_color or Standard Details.* All other plan sheets should be plotted to the *MDOT Standard* option.

- If this was a Metric project then you would leave the **Print Area** option set to *OCE* for the OCE plotters in Augusta and for Regional users it would be set to *divisions* for their HP plotters or OCE if they have one.

Part Three: Set Layout (not necessary)

The **Layout** specification does not need to be touched.

Part Four: Set Display

The **Display** specification controls which elements are plotted (for example, it can be used to turn off the display of all construction elements prior to plotting.) It is also responsible for attaching *Pen Tables* to the plot. We are using *Pen Tables* for a couple of purposes, including automatic sheet numbering and dithering survey information.

Select the **Display** selection in the *Specifications Controlling Printing* dialog and push the **Select Specifications** button (Figure 1-34).

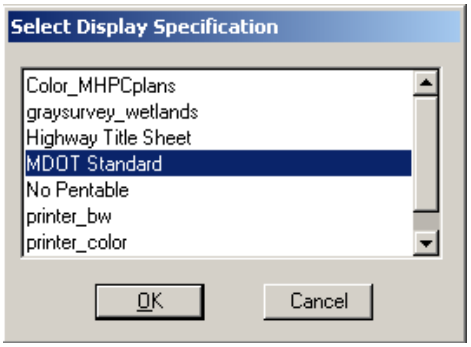


Figure 1-36: Select Display Specification

The default option is “oce” for Metric projects and “MDOT Standard” for U.S. Customary projects (Figure 1-36). This utilizes the *!pentable* and will make sure that sheet

numbering happens correctly, survey files dither in our plot, and that grid lines are plotted underneath the proposed design. For explanation of additional pen tables, refer to their breakdown previously outlined in this Chapter.

Part Five: Save Job File

Now that we have our file list and specifications set, it's time to save this *Batch Print Job*. On the **Batch Print** dialog, select **File > Save**. This brings up the **Save Job Set File** dialog (Figure 1-37).

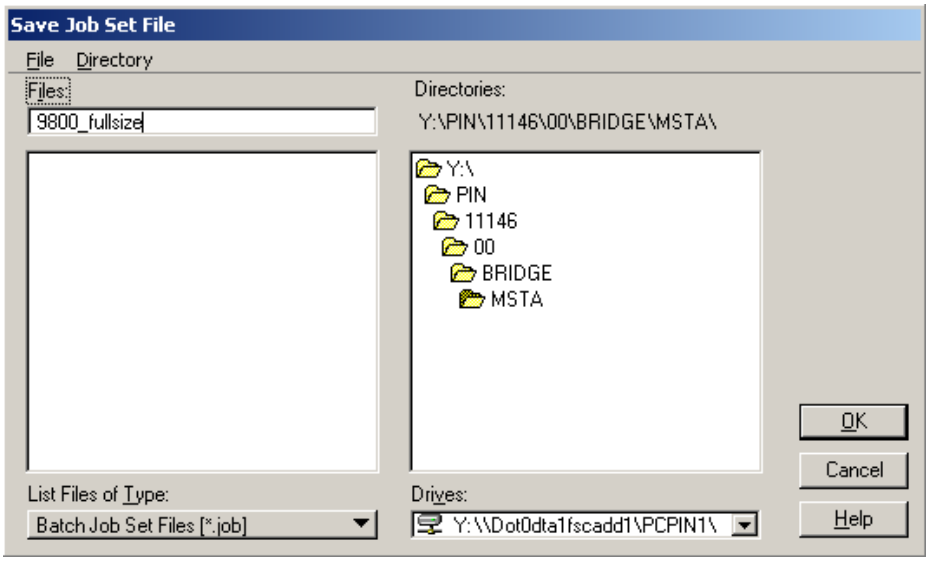


Figure 1-37: Save Job Set File Dialog

To make it easier to use this .job for the duration of the project type in a name that reflects both the sheet size and the plot location. For convenience, keep the .job file in your workgroups **\msta** directory of your project folder (this should be the default option.) When you've named the .job file, press **OK**. You have now successfully created a *Batch Print Job*.

Step Four: Printing with Batch Print

- MicroStation V8.5 and higher allows the user to sort their files in asending or decending order based on their file name. Click the *Name* column (acts like a toggle) to sort in either direction. Depending on the plotter you are sending it to will determine how you want to sort them.

✓ *Refer to the plotter listing to determine whether or not the plots will come out in asending or decending order.*

Now you can select one or more sheets to be plotted (using Ctrl key to pick and choose or Shift key to select a range). If you want to print all files, push print without selecting any files.

Click the *Print* icon or select **File>Print…**

The *Print Batch* dialog will open (Figure 1-38). If you made a selection, you will be prompted as such or if you did nothing, the all button will be defaulted. If you meant to select all, you can pick it now. After you make a selection, press **OK**.

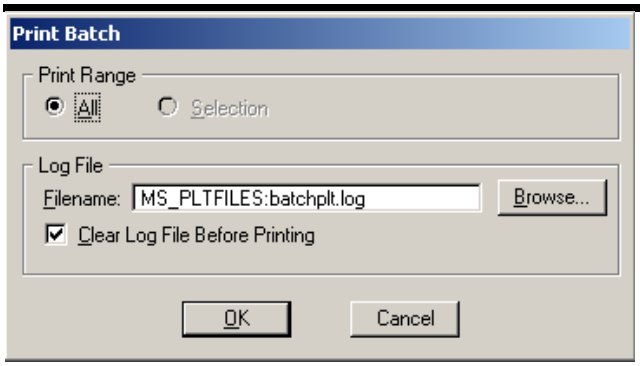


Figure 1-38: Print Batch Dialog

As the plots are being sent to the plotter, the progress will be displayed in another dialog. Wait until this is complete before trying to do anything else in your drawing.

Batch Print Troubleshooting

Batch Print also generates a **Log File** for troubleshooting purposes called *batchplt.log*. This file gets written to the same directory you are plotting from. Open Windows Explorer and browse to this location (i.e. Y:\pin\11146\00\Bridge\MSTA\). Open this file and look for an error statement or for the last file that was actually plotted.

Some common problems are, the file does not contain the *clip boundaries* necessary to define the plot area, or a small filled shape exists on one of your drawings. An example of a small filled shape could be a radius of a side road that is shaded on a Title Sheet. In this case, select the whole drawing and scale it up 100 times. Now the shape should be able to be plotted. If this doesn't work, consider hatching this area with close line spacing.

PRINTING FROM AN EXISTING BATCH PRINT JOB

Once a *Batch Print Job* has been created for a project, printing is much more streamlined.

To print a file (or a group of files) that is part of a *Batch Print Job*, first open the **Batch Print** dialog from **File > Batch Print/Plot (DOT)**. This option will also automatically browse to your active PIN folder.

Choose the existing .job file (Figure 1-39) you want to print from and press **OK**.

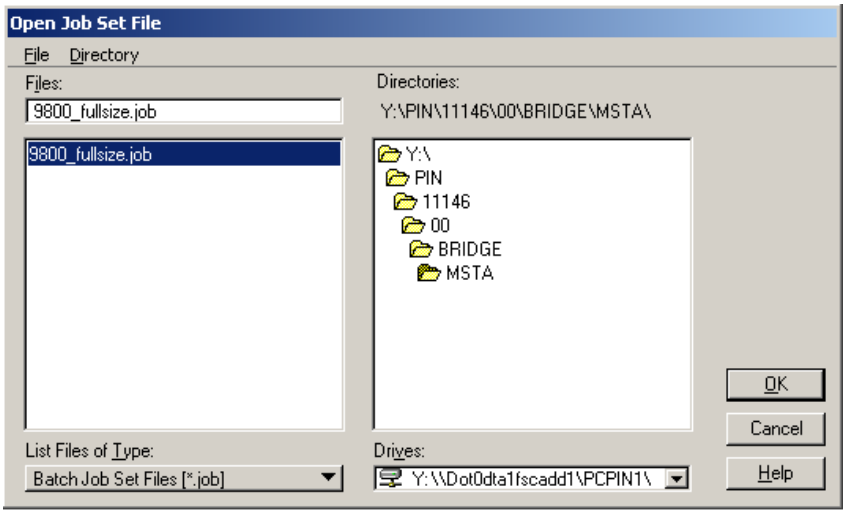


Figure 1-39: Open Job Set Dialog

On the **Batch Print** dialog, select the file or files you want to plot (Figure 1-40).

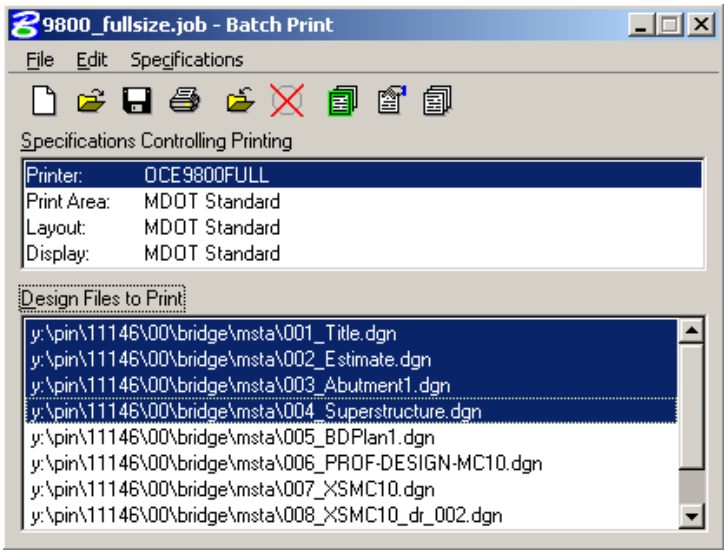


Figure 1-40: Pick Files to Batchplot

If you want to print all files, push print without selecting any files.

From the **Print** dialog, you have the option of printing **All** files, or just the **Selection** of files you made in the previous step (Figure 1-41).

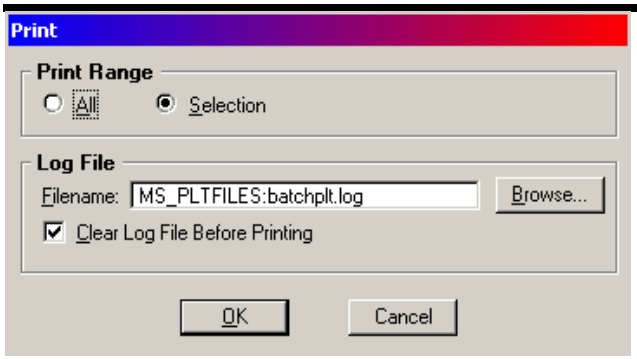


Figure 1-41: Batchplot Selection

Once you make a selection, push the **OK** button. As the plots are being sent to the plotter, the progress will be displayed in another dialog. Wait until this is complete before trying to do anything else in your drawing.

CREATING LONG PLOTS

Step One

Make sure you have the **Plan** *Settings Manager* by choosing **Settings > DOTSetMgrs > Plan Sheet Settings**. This should be autoloaded for you.

Right Click anywhere on the *Settings Manager* and choose **Category > Scale** and pick the scale you want to plot to (i.e. 1 in.=25 ft. or 1 in.=50 ft.). From the **USPlan** *Settings Manager* choose **Long Plots > [5 foot/ 10 foot/ 15 foot/ 20 foot/Plan Sheet HP Plotter/Plan Sheet OCE Plotter]**

ⓘ ***It is important that you remember which border size you used in order to set your paper size when you print.***

Step Two: Placing the Cell

You should see the plot boundary on your cursor. You will place it with two clicks. The first places the origin of the cell. The second allows you to spin the cell around the origin point (Figure 1-42).

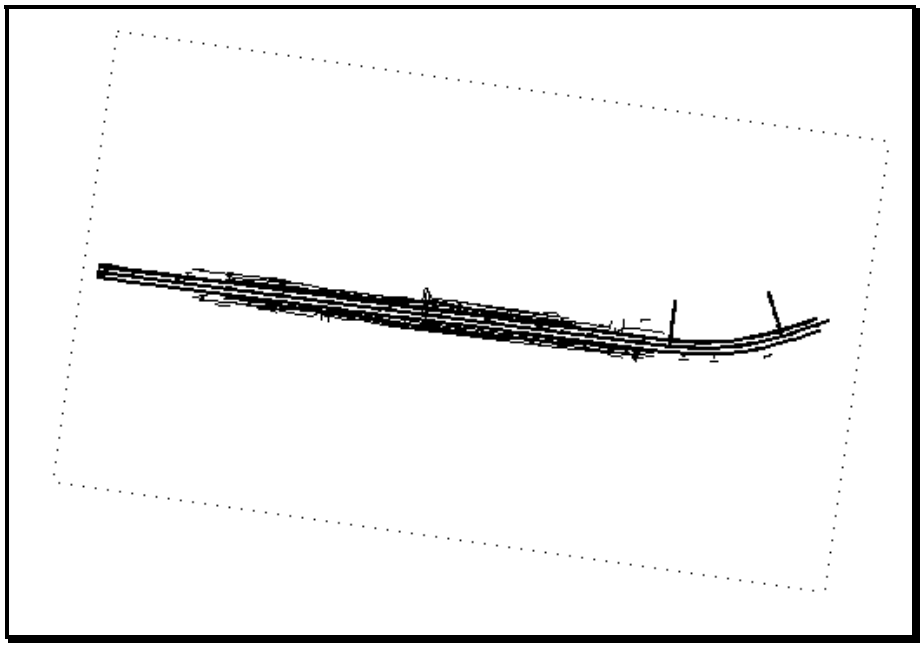


Figure 1-42: Long Plot Boundary

Step Three: Rotate View

Before we can print, we have to rotate our view. Select the **Rotate View** button in the lower left hand corner of window 1 (Figure 1-43).

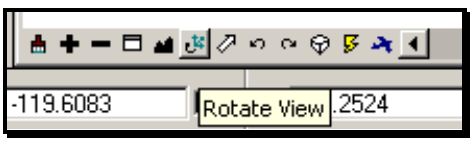


Figure 1-43: Rotate View Button

Select the **3 Points** method from the *Tool Settings Window* (Figure 1-44).

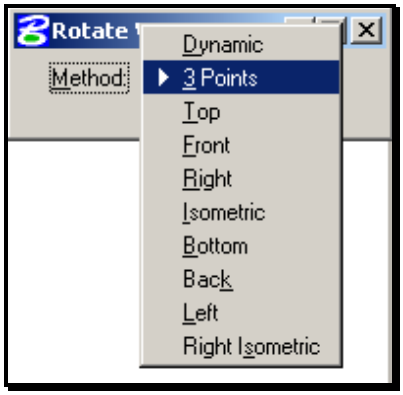


Figure 1-44: 3 Points Method

The “three points” specify the x origin, positive x direction and positive y direction of your view. Choose your first two points by snapping to the two corners of the boundary.

- Always define the two points in a left to right motion.

Your third point defines the positive y direction. Snap to an area of the screen that would be above the left to right selection of the two previous points.

ⓘ ***Picking these points in the wrong order can result in flipping your design upside down. Correct this by Rotating the view again, setting your Method to Top*** **(Figure 1-42).**

It is recommended to rotate your view horizontally as shown in (Figure 1-45).

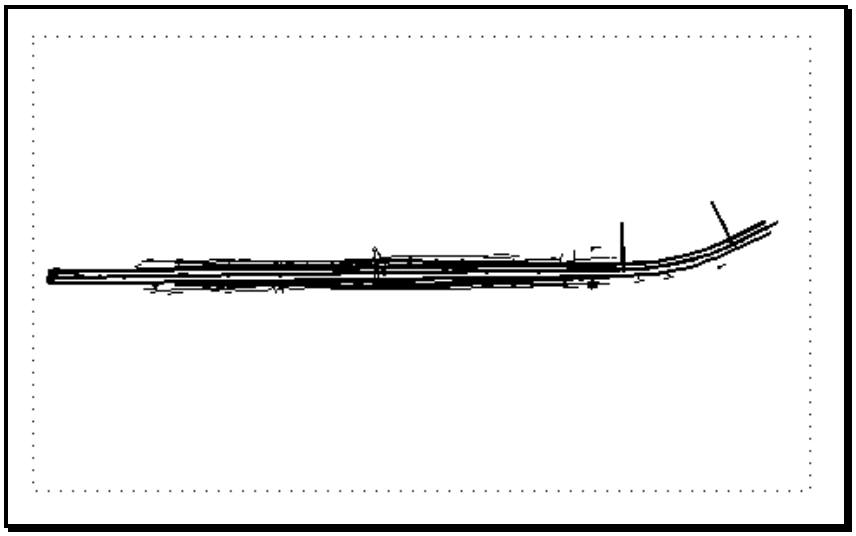


Figure 1-45: Vertical Long Plot View

Step Four: Printing

Place a fence on the boundary you just rotated.

From the main menu select the **File > Print** option.

In the **Print** dialog select **File> Bentley Driver…** or the **Magnifying** button (Figure 1-46).

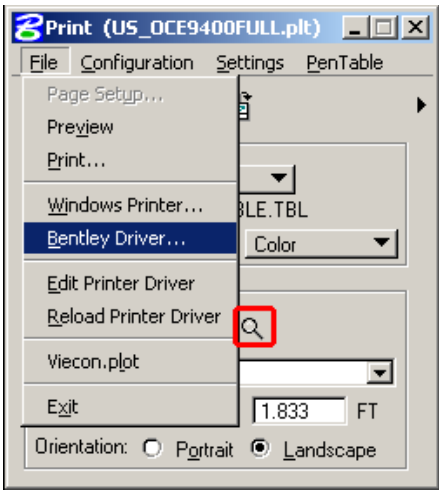


Figure 1-46: Plot Driver on the Print Dialog

You should see a list of plot driver's display for you. Select a driver that matches the type of plot you are sending. Use a driver with "**LONG**" in the name for **5, 10, 15** or **20** foot long plots, or use a driver with "**FULL or HALF**" in the name for "Plan Sheet" size clips.

The possible plot boundary shapes allow for a maximum plot size of 20 feet. There is no reason to change your **Paper:** size in the **Printer and Paper Size** area of the dialog (Figure 1-47). Leave it set to the defaulted **20FTPLOT** for any size.

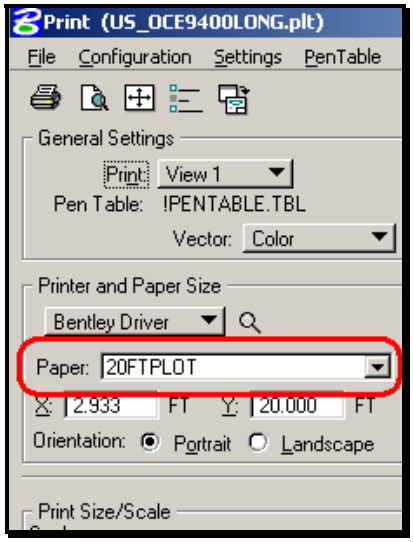


Figure 1-47: Page Setup on the Plot Dialog

- Based on the rotation you used in your view, it may be necessary to toggle the **Rotate 90** on or off to plot correctly (Figure 1-48).

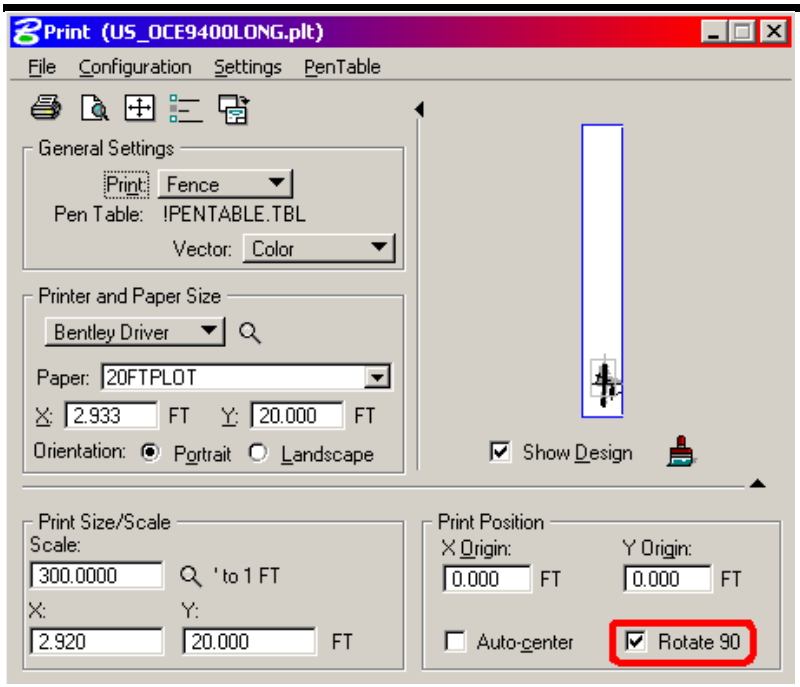


Figure 1-48: Print Rotate 90

ⓘ ***The processing time for long plots will be a little longer than a normal plot but we still need to be prompt in retrieving our plots so that they don't jam the plotter and also doesn't end up all over the floor.***

FENCE PLOTTING TO SCALE

It is easy to create a scaled print by placing a fence in the area you want. In the following example we are going to print an area to 1 in. = 25 ft.

Step One: Place Fence

Place a fence around the area you would like to print (Figure 1-49).

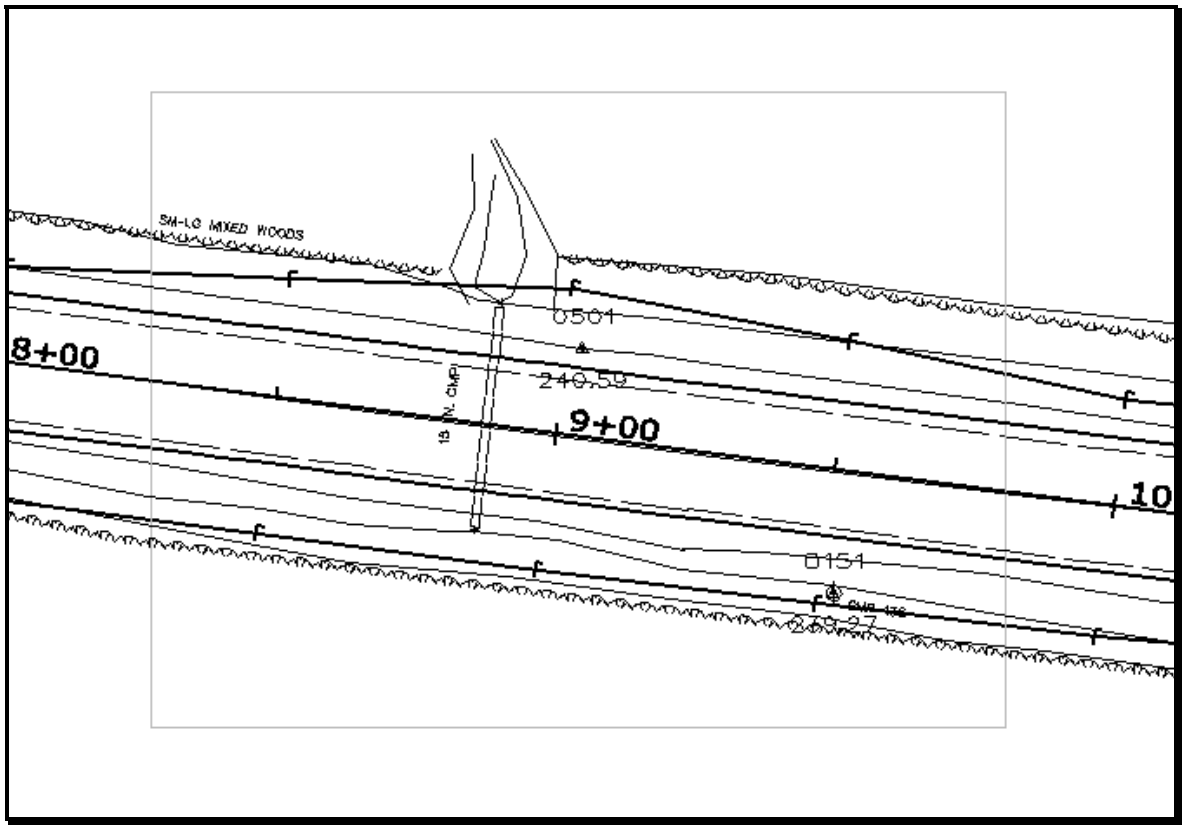


Figure 1-49: Place Fence

Step Two: Setting Scale

Select **File>Print** from the *Main Menu*. Expand the **Print** dialog so you can see the **Print Size/Scale** area, in the lower left hand corner of the dialog. In (Figure 1-50) we have our **Scale:** options set to "**':" to 1 FT**", this means we need to apply an absolute scale of "**300" (12 in. x 25 = 300)** to get a 25 scale plot (Figure 1-51). You could change this option to "**':" to 1 IN.**" by selecting **Settings>Units>IN** from the **Print** menu. This would allow you to set the **Scale:** to "**25**" (Figure 1-52).

- You are only allowed to change the scale option to a larger number than what is displayed when opening the *Print Dialog.* If you can not get the desired scaled print you want then consider either making the fence smaller or changing paper size.

If you have set your desired scale then select either the **Print** icon or **File>Print…** from the menu.

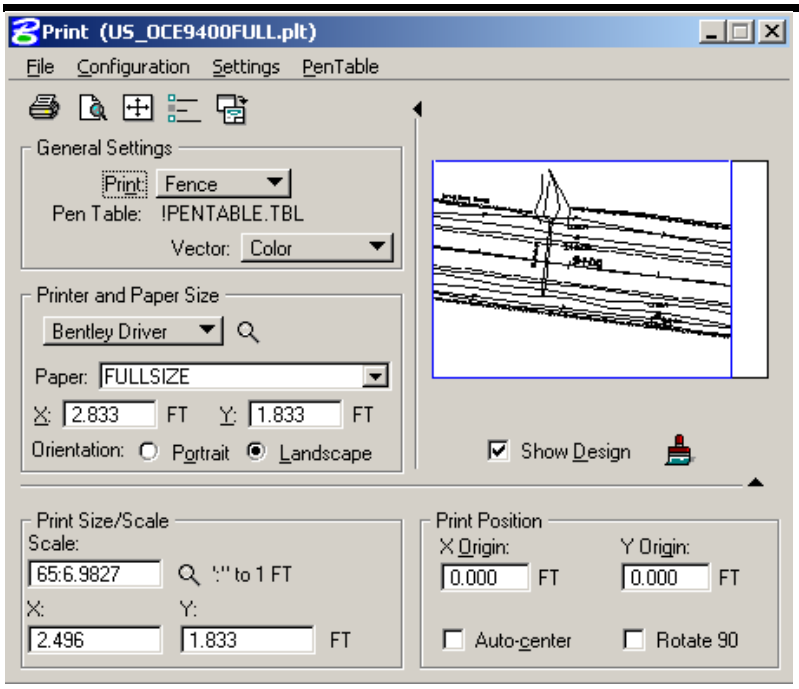


Figure 1-50: Scaled Printing by Fence

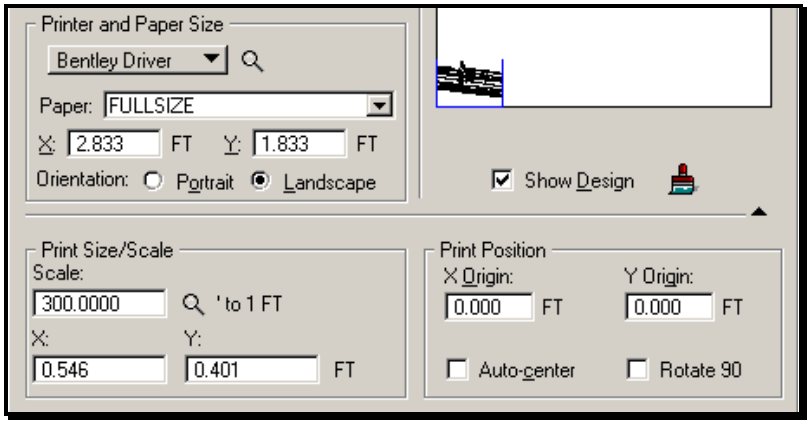


Figure 1-51: Scale Change Master Units

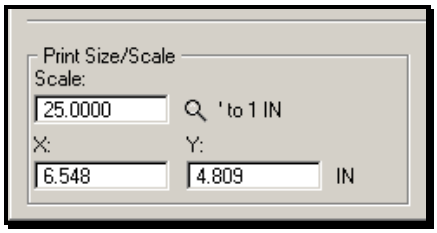


Figure 1-52: Scale Change Sub Units

COLOR PLOTTING

Using a combination of file referencing techniques it's possible to make plans that will print out in full color. It requires that you put all of your color-filled areas in a single file, then reference that file to your border along with your line drawings. Use a color plotter (i.e. **US_HPCOLORRoom303.plt**) plot driver to make your final printout.

File Setup

Start by making a new file to put your coloring in. It's probably quickest to start by opening the file you want to color, then from the menu, select **File > Save As** or by selecting **File>Make Sheetz**. Name your file beginning with a "c_" prefix to point out that the file is color.

PLOTTING TO PDF

Create MicroStation PDFs

- A .pdf file is only a "snapshot" of the file at its present state. Any changes made to the MicroStation file will not be represented in the .pdf without recreating it. Without the PDF writer software, you can't add and remove .pdf sheets as they change, you would have to re-create the whole multi-page .pdf or send them as single sheets.

Option One: Creating a single PDF

Creating a .pdf is as easy as printing to a plotter. A single file can be created as a .pdf by placing a fence around the drawings plot boundary and picking the plot driver **pdf-fullsize** (select the US version for US Customary project) from the plotdrv folder. The file will be created in your active MSTA directory. *Print Exec Workgroup* can use the .pdf to print full size or scale the .pdf to halfsize if that's your desired hardcopy size. It is recommended that a user create a separate folder for the single .pdfs and replace older ones as changes to the drawings are made.

Option Two: Batch Printing to a Multi-page PDF

When Batch Printing, select the **pdf-fullsize** printer from available printers. Add the files you want to print, select **pdf_bw-Fullsize** from the available printers and select print. When the *Print Batch* dialog opens (Figure 1-53), add a **file name** and **.pdf** extension (i.e. FinalPlans.pdf) in the *filename* portion of the dialog. Do not remove the MS_DEF: variable.

Depending on the plotter you are sending to, and it's output orientation, consider sorting in ascending or decending order when using *Batch Print* to a multi-page PDF to receive the prints in the correct order.

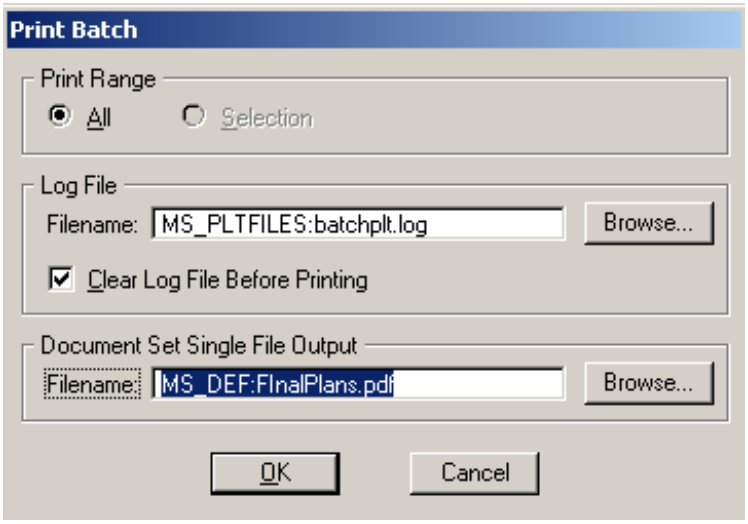


Figure 1-53 Print Batch dialog. Add the filename with the .pdf extension.

The file will be created in your active MSTA folder. *Print Exec Workgroup* can use the .pdf to print full size or scale the .plt to halfsize if that's your desired hardcopy size.

Printing PDF

A user can print a PDF document as Full Size or Half Size, in reverse order and request multiple copies. When there are vertical sheet internally to the PDF, these sheets will need to be rotated 180 degrees in the hard copy plan set. To bypass this issue, the sheets can be rotated electronically to appear as landscape sheets along with the rest of the internal pages. This can only be done by someone with PDF Writer software. Either the Reproduction staff or someone with this Adobe Professional software can finalize the PDF for printing or simply rotate the stack of sections manually.

Rotate Vertical Pages with Adobe Professional (Optional)

Vertical Cross Section pages need to be rotated 90 degrees counter-clockwise so that they are printed correctly with the binding edges matching all the other pages in the plan set.

Select the *Pages* tab and locate the vertical pages (if any exist). Select the first sheet that requires rotating. While holding the *Shift* key, scroll to the last vertical page. Release the *Shift* key. Right-click on the selected pages and select **Rotate Pages…** (Figure 1-54).

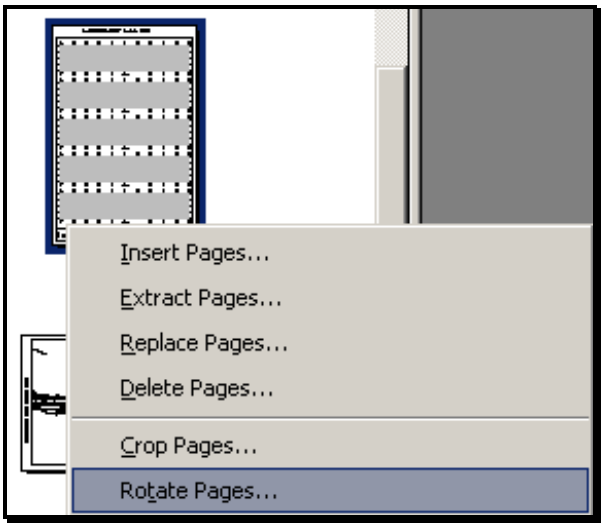


Figure 1-54: Right-click and select Rotate Pages

In the *Rotate Pages* dialog (Figure 1-55), adjust the *Direction* to **Counterclickwise 90 degrees.** Verify that the *Page Range* is set to **Selection.** Click **OK.**

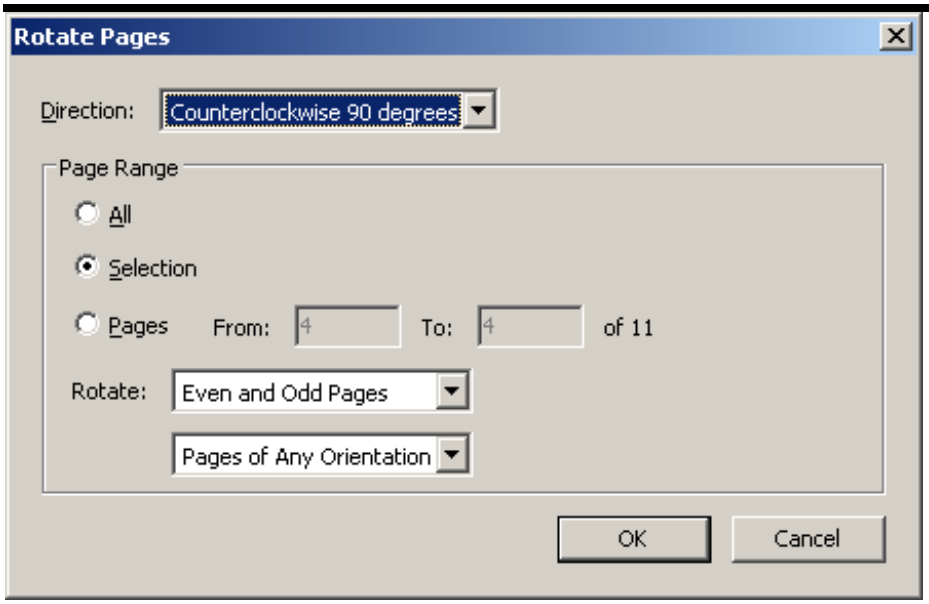


Figure 1-55: Rotate Pages dialog

Save the PDF Document

Select **File>Save** from the main menu.

Print to OCETDS600 or OCETDS800

Adding a Printer

Printing the PDF will require that the OCETDS600 or OCETDS800 has been added as one of your available printers. If it isn't, open *Windows Explorer* and browse to the \\Dot0dta1psprt02\ folder (or click the underlined link in the electronic document). Double click the **OceTDS600-Rm312** or **OceTDS800-Rm126** printer in the list (Figure 1-56).

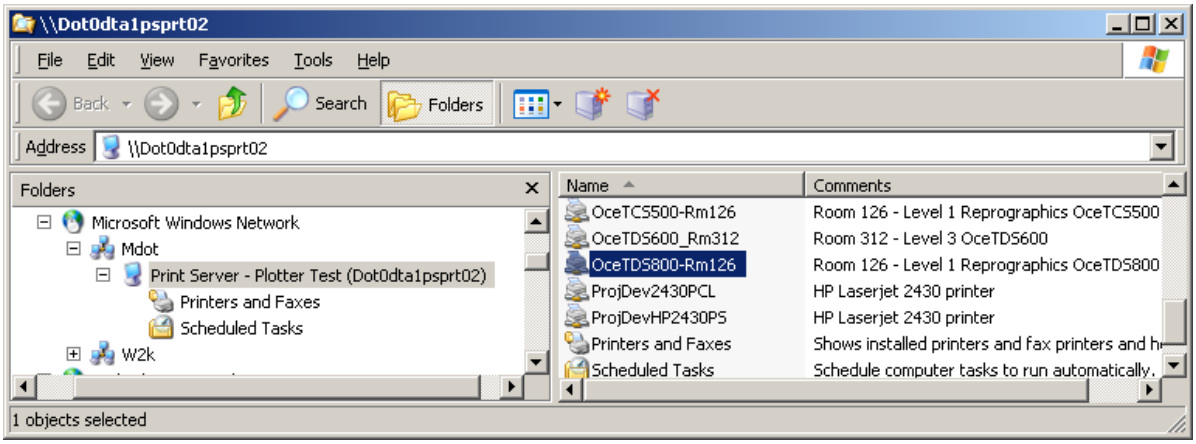


Figure 1-56: Double click the OceTDS800-Rm126 to add the printer

Printing the PDF Document

Open the PDF document. Select **File>Print.** Select the printer from the *Printer Name* pull down. Set the *Print Range* to **All.** Place a check mark in the **Reverse pages** box. In the *Page Handling* portion of the dialog, set the number of copies desired (if more than one, place

a check mark in the collate box), set the *Page Scaling* to **None**, place a check mark in the *Auto-Rotate and Center* box and place a check mark in the *Choose Paper Source by PDF page size* box (Figure 1-57).

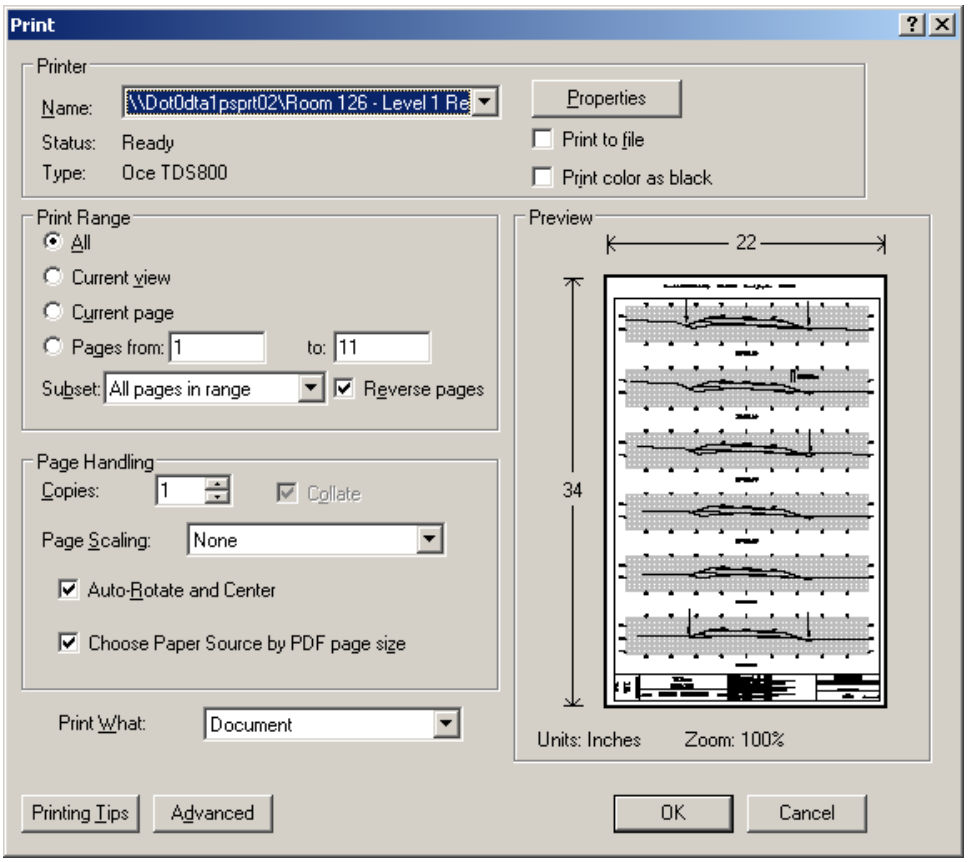


Figure 1-57: Print dialog with adjustment made for a Full Size US Customary project

Select *Properties*. Depending on whether you want a Full Size or Half size plot or whether it's a metric or U.S. Customary project, will depend on the settings you choose. Select the **Refresh** button on the *Basic* tab to refresh the list of page sizes available and make the adjustments necessary.

- **Full Size U.S. Customary Project –** Set the page size to **Oce D 22x34 in.**
- **Full Size Metric Project –** Set the page size to **Oce D+ 24x36 in.**
- **Half Size U.S. Customary Project –** Set the page size to **Oce B 11x17 in.**
- **Half Size Metric Project -** Set the page size to **Oce B+ 12x18 in.**

In addition to these setting, the OCETDS600 (only) will need one more adjustment for half size plots. Select the *Layout* tab (Figure 1-58). In the *Custom Scale* portion of the dialog, place a check mark in the *Keep Aspect Ratio* box. Adjust the *Custom Scale* to **50%.** Click **OK.**

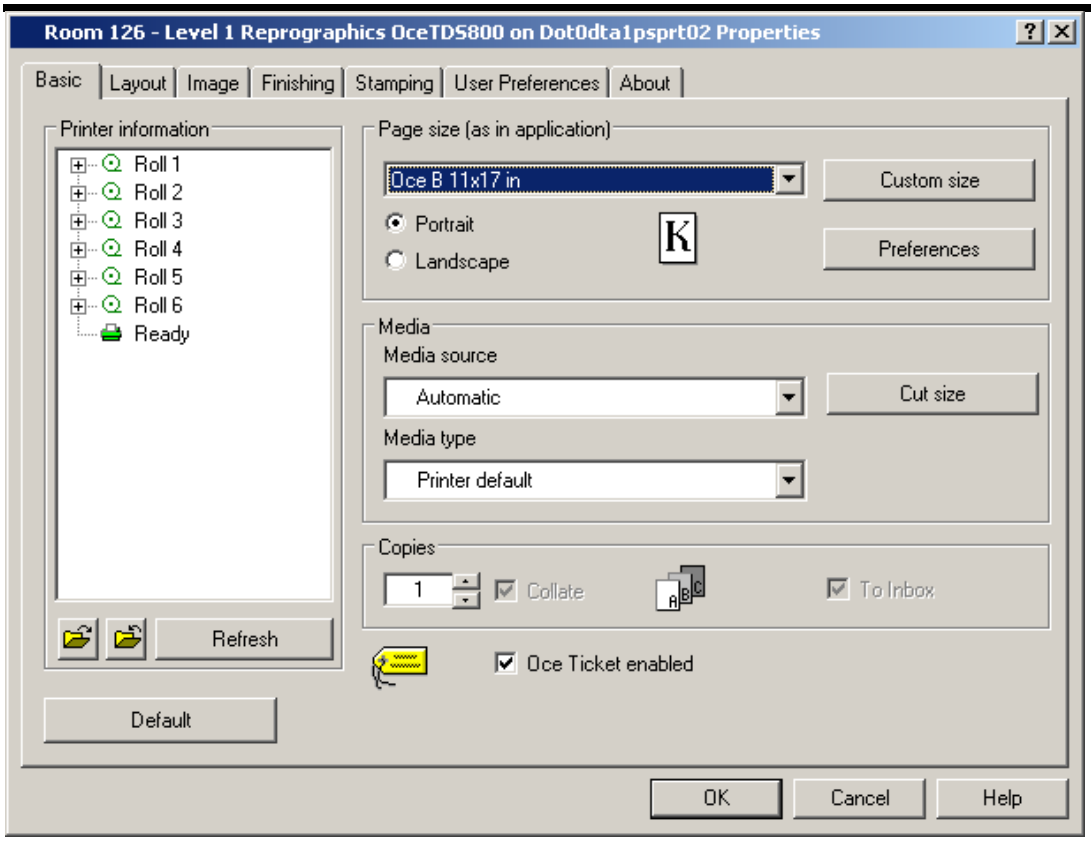


Figure 1-58: Adjusting the Custom Scale for Half size plots

- The *Preview* portion of the *Print* dialog will not display the correct dimensions for a half size plot, however, the 50% scale will happen when it reaches the plotter.

Select **OK** to start printing the PDF. A progress bar will appear displaying the printing progress.

PLOTTING TO PLT

Create MicroStation PLTs

- A plot file is only a "snapshot" of the file at its present state. Any changes made to the MicroStation file will not be represented in the plot file without recreating it. It is recommended that a user create a separate folder for the plot files and replace older ones as changes to the drawings are made.

Option One: Single Sheet Printing to .plt

Creating a plot file is as easy as printing to a plotter. A single file can be created as a plot file by placing a fence around the drawings plot boundary and picking the plot driver **PLOT2FILE** (select the US version for US Customary project) from the plotdrv folder. The file will be created in your active MSTA folder. This is a full size plot .plt(.000), however the *Print Exec Workgroup* can scale the image to halfsize if that's your desired hardcopy size.

Option Two: Batch Printing to .plt

When Batch Printing, select the **PLOT2FILE** printer from available printers. The files will be created in your active MSTA folder. *Print Exec Workgroup* can use the .plt to print full size or scale the .plt to halfsize if that's your desired hardcopy size.

USING PRINT EXEC WORKGROUP

Overview

This program is used to submit up to 100 files (per job) at once to the black and white OCETDS860 (Reproduction Room 126) & OCETDS600 plotter (RM312) at MaineDOT in Augusta. You can create multiple jobs when a project is over 100 sheets or create a multi-page .pdf. The user can save and retrieve jobs when additional prints are necessary. The Print Exec Workgroup application is a replacement for the Oce Job Director that some people may have used in the past to send CADD plot files (.plt) or .tif images from a CD archive.It will not handle .dgn files directly. You must create one or the other to take advantage of the job capability in Print Exec Workgroup.

Help

This document is not intended to cover all options within Print Exec Workgroup. A PDF help document provided by OCE on their product fully describes everything you need to know about Print Exec Workgroup and more. A HELP menu is also available internal to the application. To review the PDF document, click this link → OCEPrintExecWorkgroup or browse to \\dot0dta1fscadd1\pcpin1\msworksp\documentation\mdot\OCEPrintExecWorkgroup.pdf .

Plotters Available

OCETDS860-rm126

This plotter only has a table output delivery system which will print your jobs in reverse order unless you place a check make in the *Reverse Order* box.

If sending a multi-page PDF, *Batch Print* in reverse order and do not place a check mark in the *Reverse Order* box.

OCETDS600-rm 312

The OCETDS600-rm312 has two paper outputs trays available. The “table” option where plots exit in reverse order or an “Ascending order” option using the intregated tray on the top of the machine for plots to be sorted in Ascending order.

If sending a multi-page PDF, select the *Ascending Order* option as the preset configuration.

Step One: Adding Files to Print Exec Workgroup

Part One: Open Print Exec Workgroup

Click here →http://10.10.18.101 (OCETDS860-rm126) http://10.10.18.235 (OCETDS600-rm 312) or open a webpage and type the IP in the address bar, or pick it from your favorites menu. Click on the page to activate the controls. The opening page displays the plotter information. Click the **Submission** tab (Figure 1-59).

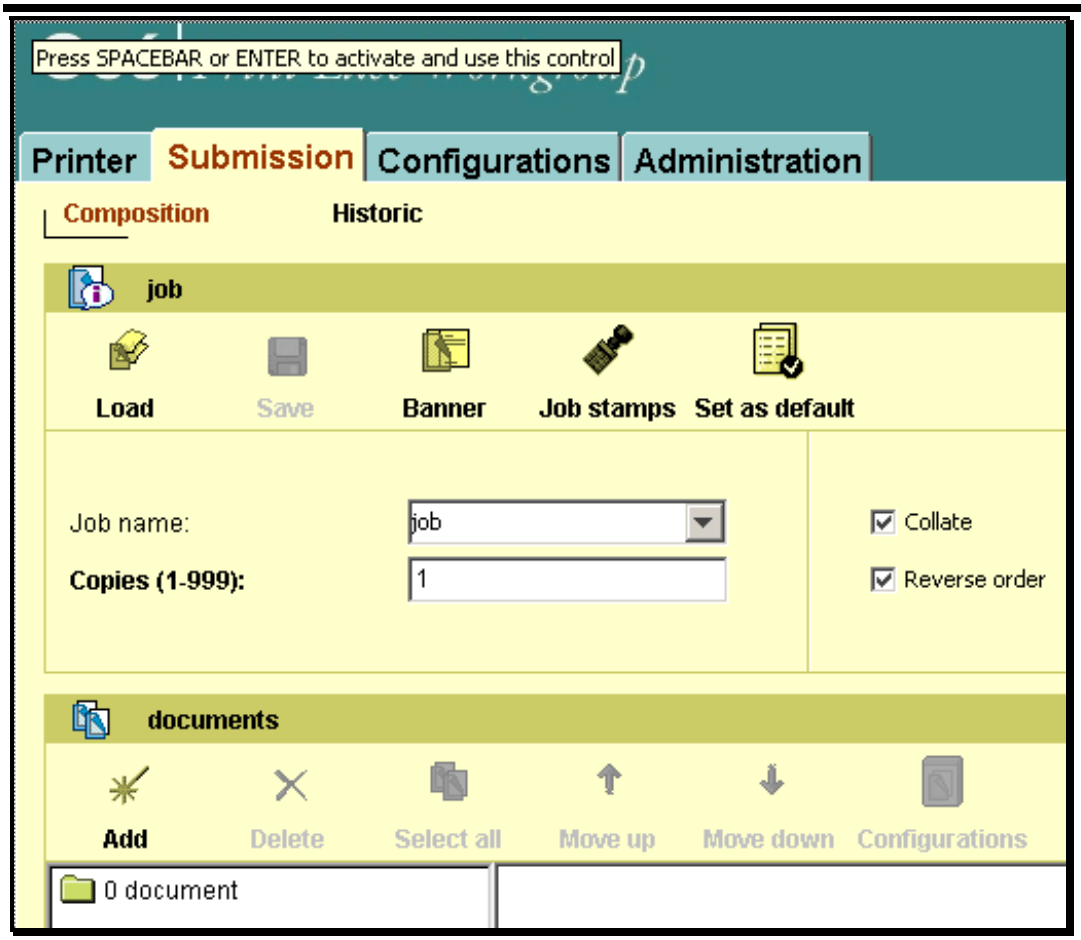


Figure 1-59 Print Exec Workgroup Dialog

Part Two: Select Add

In the *Documents* portion of the dialog, click the **Add** button (Figure 1-59). Click cancel to any warnings pop up saying that a link can't be found.

Part Three: Browse to File Location

Browse to your file location. Select them and click *OK* when finished adding files or *Add to Job* if you need to pick and choose files and/or browse elsewhere (Figure 1-60).

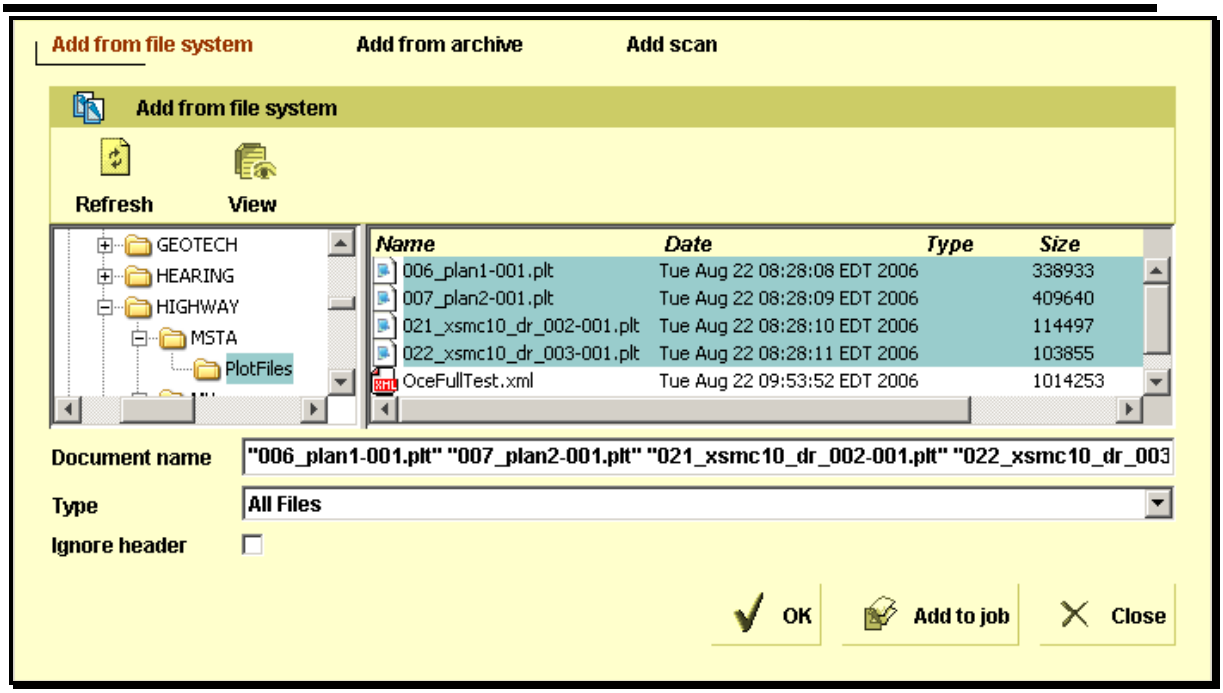


Figure 1-60 Add files dialog

Part Four: Check "Reverse Order/Collate"

Place a check in the **Reverse Order** button (Figure 1-59) so that the plots come out of the plotter with the last sheet first placing the first sheet on top (OCETDS860 or *Table* option on the OCETDS600). The OceTDS600 has a second paper handler for printing to *Asending Order* that doesn't require *Reverse Order* sorting. Make a selection based on this information.

Place a check in **Collate** (Figure 1-59) if printing multiple copies.

Part Five: Select the number of Copies

Change the number of copies if more that one is required (Figure 1-59).

Part Six: Select Preset Plot Configuration

Highlight your files or click the folder above them to select them all. Click the **Configurations** button (Figure 1-59). Change the radio button to *All* (Figure 1-61). For full size plots, select **MicroStation_Fullsize**. For half size plots, select **MicroStation_Halfsize**. Click *Apply*. Click OK.

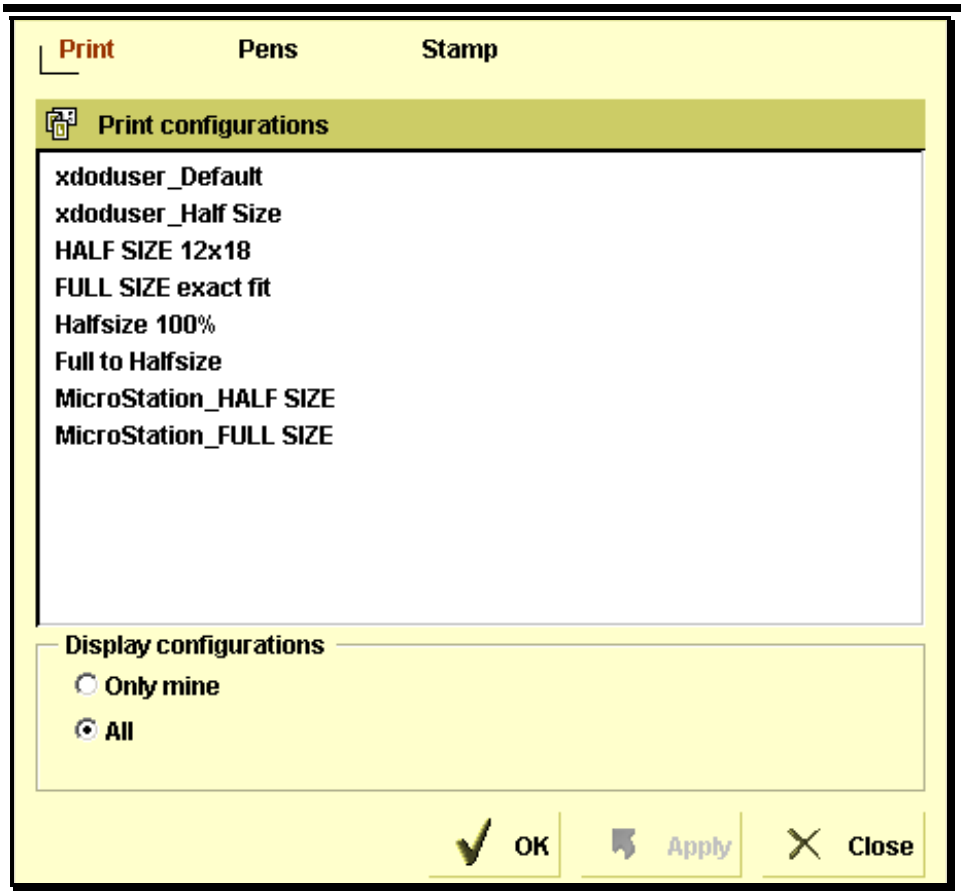


Figure 1-61 Select the appropriate MicroStation size.

Part Seven: Save Job with Documents (Optional)

Supply a name to your "job" file if you will need to recall it in the future. Saving the job with documents makes the job very portable and the job file larger (Figure 1-62). Using this option isn't necessary in most situations.

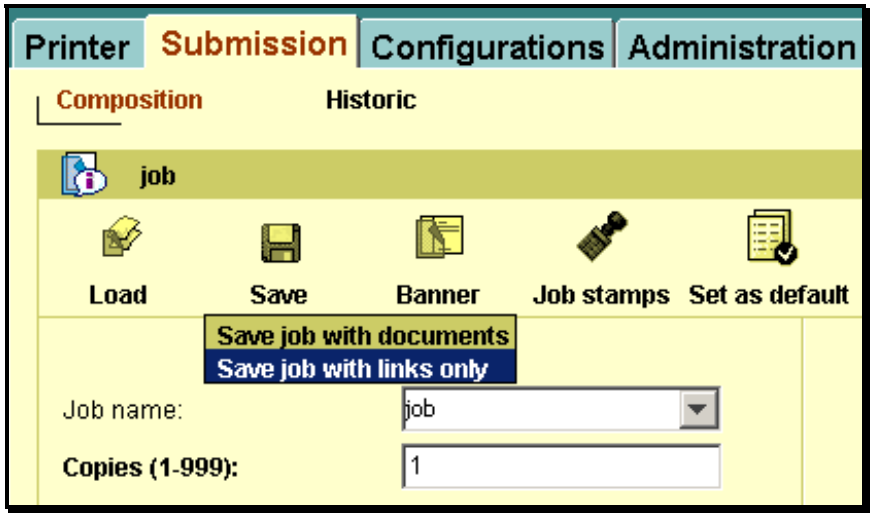


Figure 1-62 Save Job Options

Part Eight: Save Job with Links Only (Preferred Method)

Supply a name to your "job" file if you will need to recall it in the future. "Saving the job with links only" (Figure 1-62) makes the job file smaller and requires that your files (.pdf or .plt) are on the network. Make multiple job files for project with more than 100 pages in your plan set.

Part Nine: Print

Select the **Print** button.

Recalling a Previous Job

Click the **Load** button. Browse to your project location.

✓ *For more information on Print Exec Workgroup, please refer to the internal help file or click this link → OCEPrintExecWorkgroup to open OCE's user manual.*

Chapter 2 General Tools

FUNDAMENTALS

ELEMENT ATTRIBUTES

Setting Attributes

Every element placed in your MicroStation design file is placed with *Attributes*, including color, level, style, and weight. These are reflected in your **Attributes Tools Box** (Figure 2-1).

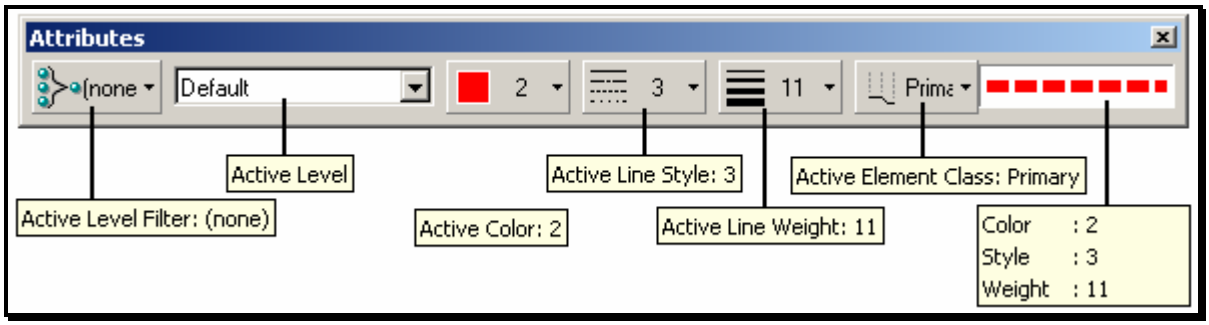


Figure 2-1: Attributes Tool Box

When you go to change an Element's Attributes, you can see these *Active Attributes*, along with another setting for your *Active Class* (Figure 2-2).

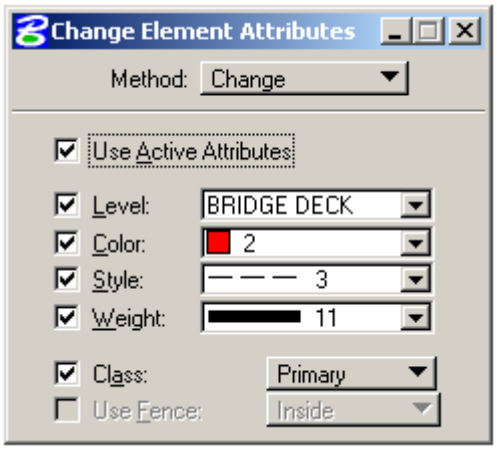


Figure 2-2: Change Element Attributes Setting

- Element Attributes can be matched by changing the *Method* to *Match/Change.* Making elements *Class-Construction* is a way of marking "junk" lines in MicroStation as. This makes it easy to avoid plotting them. You can turn off the display of *Construction* elements from the **View Attributes** dialog (**Settings > View Attributes**).

Settings Manager

You can let the *Settings Manager* take care of all these *Element Attributes* for you.

For example, choose **Exist. Roadway Lines > Sidewalks** from the **plan.stg** *Settings Manager* (Figure 2-3).

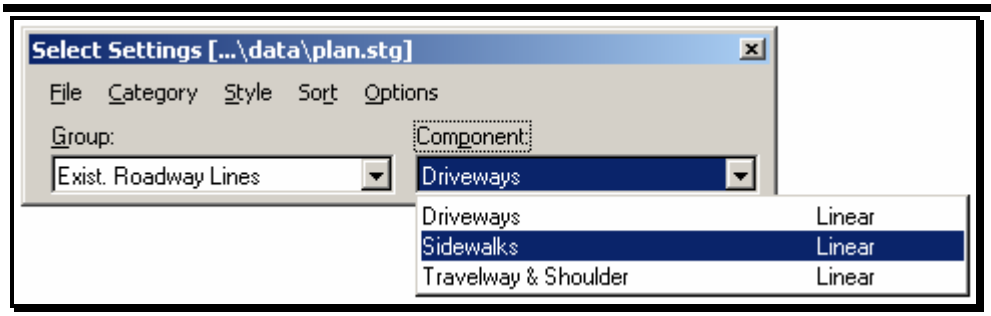


Figure 2-3: Pick a Component

This not only launches the *Smartline* command, it also sets your active color, style, weight and level for proper placement of existing sidewalk lines (Figure 2-4).

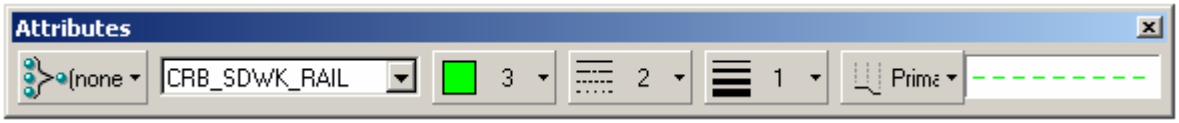


Figure 2-4: Sidewalk Setting

Level Display

The *Level Display* (Figure 2-5) can be launched from the main menu by selecting **Settings > Level > Display, Ctrl+E** or click the **Level Display** on the *Primary Tools* tool box.

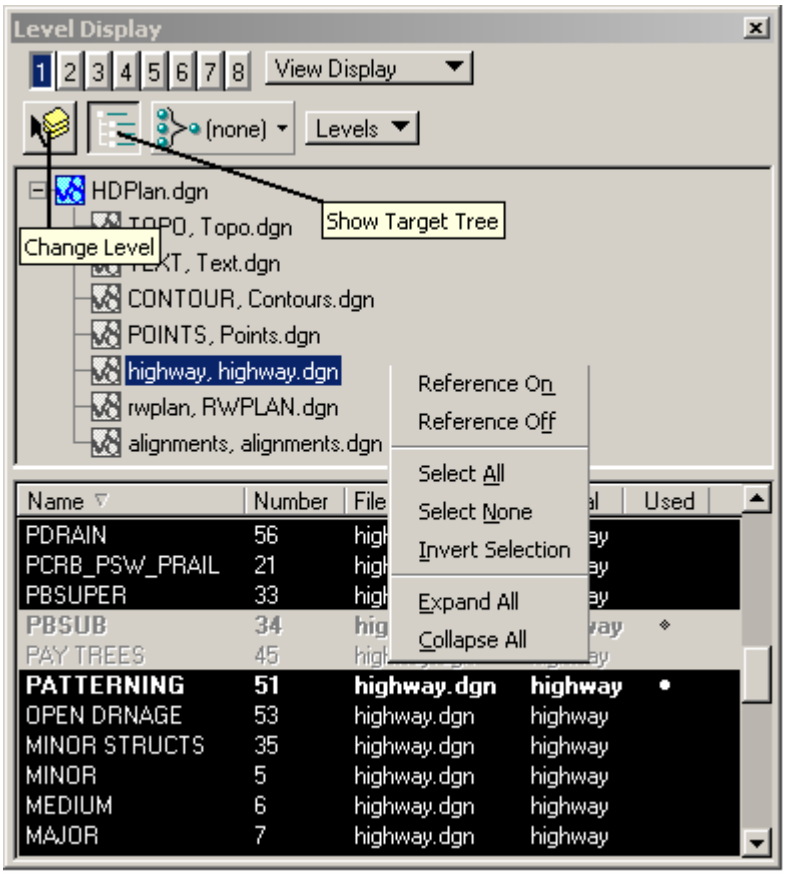


Figure 2-5: Level Display Dialog

This is a simple overview of some of the management options using the **Level Display.**

If the *Reference Files* or the active file is not displayed, **Click** on the **+** before the file, the **Show Target Tree** icon or **Right Click** and select **Expand All** from the menu to expand the file tree.

To toggle the display of levels in a file, **Click** a level if being used (white on black with a dot in the *Used* column) it will turn the level off and changes the white to black. If the level is off when clicked the change will be from black to white and turned on. All levels can be toggled by **Right Clicking** on a level and selecting **All On** or **All Off** from the menu. To turn off levels graphically, select the *Change Level* tool (Figure 2-5), in the *Level Display* dialog box, select the *Change Level* icon, choose **Level: Display Off** from the *Change Level Dialog* (Figure 2-6) and Data Hit the Element on the screen.

Figure 2-6: Change Level Dialog

The whole *Reference File* can be toggled by **Right Clicking** on the file and selecting **Reference On** or **Reference Off** from the menu.

Level Manager

The *Level Symbology* is now manipulated with the **Level Manager** (Figure 2-7). The *Level Manager* shown below does not display all of the columns available. By **Right Clicking** on the **Used** column header a menu appears showing other unchecked columns available. The *Level Manager* is displayed by clicking on the *Active Level* on the **Status Bar, Ctrl+L** or the *Level Manager* icon on the *Primary Tool Box.*

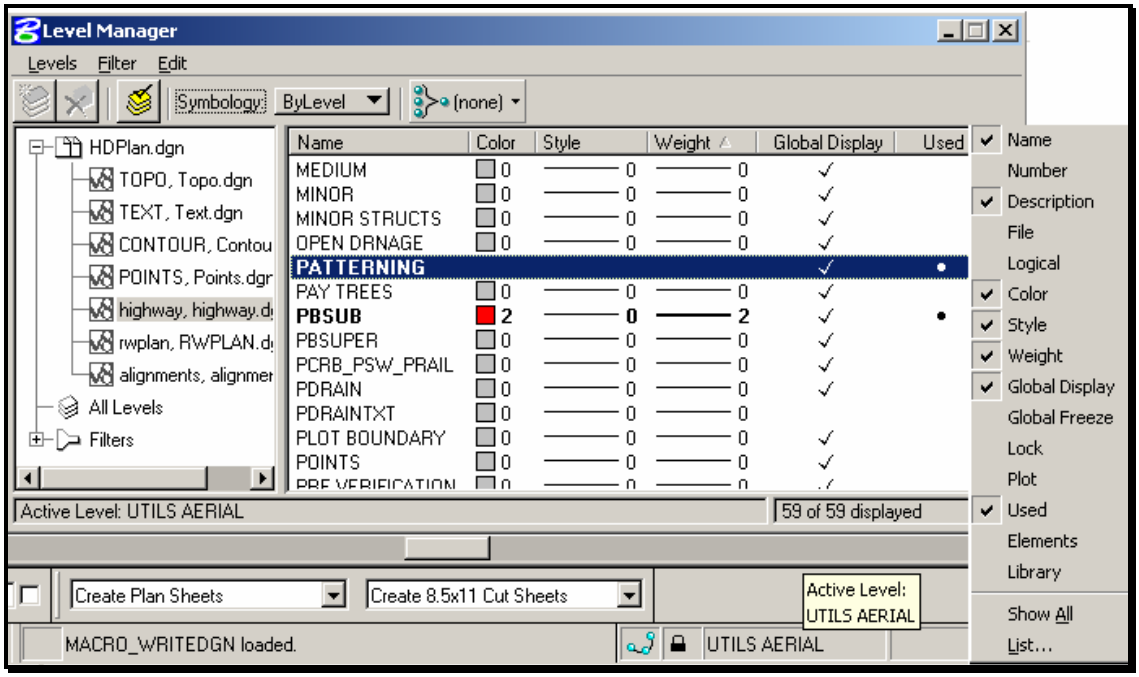


Figure 2-7: Level Manager Dialog

Most of our element symbology is set using the *Settings Manager* dialog. On occasion for viewing or plotting color, weight, or style needs to be manipulated without make actual changes to the element symbology. If necessary the *File Tree* can be expanded by clicking on the + beside the *Active File* in the *Level Manager Dialog*. Elements Symbology on every levels of each file can be changed by selecting the file on the left and the level from the right of the *Display Manager*. By clicking the checkmark in the Global Display column the graphic display of that level will be toggled on or off.

To use symbology by level switch the **Symbology** option to **ByLevel.** Click the desired Level Name, change the Color, Style and/or Weight and click **OK** to accept the change.

To override the symbology of a level switch the **Symbology** options to **Override**. **Right Click** on a level will bring up a menu with other options.

To view the symbology changes **Check** on **Level Symbology** and **Apply** in the *View Attributes* dialog (**Settings>View Attributes** or **Ctrl+B**). When the *Level Symbology* is uncheck the element attributes will return to normal.

SNAPS

Most of the elements placed are connected to previously placed elements. Snaps are use to accurately place points on a drawing. To tentative hit on an element **Snap Lock** has to be toggle on. To view the *Locks* (Figure 2-8) from the main menu **Settings>Locks>Full** or click the **Lock** on the *Status Bar* and select **Full**.

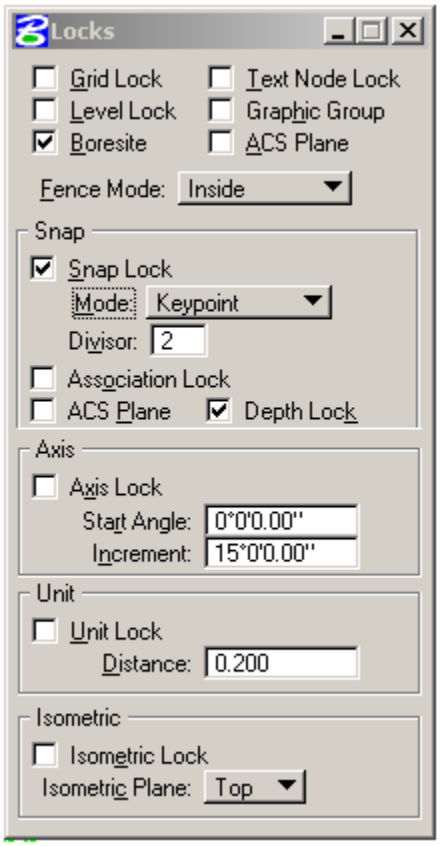


Figure 2-8: Locks Dialog

A *Snap Mode* can be locked by changing the **Mode:** in the Snap field of the *Locks Dialog* or by holding down the **Shift** key and selecting the *Snap Mode* from the *Status Bar*. To use the snaps for one snap, use *AccuDraw* shortcuts for some or select the snap from the *Status Bar*. For a complete list of *AccuDraw* shortcuts, click in the *AccuDraw* and type **"?" (Shift+?).** To view all the available *Snap Modes:* **Settings>Snaps>Button Bar** or click the Snap Mode on the *Status Bar* and select **Button Bar**. Right Click on one of the icons on the *Snap Mode Dialog* (Figure 2-9) and a menu of all the snap mode which can be toggled will appear.

Figure 2-9: Snap Mode Dialog

Below is view and brief description of the available snap modes.

Toggles AccuSnap: Turns AccuSnap on and off

Nearest: A Point on the element nearest to the curser .

Keypoint: Locates an element keypoint: end, middle, center, etc. The snap most commonly used.

Midpoint: Midpoint of an element

Center: Center of circles, arcs, text, shapes, etc.

Origin: Origin of a cell, text justification, similar to the *Center Snap*

Bisector: Midpoint of an entire line string, multi-line, or complex chain, rather than to the midpoint of the closest segment.

Intersection: Intersection of two elements.

Tangent: Constrained to be tangent to an existing element.

Tangent From: Tangent from the existing element at the tentative point.

Perpendicular: Tangent to the existing element at the tentative point.

Perpendicular From: Perpendicular from an existing element

Parallel: A point parallel to an existing element

Through Point: A point through which the line you are placing will pass through

Point on Snap: A point along or extension of a element

AccuSnap

By hovering near a *Keypoint* of an element with the curser **AccuSnap** will display that point, the element, the type, level name and allow a *Data Point* to be placed at that point without a *Tentative Snap* (Figure 2-10).

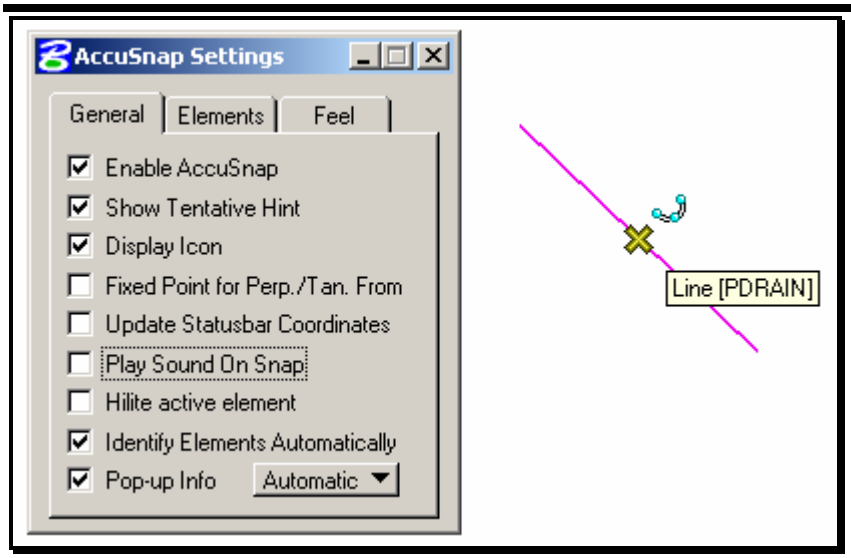


Figure 2-10: AccuSnap

AccuSnap can be toggled from the *Snap Mode Dialog* or the *AccuSnap Setting Dialog*. More settings are available with the *AccuSnap Setting Dialog* **Element** and **Feel** tabs.

Keypoint

Keypoint is used to snap to point on arcs or lines. The number of Keypoint on an element is set in the **Keypoint Snap Divisor Dialog** (Figure 2-11). The dialog can be open by typing **K** in your *AccuDraw* Window. The division can also be set from the main menu **Settings > Design File>Snaps**.

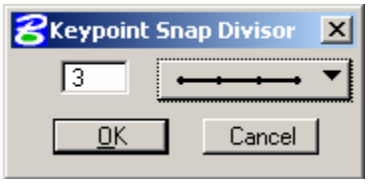


Figure 2-11: Keypoint Snap Divisor 3

Intersection

The *Intersection Snap* is used to locate the intersection of two elements. Locate one of the elements with a tentative snap which will highlight the element and just hover over the intersecting element with the curser and accept with a data snap when the *AccuSnap* appears on the screen. If *AccuSnap* is toggled off two tentative snaps, one on each element and a data snap to accept the point will be needed. You can continue snapping until the desired intersection is found; the last two tentative snaps define where the intersection point lies.

If the two elements do not actually intersect a point will be a projection where of one or both elements would intersect.

Center

The center snap can be used to snap to the center of a line, shape, circle, cell, etc. It requires one tentative. The tentative has to be placed on the *outside* of the shape – *do not* try to eyeball it and snap near the middle. (Eyeballing actually will work with circles, but not

with other shapes.) If *AccuSnap* is on, hover near the element and data hit when the *AccuSnap* appears.

Nearest

The nearest snap is used when you absolutely, positively have to get a point on an element, but you don't care (or don't know) exactly which point.

VIEW CONTROL

Overview

There are a number of view controls that you will use on a daily basis. You might want to edit your Function Keys to give you quick access to them. They include Zooming, Fit View, View Previous and View Next.

More Advanced view controls deserve another look.

Rotate View

Choosing the **Rotate View** (Figure 2-12) command gives you a number of choices.

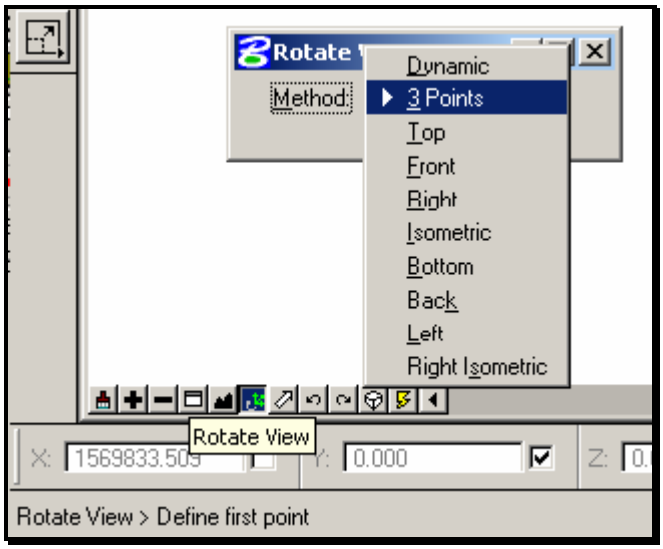


Figure 2-12: View Rotation Methods

The majority of these **Methods** relate to 3D view control. Remember that **Top** view is the default and always a safe starting point.

3 Points is the method of choice for rotating a view to something other than the default. The 3 points that you enter correspond to an xy axis. The first point is xy of zero (the coordinate origin). The second point defines the direction of the positive x-axis. The final point defines the direction of the positive y-axis.

- It is beneficial to have depth lock turned on for this operation.

3D Troubleshooting

Sometimes you will get unexpected results when you are working with 3D files. There are a couple of tricks that you can try out.

Flattening is always a good start.

Also make sure to rotate your view to “top.”

COMPLEX CHAINS AND SHAPES

Overview

Adjacent lines and arcs can be grouped together into *Complex Chains* and *Shapes*.

Creating Complex Chains

Use the **Create Complex Chain** tool to combine adjacent lines and/or arcs into a linear (non-closed) element.

- This allows you to measure length and construct distances along the combined element. It also speeds up modification and manipulation.

Activate the **Create Complex Chain** tool either from your **Main Tool Frame** (Figure 2-13) or from your main menu by selecting **Group > Groupings > Create Chain**.

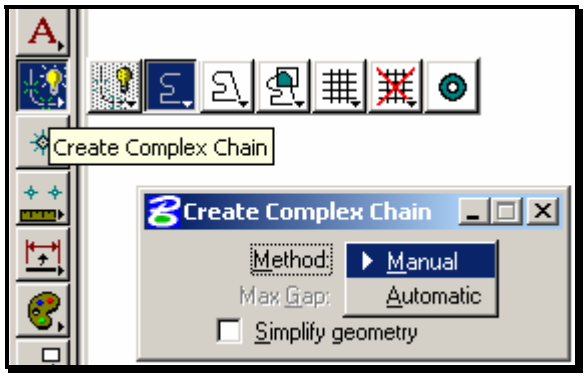


Figure 2-13: Create Chain

Using the **Manual** option, MicroStation prompts you to "Create Complex Chain > Identify Element." Pick each element you'd like to add to the chain, in order, until you have selected the entire chain.

ⓘ ***Make sure to* Accept *the final element in the chain.***

Reset to complete the chain.

Using the Automatic option, MicroStation will prompt you to "Automatic Create Complex Chain > Identify Element." Once you have picked that element, just *Data Point* to *Accept* it and MicroStation will automatically highlight the next element in the chain.

- MicroStation will jump gaps to complete these chains. Set the **Max Gap** value to tell it how far to look.

Keep *Accepting* until MicroStation completes the *Chain*.

If there is a fork in the path, MicroStation will highlight one possible path and prompt you with the statement "FORK – Accept or reset to See Alternative." Send a *Reset* if you don't like the path MicroStation has chosen.

Creating Complex Shapes

Use **Create Complex Shape** to combine adjacent lines and/or arcs into a closed (non-linear) shape.

- This allows you to measure length and area and construct distances along the element. You can also fill, pattern, or hatch the resultant area. It also speeds up manipulation and modification of the element.

Choose **Create Complex Shape** from the **Main Tool Frame** (Figure 2-14) or choose **Group > Groupings > Create Shape** from your main menu.

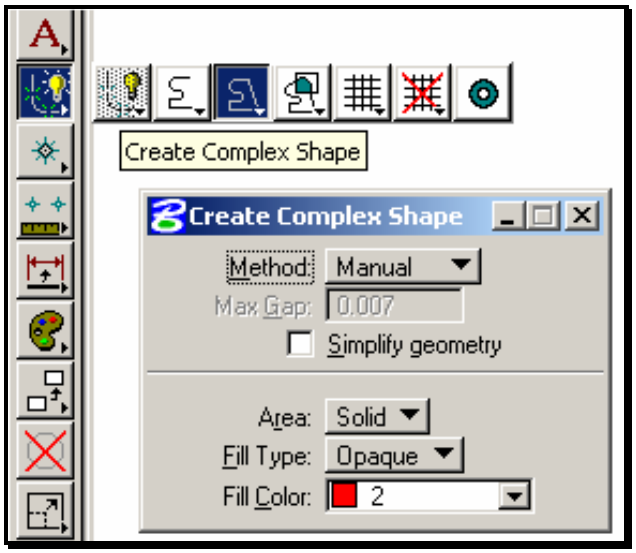


Figure 2-14: Create Complex Shape

Note that you have some of the same options here that you had in the **Create Complex Chain Tool Settings Window**.

Manual and **Automatic** creation procedures are much the same for **Shapes** as they are for **Chains**.

One notable difference is the fact that **Shapes** are only complete when they are closed. As soon as a **Shape** is closed by **Manual** or **Automatic** creation, the creation is immediately completed.

- If the end of the final segment does not correspond to the beginning of the first segment, MicroStation will draw a line that makes that connection.

Area

There are two choices for **Area** when you are creating a **Complex Shape**. They are **Solid** and **Hole**.

- This property is *only* relevant to *Hatching*. **Hole** elements cannot contain *Hatching* or *Patterning* elements.

It is strongly recommended that you do not ever place **Hole** elements in your drawing. It only leads to unnecessary confusion.

Fill Type

If you would like your resultant **Shape** to be either **Outlined** or **Opaque** you can make that selection here before you create the **Shape**.

Troubleshooting

Creating *Complex Chains* and *Shapes* is a fussy business: sometimes just a slight error can lead to unexpected results.

Extra Elements

Probably the most common mistake in creating *Complex* elements happens when the user *Resets* before the element is entirely finished. They realize they haven't created the entire *Chain*, and they go back to the beginning and re-create it.

The problem with this is that even though the first chain wasn't complete, it is still a legitimate element and MicroStation doesn't know that the user doesn't want it.

This ends up leaving all kinds of partial chains kicking around in your file.

- As a rule of thumb, don't forget to **Undo** your aborted efforts at creating *Chains* and *Shapes* before you go back and do it again.

COMPLEX REGIONS

Overview

While *Complex Chains* and *Shapes* are created by combining single, entire, simple elements, *Complex Regions* are *Closed* elements created through a more complicated interaction of multiple and potentially complex elements.

Launching the Tool

Choose **Create Complex Region** from you **Main Tool Frame** (Figure 2-15) or from your menu by choosing **Group > Groupings > Create Region**.

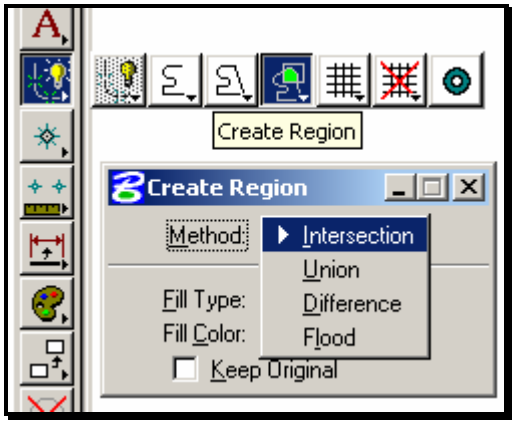


Figure 2-15: Create Complex Region

Complex Region Methods

In your **Tool Settings Window** you have four **Methods** to choose from. Starting from the circles and line in Figure 2-16, these four methods have the following effect:

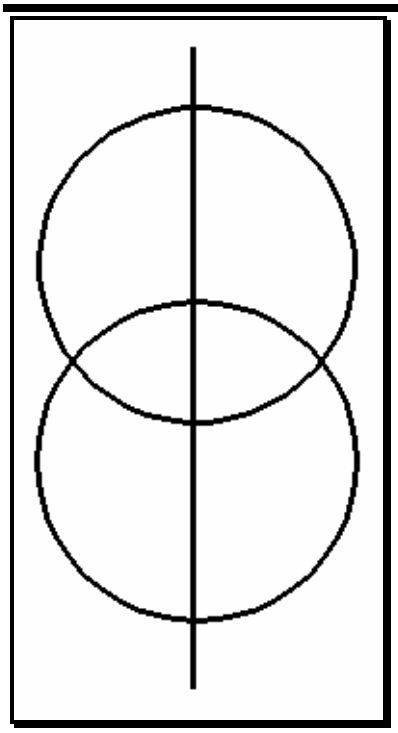


Figure 2-16: Starting Point

Intersection

Intersection creates a *Complex Region* out of the area where the two shapes overlap.

Choosing the two circles, the **Intersection** looks like Figure 2-17.

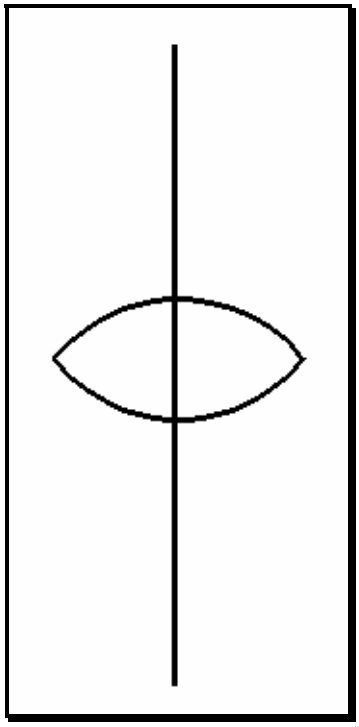


Figure 2-17: Intersection

Union

Union creates a *Complex Region* out of the outermost boundary of the shapes chosen.

Choosing the two circles, the **Union** looks like Figure 2-18.

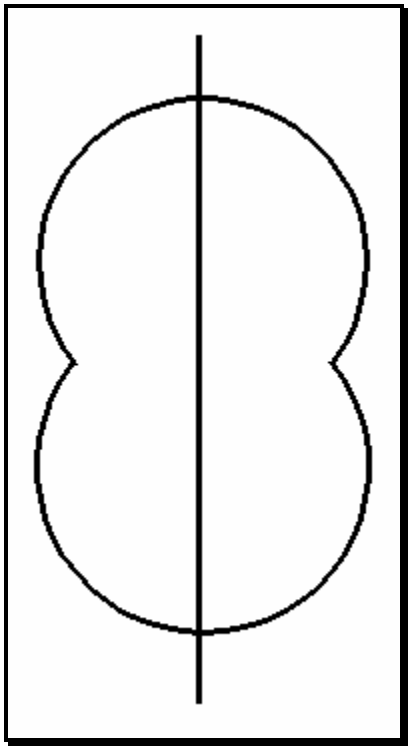


Figure 2-18: Union

Difference

Difference creates a *Region* that is the outside of the first chosen element, minus the outline of the subsequently chosen shapes.

Choosing first the top circle, then the bottom, the **Difference** looks like Figure 2-19.

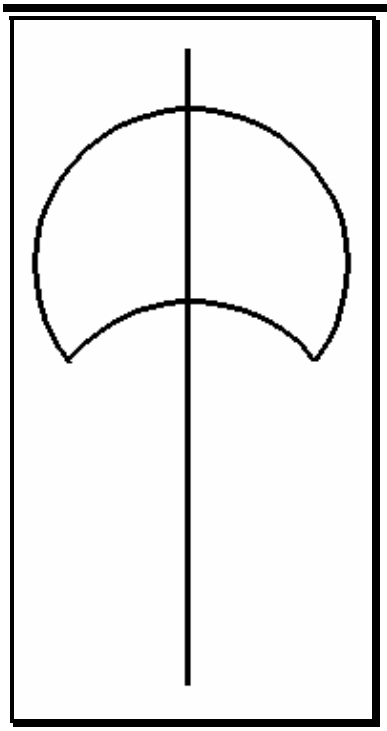


Figure 2-19: Difference

Flood

Flood defines an area by searching for enclosing elements around a *Data Point* sent by the user.

Sending a *Data Point* into the right side of the area where the two circles overlap looks like Figure 2-20.

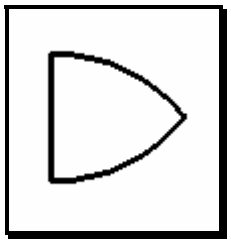


Figure 2-20: Flood

Fill

Note you have the same **Fill** options with *Create Complex Region* that you had with *Create Complex Shape*.

Keep Original

The examples above show the behavior of **Create Complex Region** with **Keep Original** disabled. Every element that contributes a piece to the resultant *Region* is deleted.

If you do not want these elements deleted, enable **Keep Original** from the **Tool Settings Window** (Figure 2-21).

Figure 2-21: Keep Original

Tips and Tricks for Flood

In congested areas on the drawing, it is sometimes difficult to use the **Flood Method**. Often, MicroStation will not find the correct *Enclosing Region*.

PowerSelector

To simplify matters, start by using the *PowerSelector* to pick only the elements that make up the outline you want to create a region from. Now use *Flood* and data point somewhere in this area. *Flood* will look only for highlighted elements when it looks for an enclosing *region*.

Adjust Max Gap

If MicroStation can't find an enclosing *region*, you may have some slight gaps between elements. Try changing your **Max Gap** value to a higher number (Figure 2-22). If you have to set it higher than .1, you may need to make sure that your file is flat and that you have selected all of the elements that make up your boundary.

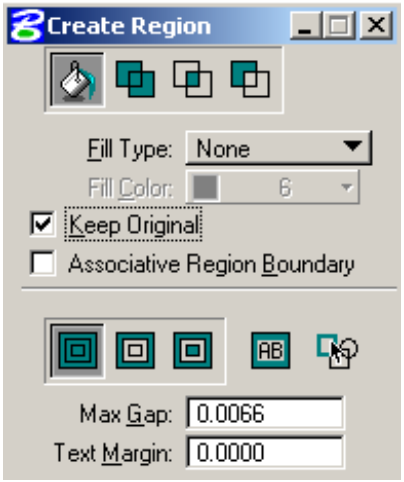


Figure 2-22: Create Region dialog – Max Gap

✓ *Check Flattening your Active File on page 2-87.*

Set/Lock Z to Zero

Another macro that will help make sure that you are measuring on the same plane and get the correct area measurement is called ZLOCKANY. This macro is kicked off by selecting *Macros>Set/Lock Z* from the *Main Menu* and setting the active depth to "0" in the 3D file.

INTRODUCTION TO THE SETTINGS MANAGER

The *Settings Manager* is our one-stop-shopping for establishing standard MicroStation procedures and properties. We are going to use it to develop everything from standardizing text height to launching macros.

STRUCTURE OF THE SETTINGS MANAGER

The *Settings Manager* works kind of like a menu structure: it has *Groups* and *Components*. Groups are like menus and Components are like the items on the menus. Picking a *Group* without picking a *Component* is kind of like opening up a menu without selecting an item: nothing happens. Think of the *Components* as buttons that need to be pushed to make something happen. When you haven't picked a *Component*, you haven't really *done* anything. *Settings Managers* are used to place elements on the proper level with correct weight, style and scale.

The Many Faces of the Settings Manager

One of the most confusing aspects of the *Settings Manager* is that it can take on a couple of very distinct appearances. Figure 2-23 shows what the *Settings Manager* looks like as a **Large Dialog**.

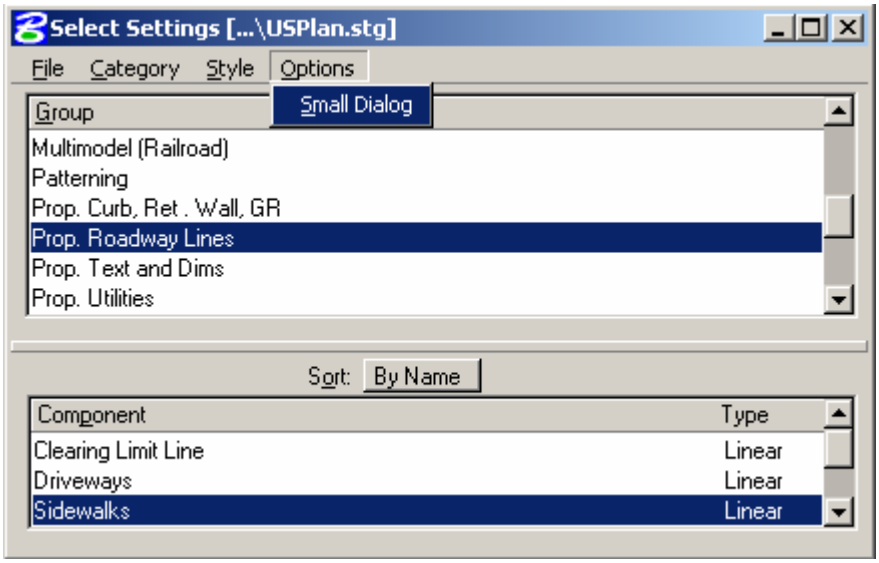


Figure 2-23: Settings Manager *Options*

This **Large Dialog** can be resized into the **Small Dialog** by choosing **Options > Small Dialog** from the Select Settings dialog. This will transform the **Settings Manager** to look like Figure 2-24.

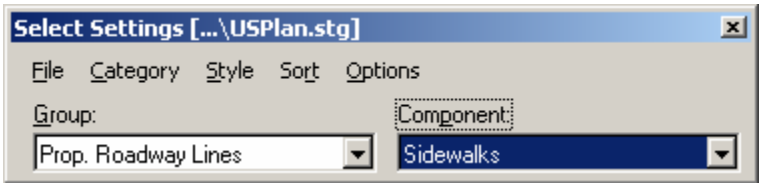


Figure 2-24: Small Settings Manager *Dialog*

From here, we can choose **Options > Large Dialog** to return to the large dialog, or we can pick **Options > Hide Menu Bar** to make the dialog even smaller (Figure 2-25).

Figure 2-25: Even Smaller Settings Manager *Dialog*

When the menu bars have been hidden, the only way to used item on the menu is by right clicking on the **Settings Manager**. This gives you the same options that were previously available from the **Select Settings** dialog's menu (Figure 2-26).

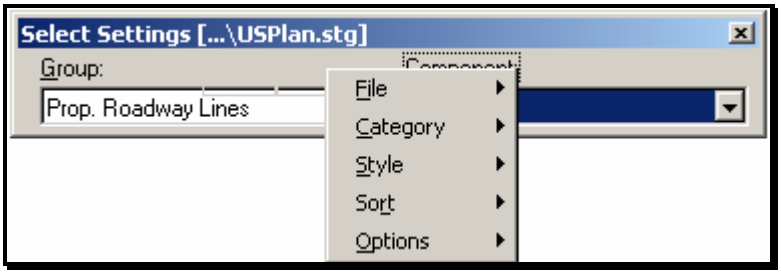


Figure 2-26: Right-click for Menus

The *Settings Manager* can be docked when in *Small Dialog* mode (Figure 2-27). The usual location for the *Settings Manager* is at the bottom. It is a user preference and is reloaded to the same location as when *MicroStation* is closed.

Figure 2-27: Docked Settings Manager

Opening the Settings Manager

The *Settings Manager* is autoloaded depending on the work group and the working units of the file, if the file is opened using the *MicroStation Manager* and a *PIN* is selected. Task-specific *Settings Managers* can be launched from your main menu by selecting **Settings > DOTSetMgrs > [Task]** or **File>Open** from the *Settings Manager Dialog* and selecting the **.stg** from *Open Existing Settings File Dialog.*

SETTINGS MANAGER SCALE

One of the primary functions of the *Settings Manager* is to help us standardize text and dimension size. It can also help us make sure that our symbols and cells all come into our drawings at the right size. This is accomplished through careful manipulation of the **Settings Manager Scale**.

Real World Size Vs. Paper Size

There is some confusion over the concept of drawing *"One to one"* or *"Full Size"* and how that impacts the *scale* of the drawing. If you're drawing *one to one*, how could you possibly have a *scale* applied? Isn't everything *full size?*

The answer is "yes -- but there is more than one kind of *full size*."

How is that possible?

The AutoCAD terminology for this calls the two sizes "Paper Space" and "Model Space."

When you're detailing up an abutment, you want to make sure that a 6 meter wing measures 6 meters on the drawing -- that's "Model Space" -- your "Model" of the abutment measures the same size in your file that it will measure out in the field.

But what about when you want to annotate the abutment? You know that when you get your finished plot back from the printer you want your annotation text to be 3 millimeters high. But what does that 3 millimeters mean to your 6-meter wing? Nothing -- because those 3 millimeters are in "Paper Space" instead of "Model Space."

So how do you reconcile the two? That's where the **Setting Manager Scale** comes in.

Selecting a Scale

Right-click on your **Settings Manager** to open your options menu and select **Category > Scale** (Figure 2-28).

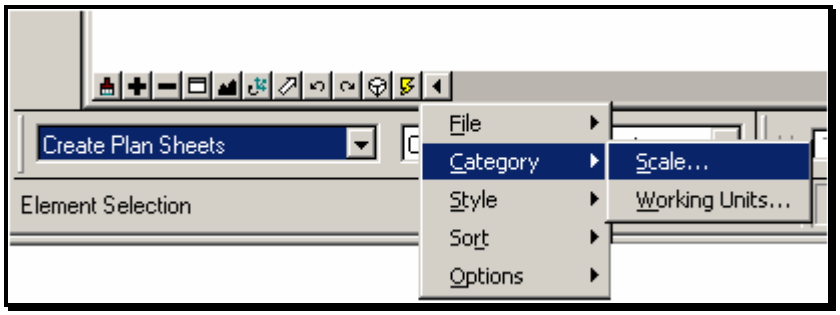


Figure 2-28: Right-click on the Settings Manager

This opens up the **Select Scale Dialog** (Figure 2-29).

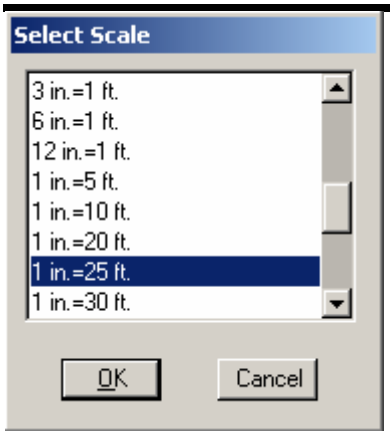


Figure 2-29: Select Scale Dialog

Let's say we select 1in. = 25 ft. (1:300) as our scale.

What does this change?

What does this do for us? All this does is alert the *Settings Manager* to our intended plot scale. From here on out, anything that we launch from the *Settings Manager* is going to know that it needs to be at the selected scale. We'll see the impact of this when we use the *Settings Manager* to place text and dimensions, as well as certain cells, linestyles and borders. It does this by changing the text height or by setting the **Active Scale**. It does not change the size of elements in your drawing.

- Note again that this has no impact on items already placed in the drawing.

This is not at all like changing our *Working Units*. *Settings Manager* uses its internal scale settings only to help you place new text and cells at the right size. Once your text has been placed, you can do whatever you want to your *Settings Manager* scale and it will not impact the text on your drawing (however, as soon as you place more text by selecting **Text > Text Note** from the *Settings Manager*, it will set your text size to reflect your current *Settings Manager* Scale.)

SETTINGS MANAGER WORKING UNITS

Another thing that we are going to use *Settings Manager* for is to control our *Working Units* settings. This is going to help us to draw imperial details on a Metric sheet and vice versa.

ⓘ ***A better way to accomplish this is to pick Macros>Unit Swap (m<->'). This toggles you from one set of working units to another (Feet to Meters).***

Choosing a Working Units Setup

From the **Settings Manager** choose **Category > Working Units**...(Figure 2-30)

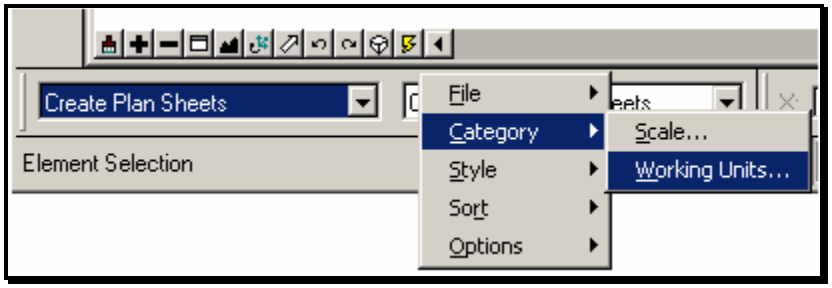


Figure 2-30: Category > Working Units

This will open up the **Select Working Units** dialog (Figure 2-31).

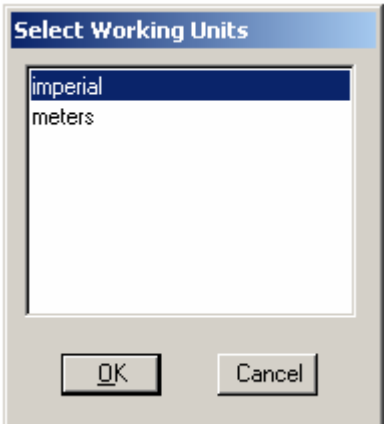


Figure 2-31: Select Working Units

The Defaults

All metric work should be done in **meters**.

All imperial work should be done in **imperial**.

All the other options are maintained only for backward compatibility.

Switching to U S Custom

If you are working in **meters** and you need to draw up an existing detail that is dimensioned in U S Custom units, you can switch your *Working Units* temporarily to **imperial**. Make sure to switch back to **meters** when you're done.

FENCES & GROUPS

SELECTION SETS

Select All

From your main menu, choose **Edit > Select All**. MicroStation will pick every element in your file.

ⓘ ***Even elements that are not currently displayed will be selected. This includes construction elements and elements on levels that have been turned off.***

Select None

To clear a *Selection Set*, you can always choose **Edit > Select None** from your main menu.

Element Selection

The Element Selection tool (Figure 2-32) can be used to pick single or multiple elements for processing.

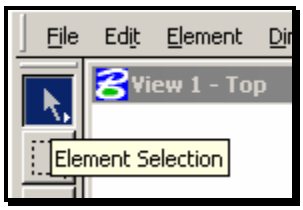


Figure 2-32: Element Selection

- Use of Element Selection changes the order in which you pick commands. Generally you pick your command first, then the element you want to affect. Using any element selection tool, you pick your elements first, then the command to alter them.

To select more than one element, hold down the **Ctrl** key when you click on new elements. If you select the wrong element, hold down the **Ctrl** key and click on it again to remove it from the *Selection Set*.

- Notice that when you add elements to a *Selection Set*, MicroStation displays the number of elements you have selected. This number is displayed in the right corner of your *Status Bar* as shown in Figure 2-33.

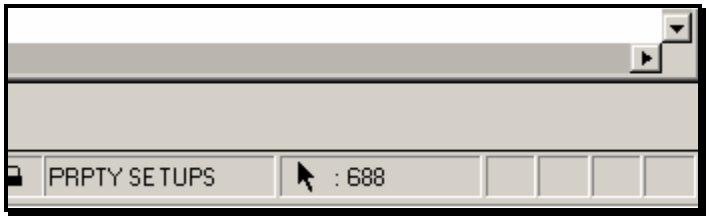


Figure 2-33: Count of Elements

To select elements over a wide area, click in empty space and drag. This will create a box. Elements entirely inside this box will be added to the *Selection Set*.

If you hold down **Ctrl + Shift** and drag the same box, it will add all elements overlapping the box to the *Selection Set*.

PowerSelector

The PowerSelector (Figure 2-34) is a more powerful way of quickly assembling *Selection Sets*.

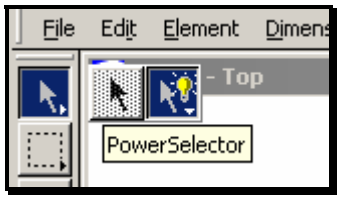


Figure 2-34: PowerSelector

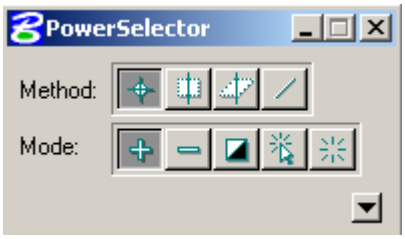


Figure 2-35: PowerSelector Tool Settings Window

The PowerSelector has a number of **Methods** and **Modes** of operation (Figure 2-35).

By changing **Methods** and **Modes**, elements can be added, subtracted, or inverted to a *Selection Set*.

Methods

By changing your **Method,** you can identify items singly, by block, shape or line.

Individual: selects graphically one element at a time

Block Inside: elements inside the block are selected

Block Overlap: overlapping elements plus those inside the block are selected

Shape Inside: elements inside a shape are selected

Shape Overlap: overlapping elements plus those inside a shape are selected

Line: selects elements that intersect a line

Modes

Add: adds elements to a selection set

Subtract: subtracts elements from a selection set

Invert: toggles the selection status of an element

New: clears the current selection set and starts a new set.

Clear/Select All: deselects all selected elements, or selects all elements if no elements are currently selected.

- Block and Shape **Methods** can be switched from **Overlap** to **Inside** just by clicking again on the respective icon in the **Tool Settings Window**.

"Permanent" Grouping

Once you have elements gathered together into a *Selection Set*, you might want to "cement" them together.

With the elements selected, pick **Edit > Group**.

Notice that once you have grouped elements together, the number of elements in your *Selection Set* drops to "1".

These elements have been joined together the same way elements of a cell are joined together. The only difference is that these "cells" don't have cell names. MicroStation refers to them as *Orphan Cells*. They can be modified and manipulated exactly the same way cells are. To drop these *Orphan Cells* back to their original independent state, use the *Drop Complex* tool.

ADVANCED POWERSELECTOR

Setup

There is a little arrow in the lower right-hand corner of the *PowerSelector Dialog* (Figure 2-36).

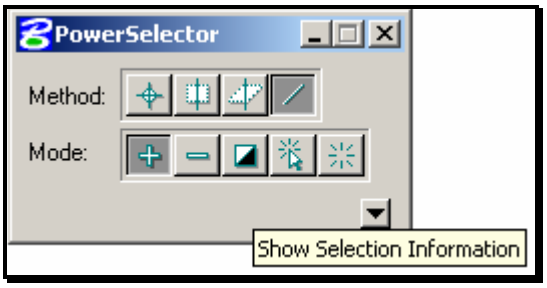


Figure 2-36: Show Selection Information

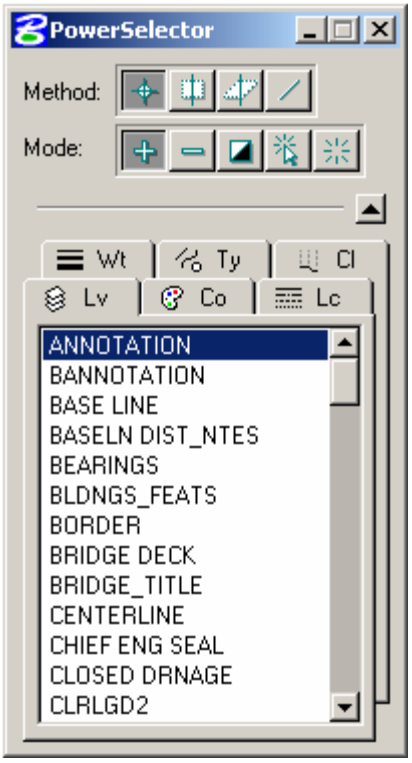


Figure 2-37: Expanded PowerSelector

To expand the *PowerSelector* click on the **Show Selection Information** arrow to reveal the Attribute tabs (Figure 2-37).

Tabs

Lv (Level): select levels from a list

Co (Color): select the required colors from a list (plus By Level).

Lc (Style): select the required line styles from a list (0–7 plus custom line styles present)

Wt (Weight): select the required line weights from a list (0–31 plus By Level).

Ty (Type): select the required element types from a list.

Cl (Class): select the required element classes from a list.

Adding Elements

Say you want to add all elements in a level to your *Selection Set*.

Start by choosing **Lv** tab from your **Tool Settings Window**.

Now **Click** the *Level Name* from the list of level names. Notice that the elements are highlighted and the level name moves to the top of the *Lv* list (Figure 2-38).

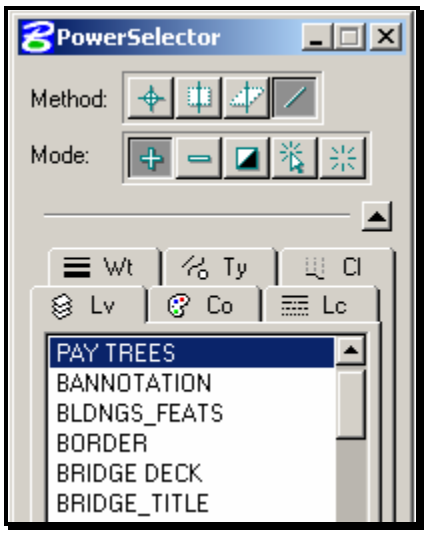


Figure 2-38: PowerSelector Lv Dialog

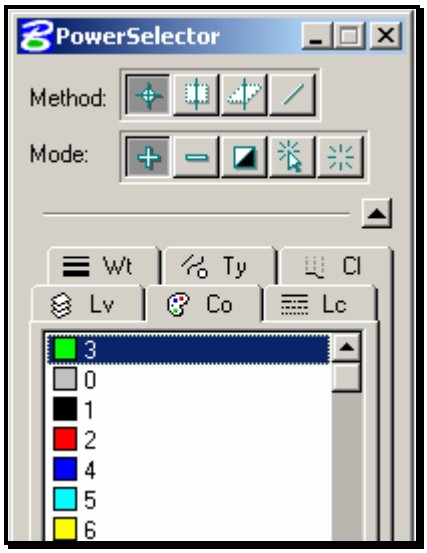


Figure 2-39: PowerSelector Co Dialog

All elements on **PAY TREES** level have been added to your *Selection Set*.

Now add all elements of color 2 to the set by choosing **Co tab** from the *PowerSelector*. Notice that *Color 3* is at the top of the list (Figure 2-39).

The *Color 3* is the color of elements already selected (elements on the PAY TREES level that was selected above from the *Lv* tab). To add color 2 to this list, **Click** the cursor in the "color **2**". Notice in (Figure 2-40) number *2* moved to the top with *3*. All the elements with the color *2* have been added to the *Selection Set.*

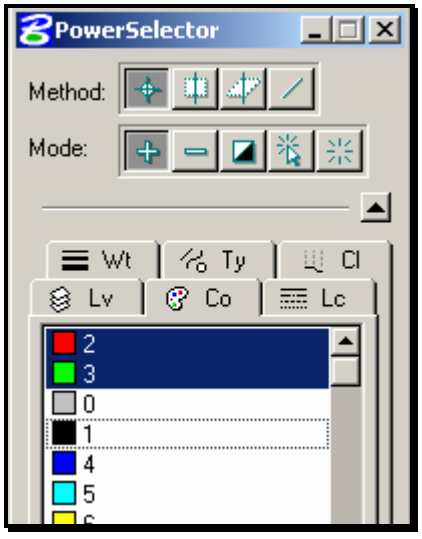


Figure 2-40: PowerSelector Co 2,3

ⓘ ***This does not mean that all elements of color 2 and 3 are selected: it only means that there are elements of these colors in this Selection Set.***

Subtracting Elements

You can also use this feature to remove specific colors, levels, styles and weights from your selection set. Start by selecting all *Levels* that have elements, either by choosing **Edit > Select All or** by **Clicking** on the first level that is not high lighted and dragging to display all of the levels and release. Now check out the **Lv** tab, all the levels that are present in the *Selection Set* (Figure 2-41) have elements.

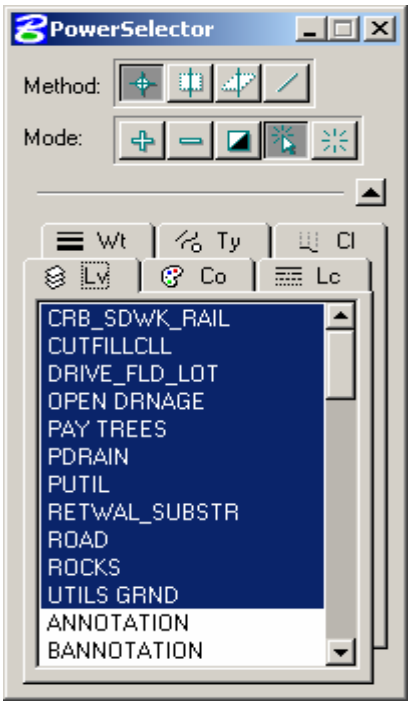


Figure 2-41: All Levels Picked

Clicking on the level name will remove all the elements on that level from the *Selection Set*.

Color, Style, Weight, Type and Class

By **Clicking** on the list from Color, Style, Weight, Type and Class tabs the elements can be manipulated the same way as the *Levels*.

SELECT BY ATTRIBUTES

Overview

Select By Attributes is an extremely useful tool for making focused alterations to a design file. You could use it to help accomplish any of the following:

Move all text to MINOR.

Delete all lines that are **Color 5** and **Weight 4**.

Change all elements on PBSUPER to be Construction elements.

The *Select By Attributes* tool allows you to specify certain *Element Criteria*. It then searches through the file and selects elements that match those search criteria.

The **Select By Attributes Dialog** (Figure 2-42) can be opened from the main menu by selecting **Edit > Select By Attributes.**

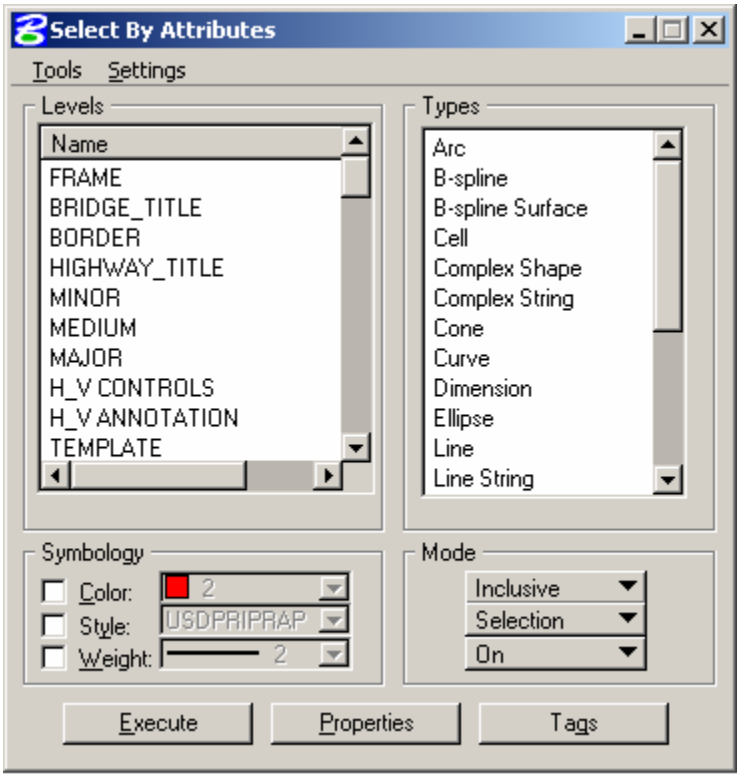


Figure 2-42: Select By Attributes

Standard Methods

The simplest application of the *Select By Attributes* tool uses the default settings.

In the **Levels**, **Symbology** and **Types** areas of the **Select By Attributes** dialog pick your search criteria. The example in (Figure 2-43) shows what the dialog would look like if you wanted to pick all text in levels **PRPTY ENVRN** and **RIGHT OF WAY** that is also of color **5**.

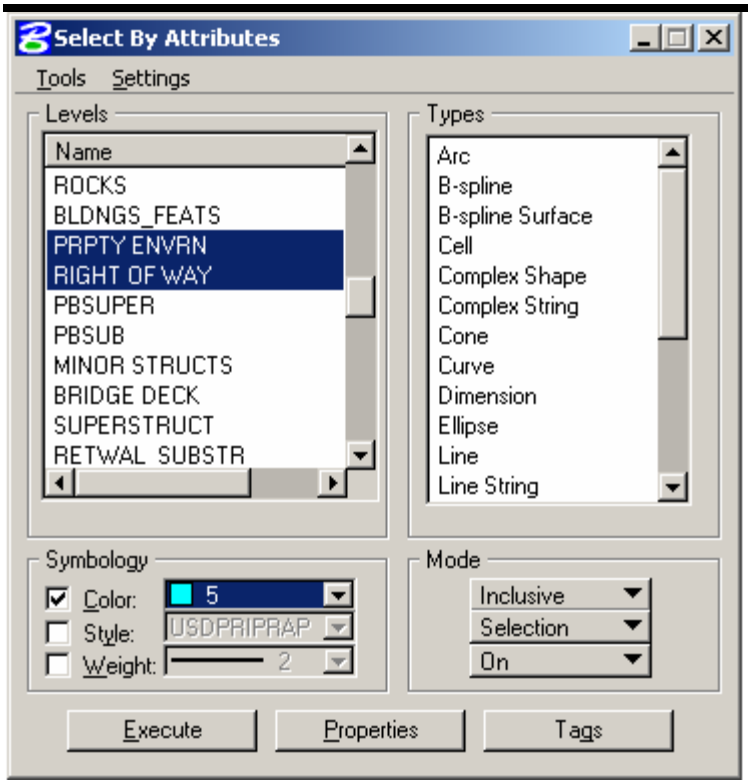


Figure 2-43: Select By Attributes Dialog

- Note that since **Style** and **Weight** are not selected, this process will identify elements of any style or weight.

Push the **Execute** button and MicroStation will add all elements that match these criteria to a *Selection Set*.

Element Type Hints

The **Types** are of the **Select By Attributes Dialog** is not always straight forward. Here are a few hints that should make it easier to select the elements you want.

Multi-line text is **Text Node** type. Single-line text is the **Text** type. Typically, if you want one, you want both of them.

For circles, the **Type** you want to choose is **Ellipse**.

To pick Smartlines with arcs in them, choose the **Complex String** type.

Similarly, any closed area with arcs would be the **Compels Shape** type.

Smartlines without arcs are **Line Strings**.

All closed polygons (squares, triangles, rectangles, etc.) are **Shapes**.

Leaders placed by the *Place Multi-Line Note* tool are **Dimension** types.

Right Clicking in the Levels and Types fields Select By Attributes Dialog gives the option to *Select All, Select None or Invert Selection.*

Elements grouped together by selecting **Edit > Group** are **Cells**.

ADVANCED SELECT BY ATTRIBUTES

Overview

Up until now, we have only used the default **Mode** settings of the **Select by Attributes** tool. These are good enough to get you where you need to go 90% of the time. But there are a few things you might want to do that you'll need some extra help with. For example, you might want to:

Pick all elements except text.

Delete all color 5 lines from one part of your drawing.

Move all filled elements to level CENTERLINE.

Delete all text of font 24.

Modes

The first thing to look at is the **Modes** section of the **Select By Dialog**. There are two areas we'll focus on. The first allows you to select either **Inclusive** or **Exclusive** modes (Figure 2-44).

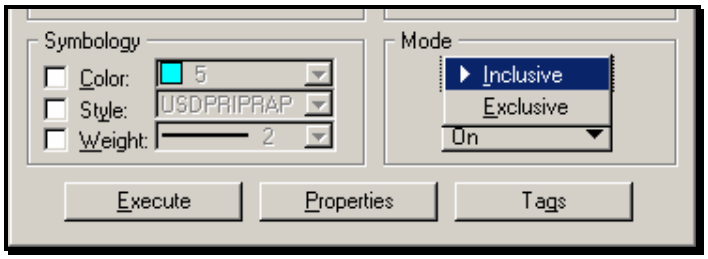


Figure 2-44: Inclusive/Exclusive

Inclusive, the default setting, means that all elements that match your criteria will be affected.

Exclusive means that all elements *except those* that mach your element criteria will be selected.

- Therefore, to pick all elements except text, set your **Type** field to **Text** and **Text Node**, set your **Mode** to **Exclusive** and push **Execute**.

The other parts of the **Mode** allow you to choose how you want to act on the elements you have selected (Figure 2-45).

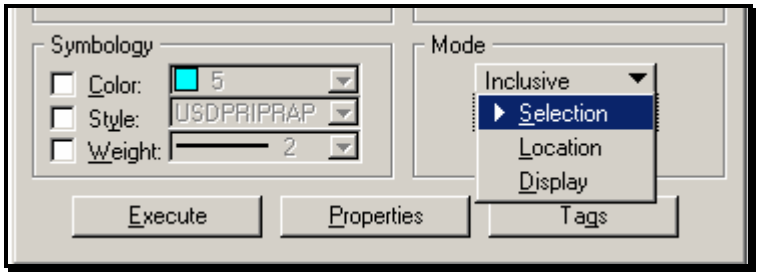


Figure 2-45: Selection/Location/Display

Selection, the default settings, adds the identified elements to a *Selection Set*.

Location allows you to "lock down" elements other than your identified elements. Only elements that match your criteria will be accessible to MicroStation commands. This will prevent you from copying, matching, or deleting any but your identified elements.

Display makes all other elements invisible. Only elements that match your criteria will show up on your window.

ⓘ ***Using the Display mode will have minor adverse effects on "dynamic" displays. This means fences, selection sets and other "rubber-banding" affects may not display as you'd expect. All the tools still work as normal, though.***

Properties

At the bottom of the **Select By Attributes Dialog** you will find the **Properties** button (Figure 2-46).

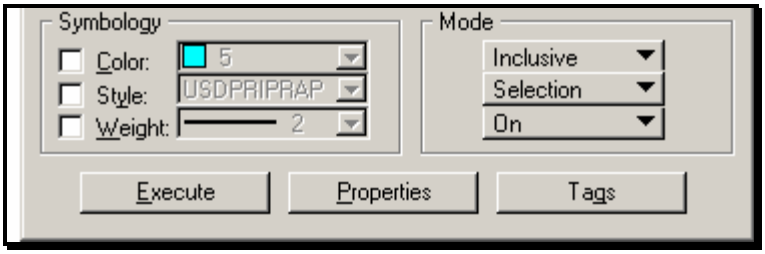


Figure 2-46: Properties

Pushing this button gives you access to more element selection criteria via the **Select By Properties Dialog** (Figure 2-47).

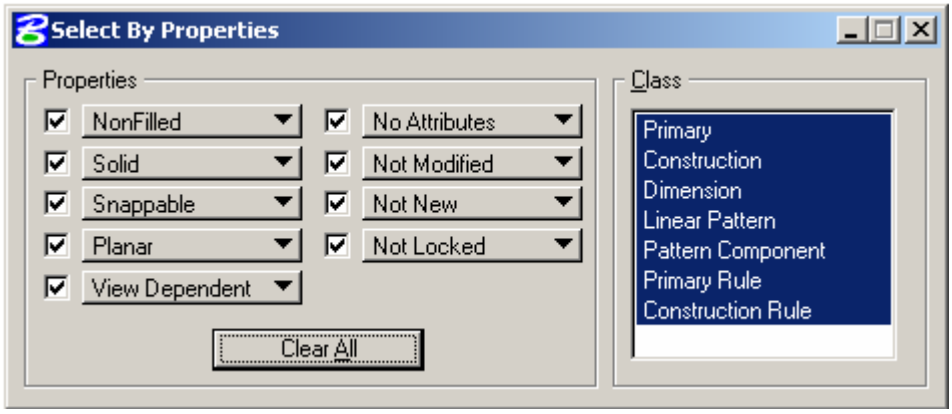


Figure 2-47: Select by Properties Dialog

Two parts of this dialog are likely to be useful to you.

From the **Properties** portion, you can place a **Check** next to the **Non-Filled** option and choose to select by whether or not an element is **Filled**.

From the **Class** area, you can select whether you want to pick **Construction** or **Dimension** elements.

- Even after you drop *Dimensions* into their component elements, those elements are still in the **Dimension Class** and can be selected together by the **Class** portion of the **Select By Properties Dialog**.

More Properties

From the **Select By Attributes Dialog**, you can open up four more dialogs that control settings for specific kinds of elements under the **Settings Menu** (Figure 2-48).

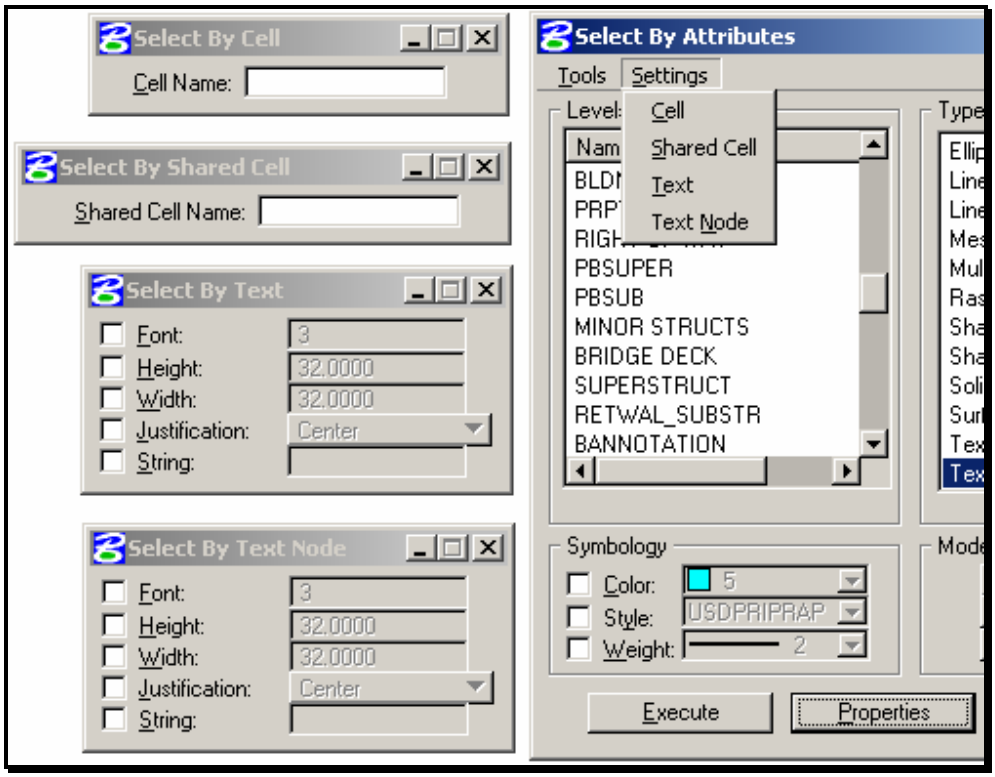


Figure 2-48: Settings Menu Properties

These options allow you to select cells and text by very specific element attributes.

Set Select By From Element

If you don't know exactly what attributes you want to select by, but you know of an element on your drawing that is an example of those criteria, you can choose **Tools > Set Select By From Element** from the **Select By Attributes Dialog Main Menu**.

This brings up the **Set Select By Dialog** (Figure 2-49).

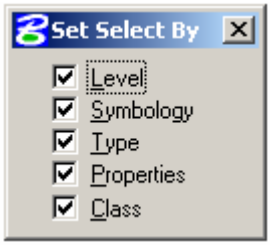


Figure 2-49: Set Select By

Toggle on or off each item on the dialog depending on whether you want to select based on that criteria, then identify the element in your file to match.

FENCES

Discussion

With all the capability of the Element Selection tools, you could ask if there is really any need for another way of grouping elements.

Fences are more of an old-fashioned way of working in MicroStation, and they are not as necessary for day-to-day drawing as they used to be.

There are, however, some important reasons to keep fences in your arsenal.

One is processing time. If you have to move a lot of elements, it is usually quicker to fence them than to select them. This is because the selection tools require more redrawing of the elements to the views.

Another reason to use fences is to clip elements by setting your *Fence Mode* to either *Clip* or *Void-Clip*.

A less common application would be to use the *Void* mode to process all elements outside the fence boundary.

Fence Types

When you choose the **Place Fence** tool (Figure 2-50) you have a number of options of what kind of *Fence* you would like to place (Figure 2-51).

Figure 2-50: Place Fence

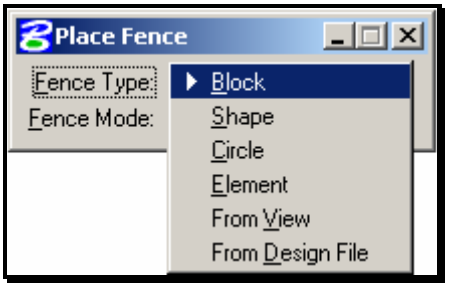


Figure 2-51: Fence Types

Block allows you to define two corner of a rectangle.

Shape allows you to define up to 101 vertices of a polygon.

Circle allows you to define a center and radius for a multi-vertex polygonal approximation of a circle.

ⓘ ***This is not really a circle, but it's pretty close. Use it accordingly.***

Element allows you to pick an element. MicroStation will approximately overlap the Element's outline with a fence.

From View will place a fence that matches the view outline.

From Design File will pick all elements in the design file.

Fence Modes

Once you have placed a fence, you can change your **Fence Mode** to affect elements that are either **Inside** or outside your fence, **Overlapping** it or not, or even **Clipping** elements at the point that the fence crosses them (Figure 2-52).

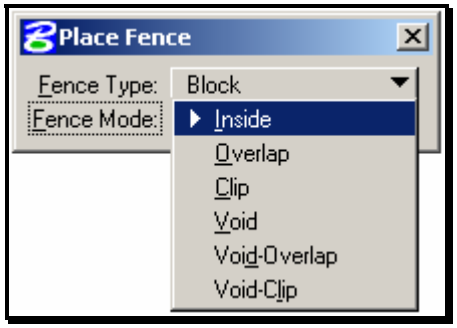


Figure 2-52: Fence Modes

Inside affects only elements entirely inside the fence.

Overlap affects elements with any part in the fence.

Clip affects all elements inside the fence, cutting elements where they cross the fence boundary.

Void affects all elements entirely outside the fence.

Void-Overlap affects all elements with any part outside the fence.

Void-Clip affects of all elements outside the fence, cutting elements where they cross the fence boundary.

Points to Ponder

Area of Influence

Selection Sets specifically identify particular elements. No matter how you process them, you never will process elements other than the ones you initially selected. This is *not* the way *Fences* work.

Fences always affect the elements that lie within their selection area (bearing in mind your active *Fence Mode*.) Every time you move or copy a fence from one location to another, you are defining a new area of influence, and can potentially be picking up new elements to process.

3D Windowing

Fences in 3D files are view-specific.

ⓘ ***Fences must be in your view at all times or they will be deactivated and you will need to place them again. Be careful when you zoom and pan.***

Deactivating Fences

The way to deactivate a fence is to choose the **Place Fence** tool. This immediately clears your active fence.

GRAPHIC GROUPS

Overview

ⓘ ***Graphic Groups are common even if you don't create them yourself: they are often the by-product of translations or custom applications. Be aware of their functionality.***

Graphic Groups are yet another way to bunch elements together for quick processing. They are more like *Selection Sets* than fences, since they single out specific elements rather than affecting all elements in a specific are the way fences do.

Graphic Groups have one special capability: elements in *Graphic Groups* can be moved independently or simultaneously depending on the current status of your *Graphic Group Lock.*

Graphic Group Lock

Graphic Groups rely on the *Graphic Group Lock*. This can be toggled on and off from the **Locks** portion of your **Status Bar** (Figure 2-53).

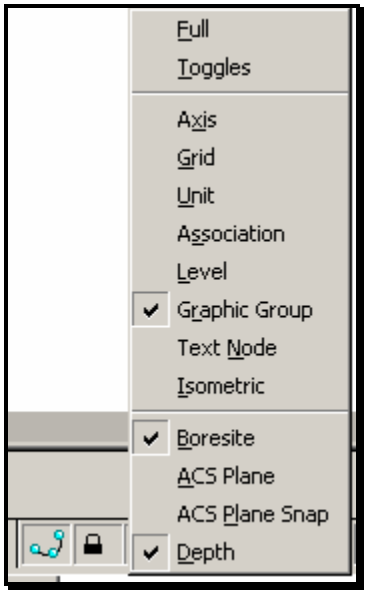


Figure 2-53: Locks in the Status Bar

When the *Graphic Group Lock* is turned on, all elements in the same *Graphic Group* are grouped together much like a single cell or *Selection Set*: they can be copied, rotated, moved or deleted as one.

However, when the *Graphic Group* lock is turned off, the elements are all affected completely independently of each other.

Adding Elements to a Graphic Group

Elements can be added to a graphic group either singly or by *Selection Set*.

To add elements one at a time, choose **Group > Groupings > Add to Graphic Group** from

your main menu, or pick the **Add to Graphic Group** tool from your **Main Tool Frame** (Figure 2-54).

Figure 2-54: Add to Graphic Group

Once the tool is activated, pick all the elements you'd like to add to the group.

To add a bunch of elements to a *Graphic Group*, add them to a *Selection Set* (by *PowerSelector*, for instance). Then choose the **Add to Graphic Group** command and *Data Point* to *Accept* the action.

Removing Elements from a Graphic Group

Graphic Groups can be dropped either singly or all at once. To drop elements from a *Graphic Group* one-at-a-time, make sure your *Graphic Group Lock* is turned off. Pick the **Drop from Graphic Group** command from your **Main Tool Frame** (Figure 2-55) or select **Group > Groupings > Drop from Graphic Group** from your menu.

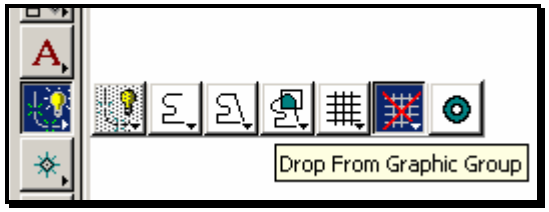


Figure 2-55: Drop from Graphic Group

Once you have chosen the tool, pick the elements you'd like to remove from the *Graphic Group*.

To drop an entire *Graphic Group*, follow the same routine as above, making sure that *Graphic Group Lock* is turned *on* instead of *off*.

Adding Elements to an Existing Graphic Group

You may want to add a couple of elements to an existing *Graphic Group*.

Choose the **Add to Graphic Group** tool. When it prompts you to "Add to Graphic Group > Identify Element" start by picking an element that is already in the *Graphic Group* you want to add to. Then go on to select the elements you would like to add to the *Graphic Group*.

ACCUDRAW

FUNDAMENTALS OF ACCUDRAW

✓ *See page 2-51for a detailed example of using AccuDraw.*

Introduction

Launch **AccuDraw** from the **Primary Tools** toolbox by pressing the **Start AccuDraw Button** (Figure 2-56).

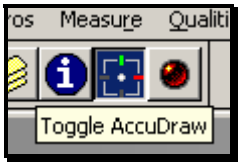


Figure 2-56: AccuDraw Start

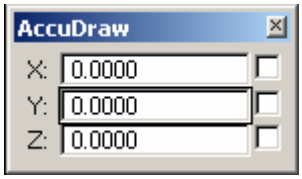


Figure 2-57: Rectangular AccuDraw Window

Somewhere on your screen you'll see the AccuDraw window (Figure 2-57).

The window may be in its *Distance/Angle* format as well (Figure 2-58).

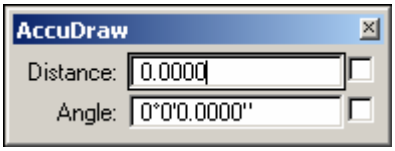


Figure 2-58: Polar AccuDraw Window

It's also possible that the AccuDraw window will be docked (Figure 2-59).

Figure 2-59: Docked AccuDraw Window

When you place a data point in the drawing, it will bring up the *AccuDraw Compass*. In Figure 2-60, you can see *AccuDraw* in *Rectangular* mode.

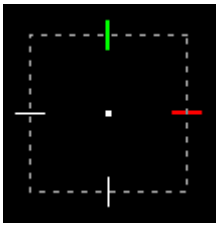


Figure 2-60: Accudraw's Rectangular Compass

- Use the *Rectangular* mode to draw xyz distances as well as slopes expressed as xy.

In Figure 2-61 you can see *AccuDraw* in its *Polar* mode.

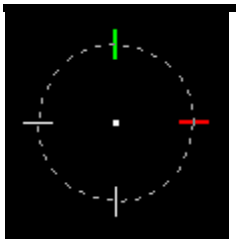


Figure 2-61: Accudraw's Polar Compass

- Use *Polar* mode to draw lines at a fixed angle or bearing.

Press your **[Spacebar]** key to toggle back and forth between distance and angle mode.

Shortcut Keys for Construction

O allows you to place the *AccuDraw Compass* at a specific point without placing a *Datapoint*.

RQ allows you to spin the *AccuDraw Compass*.

V rotates the *AccuDraw Compass* to be aligned with the view.

A locks the angle in

X, Y and **Z** lock the corresponding *AccuDraw Axis*.

[Enter] locks the *AccuDraw Axis* along whatever axis the user is gesturing.

ACCUDRAW SETTINGS

You can access *Accudraw's* settings by typing **GS** into your *AccuDraw Window* or from the *Main Menu* **Settings>AccuDraw**. This will bring up the **AccuDraw Settings Dialog** (Figure 2-62).

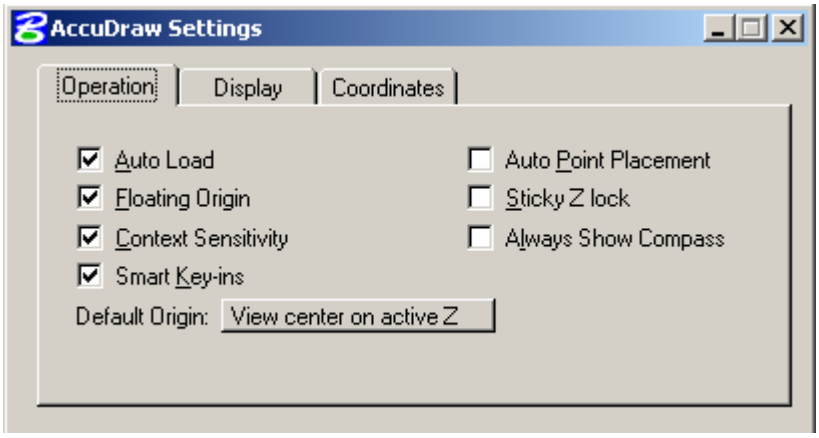


Figure 2-62: AccuDraw Settings Dialog

Operation Tab

Auto Load: If on (the default), when MicroStation is started loads AccuDraw automatically

Floating Origin: If on (the default), the origin moves to the last point placed

Context Sensitivity: If on (the default), enables tools to provide "hints" to AccuDraw to override its default behavior for smoother operation

- **Context Sensitivity** won't do anything without **Floating Origin** turned on.

Smart Key-ins: If on (the default), AccuDraw interprets a number as positive or negative, depending on the direction of the pointer from the compass. In rectangular mode only, causes AccuDraw to move the focus to either the x or the y field depending on pointer position.

Auto Point Placement: When on, places data points automatically when they have been fully constrained (default is off)

Sticky Z Lock: If on (default is off), when you lock the Z axis, for example, where you want to draw on the one plane (that is, you want to lock Z=0), while snapping to elements that are on another plane the Z value will remain locked until you turn it off.

Always Show Compass: If on (default is off), when is activate AccuDraw, the compass displays before placing a data point for the current operation.

Default Origin: Lets you choose the default origin. When a tool starts AccuDraw and there is no origin currently defined, then this setting specifies the default location of the AccuDraw drawing plane origin. Options are:

View Center on active Z: The AccuDraw's origin is centered in the view, at the Active Z depth

Global origin: The AccuDraw's origin at the Global Origin of the file

Global origin on active Z: The AccuDraw's origin at the Global Origin of the file and at the Active Z depth]

Display Tab

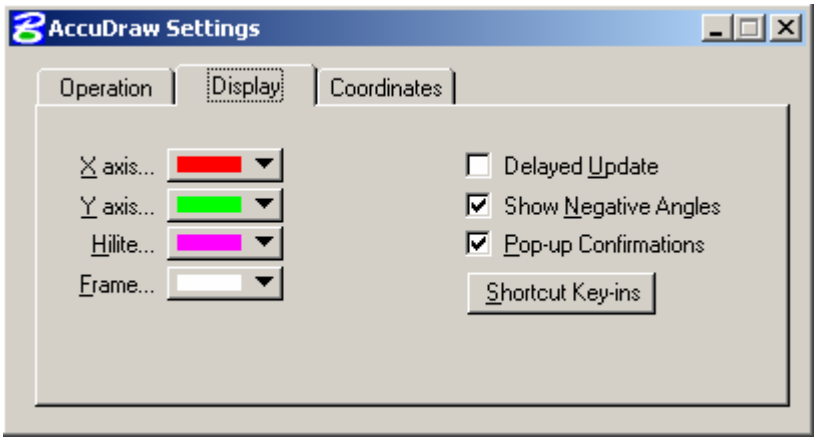


Figure 2-63: AccuDraw Settings Display Tab Dialog

X axis, Y axis, Hilite & Frame: The colors on the AccuDraw compass, via an option menu can be changes for the X axis, Y axis, negative X and Y axis and compass frame

Delayed Update: If on (default is off), the coordinates are updated in the AccuDraw window when pointer is at rest. If off the coordinates are continuously updated, as the pointer move.

Show Negative Angles: If on (default), AccuDraw displays negative angles (+/-180°)

Pop-up Confirmation: If on (default), AccuDraw displays shortcut popups.

Shortcut Key-ins: Opens dialog that lists AccuDraw shortcut keys.

Coordinates Tab

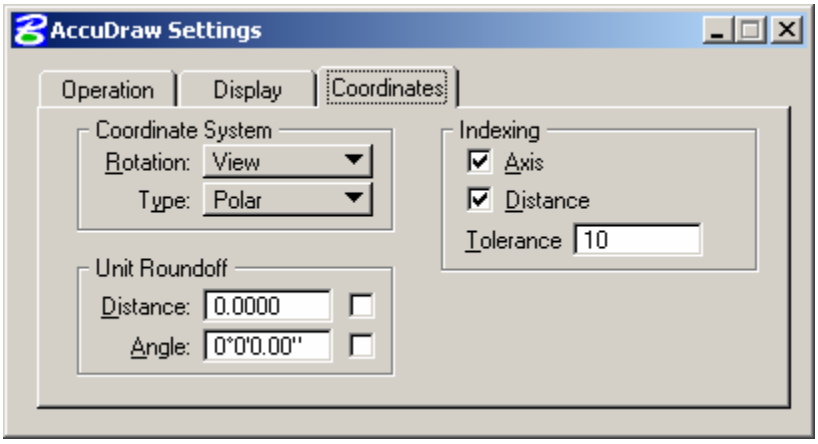


Figure 2-64: AccuDraw Settings Coordinates Dialog

Rotation: The AccuDraw compass can be rotated: Top, Front, Side, View, Auxiliary and Complex. Context lasts only for the current drawing tool

Type: Sets AccuDraw Compass to Rectangular or Polar

Unit Roundoff: This works like a grid, that helps place "freehand" drawings to a specific **Distance** and **Angle**.

Indexing: The **Distance** required to move the pointer from the indexed **Axis** is controlled by the **Tolerance** setting.

- Tolerance is measured in screen pixels, 1-99 allowed

ACCUDRAW SHORTCUT COMMANDS

AccuDraw shortcut commands are invoked by typing either the single letter or combination of two letters as outlined in the **AccuDraw Shortcuts** dialog (Figure 2-65).

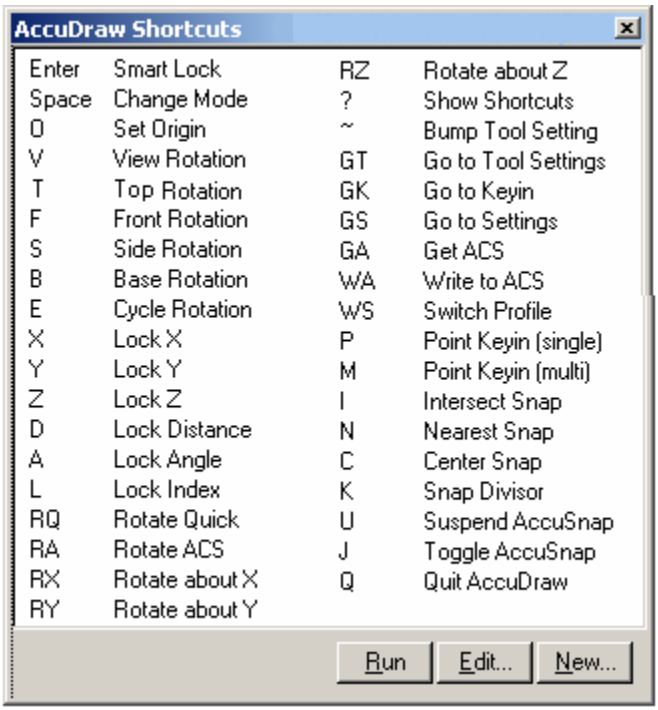


Figure 2-65: AccuDraw Shortcuts Dialog

- Note that these shortcuts will only run if *AccuDraw* has *focus.* For a complete list of shortcuts, type (Shift+?).

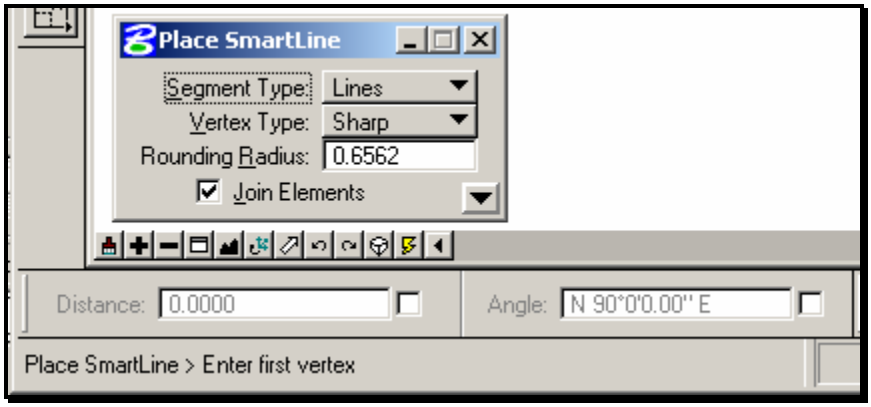


*Figure 2-66: AccudrawDocked - Focus **OFF***

Note also that the *Tool Settings Window* has *Focus* (like the **Place SmartLine** window in Figure 2-66) and *AccuDraw* is grayed. The **Esc** key toggles focus back and forth between *AccuDraw* and the *Tool Settings Window*. If I were to hit the **Esc** key (located in the upper left of my keyboard), the Focus will change to the AccuDraw (Figure 2-67) and the Place SmartLine window is grayed.

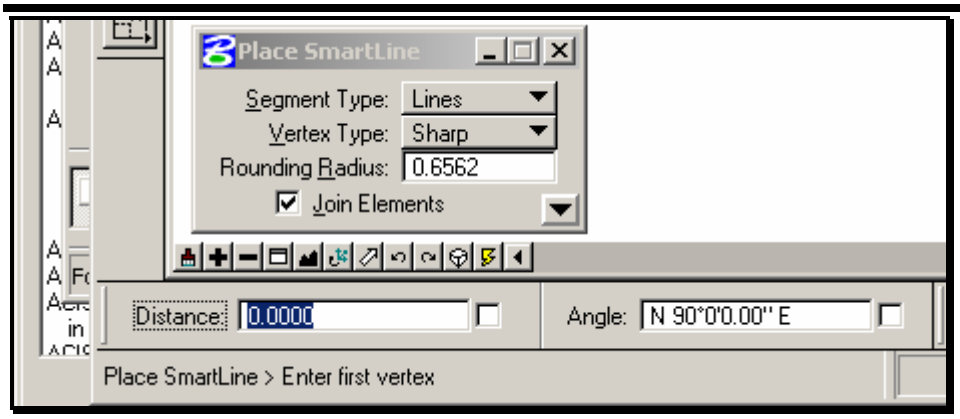


*Figure 2-67: AccuDraw Docked - Focus **ON***

Some Important Shortcut Keys

Try to get used to using the **K**, **N**, **C**, **O** and **I** shortcuts to activate your *Keypoint*, *Nearest*, *Center Origin* and *Intersection* snap modes.

ACCUDRAW EXAMPLE: ROADWAY TEMPLATES

Calculating Slope

AccuDraw can be used to calculate your cross slopes easily. The basic theory is to figure the "drop" for the distance and slope of your lane. Mathematically, to know how far a 3.3 m lane will "drop" at a -2% slope, you would multiply 3.3 * .02. This results in a .066 m drop. *AccuDraw* can do this for you in one easy step.

First select the **SmartLine** and place the first point.

Move your cursor in the X direction so that *AccuDraw* sets its *focus* in the X field. Input your lane width 3.3 meters as a horizontal distance (Figure 2-68).

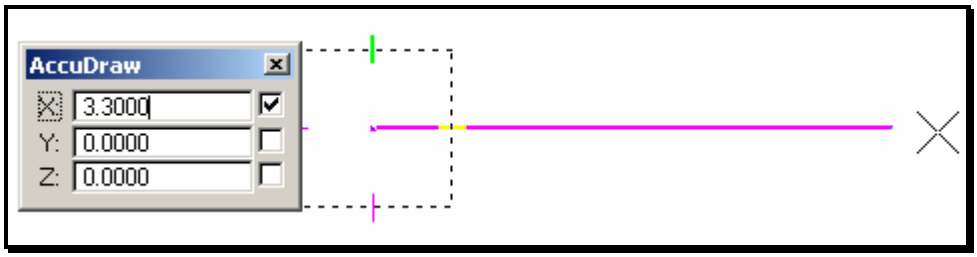


Figure 2-68: Enter Width in AccuDraw

Move the cursor in the Y direction, shifting the "focus" of the *AccuDraw* window accordingly. (For a negative slope move the cursor down or up for a positive slope.)

Enter the horizontal distance again, 3.3m. Then, using **[SHIFT 8**], evoke the multiplication function of *AccuDraw* and enter .02. By entering your slope in decimal form, you will be multiplying the lane width by the slope to calculating the drop (Figure 2-69).

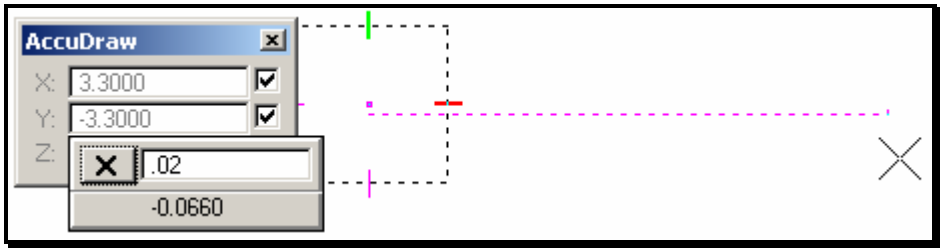


Figure 2-69: Calculate Vertical Drop Based on Slope

By accepting this position, you have just placed a line that extends the width of your lane and drops according to your decimal slope. If you then hit the "V" on your keyboard, the *AccuDraw* compass will rotate parallel to the view and you can continue placing a shoulder without quitting the SmartLine command.

Placing Accudraw's Origin

You can change the origin of your line and make it relative to a position on the screen. This comes in handy when drawing typicals from scratch. For instance, if you drew the finished

grade using the distance/slope method described earlier, you could use the Origin function of *AccuDraw* to lay your pavement lines.

First, *snap* to the place that you want to move your origin from.

In this example, you would start with the smart line command and then snap on the centerline position of the finished grade (Figure 2-70).

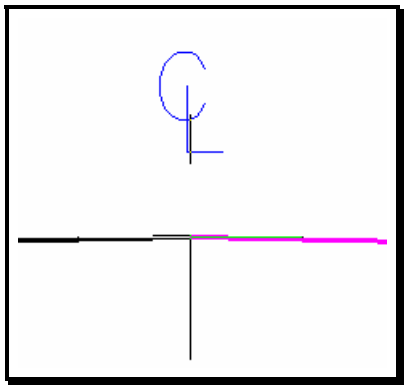


Figure 2-70: Tentative on the Centerline

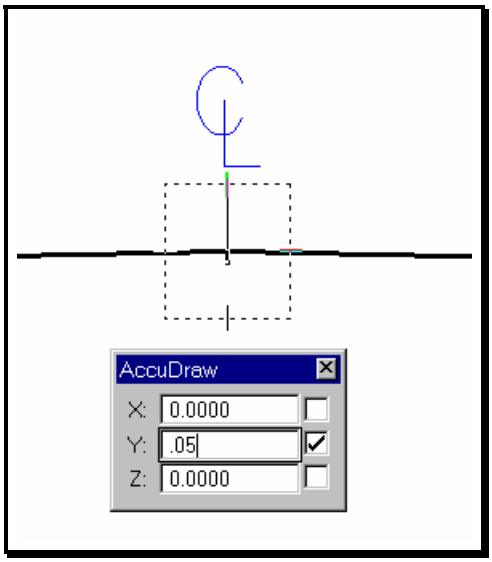


Figure 2-71: AccuDraw Origin

Without accepting that position, hit the "O" on your keyboard to invoke the **Set Origin** function of *AccuDraw* (Figure 2-71).

This will allow you to move your cursor without actually drawing a line. If you move your cursor in the Y direction, you can then input the exact distance you want to move away from your snap point and begin drawing. So if you wanted to move down 50 mm and start drawing again, you would move your cursor down and then type in .05. By accepting that position with a *data point* you can begin to draw again (Figure 2-72).

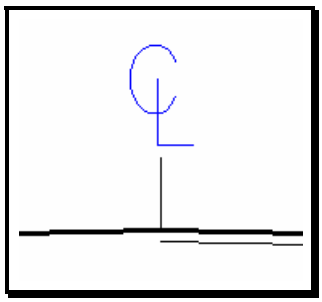


Figure 2-72: Free to Draw

Likewise, you can use multiple Origins to move first in one direction, and then another. With this functionality, you will hardly ever have to use construction lines. The *AccuDraw* Origin will allow you to move around and position your cursor almost anywhere in relation to other elements in your design file.

DRAWING IN SUB-UNITS

Sometimes, it is easier to draw in sub-units. With the introduction of the metric system, the conversion to master units is made quite easy.

1000 mm = 1m

500 mm = 0.5m

30 mm = 0.03m

…and so on and so on. But still, there will be times when you will want to draw in sub units, especially for U. S. Customary jobs.

This is done easily and simply with *AccuDraw*. All you need to do is choose your starting point for your line and then input the distances using a colon or semicolon (: or ;) before the numbers (Figure 2-73).

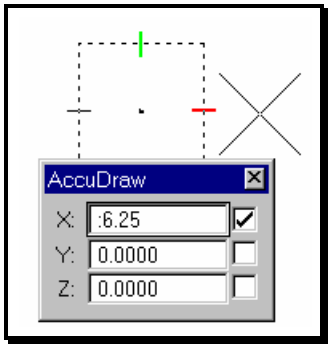


Figure 2-73: Subunits in AccuDraw

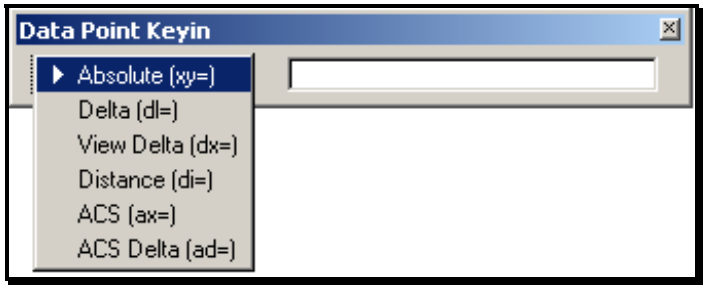
This tells *AccuDraw* that you will be using the sub-units. For instance, if you were working in an U. S. Custom job (ft, in) and wanted to draw a line that is 6.25 inches long; all you would have to do is input that distance in your *AccuDraw* window with **:6.25** (Using the proper X,Y, Z depending on what direction you want to move in).

DRAWING BY COORDINATES

Using the Data Point Keyin

Sometime you may want to draw a line, place a cell or other type of element at certain coordinates in a drawing. Some files are at their intended State Plane Coordinate System (i.e. topo, contours, highway, bridge, alignment, etc.) and others are not dependent on the coordinate system (i.e. 3 digit prefix plan sheets and z files).

Start a command that will utilize a point placement method (i.e. *Place Line, Place Active Cell, etc).* When ready to enter a coordinate position, verify that you have focus in *AccuDraw* and type **"P"** to activate the *Data Point Keyin* dialog.



Select *Absolute (xy=)* from the pull down. Enter the coordinates points for the X, Y and Z values separating them by commas. If you need the dialog for multiple points, type **"MI"** for multiple keyin points.

✓ *Please refer to MicroStation's HELP menu for more information about the different methods of the Data Point Keyin.*

Locking AccuDraws Compass at 0,0

By default, your AccuDraw compass is setup to reside at the the last point that is selected in a file by clicking a data point. If a line is drawn, the *AccuDraw* compass is at the end of the line, rotated along the line so that a user can draw easily draw a perpendicular line from the last point or an arc that is tangent to the line just drawn.

At times you may want to set *AccuDraw* at 0,0 so that the lines, arcs, cells or text placement can be relative to 0,0 in your file. You can adjust your *AccuDraw* settings so that the compass is loced at 0,0 and doesn't follow (Float) or move to the last data point or to the end of a line. To lock your *AccuDraw* compass at (0,0) in your drawing, goto **Settings>AccuDraw** and while displaying the *Operation* tab, uncheck *Floating Origin.* Now goto **Utilities>Keyin** and type in **AccuDraw Setorigin 0,0,0.** This keyin can be added to a *Function Key* for quick activation. Sometimes you may want to temporarily move your origin to the end of a line so that you can draw lines based on an angle or bearing. You can still move this origin by using the *AccuDraw* shortcut key "o" (origin) and the "RQ" (rotate quick) functionality or "T" (top rotation) to rotate the compass to a top view (+Y = north). Reset your origin to 0,0 in the file by typing the keyin again.

✓ *Refer to previous pages in this chapter for more information about AccuDraws shortcut keys, setting its origin and floating origin.*

MEASURING

COORDINATE READOUT

Control the display of your working units from your main menu by selecting **Settings** > **Design File**>**Coordinate Readout** (Figure 2-74).

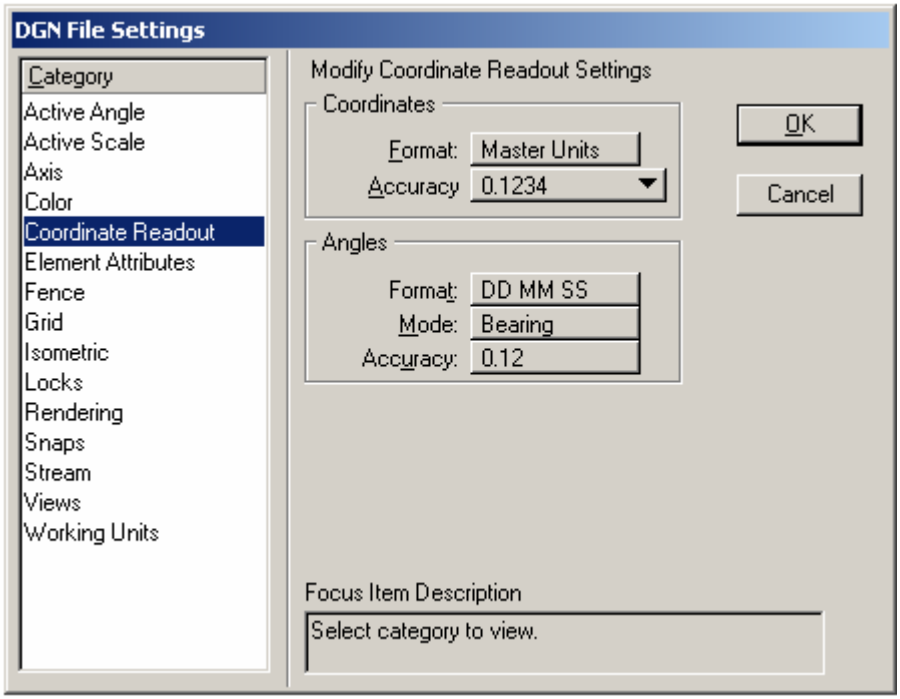


Figure 2-74: Design File Coordinate Readout

This area is going to control how MicroStation displays linear and angular measurements to you.

Linear Units, Accuracy

In the **Coordinates** area of this dialog, choose **Format** (Figure 2-75) and **Accuracy** (Figure 2-22).

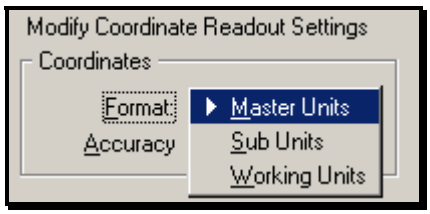


Figure 2-75: Coordinate Format

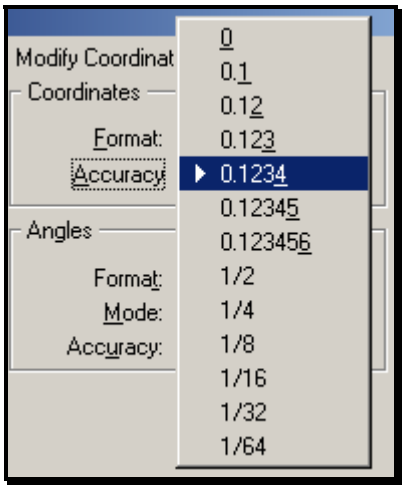


Figure 2-76: Coordinate Accuracy

The **Format** should be set to **Master Units** for working in metric drawings.

- The only time you would set **Format** to other than **Master Units** would be for U S Custom work. You might set it to **Sub Units** to display Imperial projects in feet and inches (whereas keeping it set to **Master Units** in Imperial will display data in decimal feet.)

Set your Accuracy to reflect how many decimal places you want your measurements displayed to.

Angle Accuracy and Mode

From the **Angles** portion of the **Design File Settings Dialog** you can control the **Format** (Figure 2-77), **Mode** (Figure 2-78), and **Accuracy** (Figure 2-79) of MicroStation's angular display.

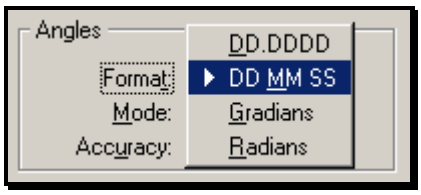


Figure 2-77: Angle Format

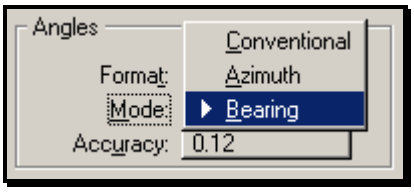


Figure 2-78: Angle Mode

Choose whether you want the **Format** of your angular display to be in decimal degrees or in degrees, minutes and seconds.

Choose whether you want your **Mode** to be **Conventional, Azimuth,** or **Bearing**. **Conventional** angles start with 0° at 3:00 (on a clock) and increasing counter-clockwise (90° would be 12:00). **Azimuth** angles start with 0° at 12:00, increasing clockwise (90° would be at 3:00). **Bearing** angles are expressed in terms of North/South X° East/West.

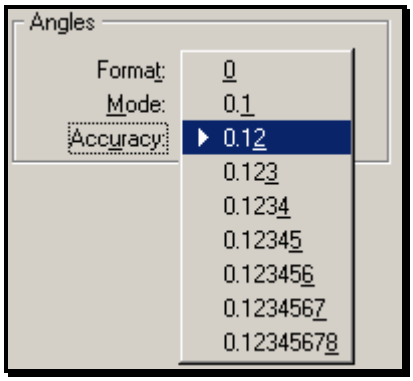


Figure 2-79:Angle Accuracy

Set your angular accuracy to as many decimal places as you want.

- Note that if your **Format** is **DD MM SS**, then your **Accuracy** is the number of decimal *Seconds* you want displayed.

MEASURING PART 1

You can access all measuring commands from your main menu by selecting **Measure** (Figure 2-80).

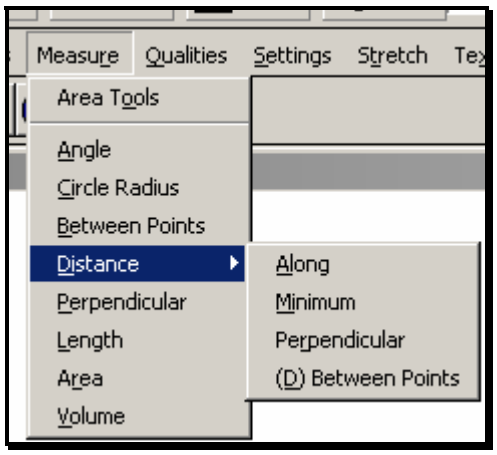


Figure 2-80: Measure Menu

Circle Radius, **Length**, **Area**, and **Volume** require that you simply identify one element.

- **Circle Radius** can be used to measure the radius of arcs and ellipses as well.

Angle and **Distance > Minimum** require that you identify two elements.

ⓘ ***Perpendicular measuring sometimes gives unexpected results in 3D files. If you encounter this, flatten your file and try again or try the Measure Distance Between Points command while using AccuDraw to get the Perpendicular distance.***

MEASURING PART 2

Measuring Areas

With a basic understanding of *Region Creation*, measuring areas becomes straightforward.

From your **Main Tool Frame**, select **Measure Area** (Figure 2-81) or choose **Measure > Area** from the main menu.

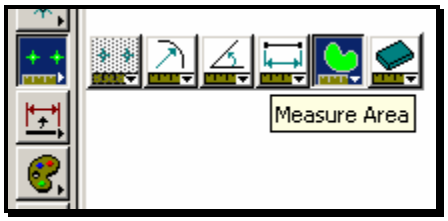


Figure 2-81:Measure Area

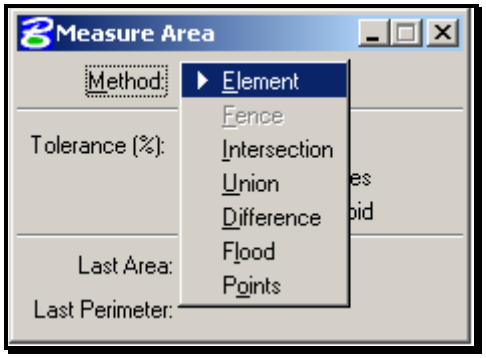


Figure 2-82:Measure Area Methods

A brief look in the **Tool Settings Window** should reveal some familiar **Methods** (Figure 2-82).

Element: measures the area of a single closed element

Fence: measures the area of a fenced area.

Intersection: measures the area where two or more closed elements overlap.

Union: measures the total area encompassed by two or more closed elements.

Difference: measures the area of a single closed element with "bites" taken out by other closed elements.

Flood: finds an enclosing region around a *data point*.

Points: measures the area of a polygon entered by the user.

Look at **Measure > Area Tools** for measuring and labeling areas in one fell swoop.

MEASURING AREAS AND PLACING TEXT

Step One: Lock "Z" to Zero

From the *Main Menu* select **Macros>Set/Lock Z** to force MicroStation to place all elements at "0.00" elevation in the file. Click **OK** for the defaulted "0".

- This will prevent MicroStation from jumping to elements at different depths in the file.

Step Two: Set the Category Scale

Right Click on your *Settings Manager* and select **Category>Scale.** From the list of available scales, select the scale that you intend on plotting your sheets.

- If you use the *Settings Manager* for almost any activity, it is required that you set the **Category Scale** first. This has to be set once in every file.

Step Three: Set the Text Attributes

Using the *Settings Manager,* select **Prop. Text and Dims>Text Note or Standard Text (Normal).** This will set your text to the correct height, width, color, level, style and weight.

Step Four: Open Measure Area Tools

Select **Measure>Area Tools** from the *Main Menu.* A new set of tools should open.

In the rightmost tool in the *Tool Box* (Figure 11-12), set some *Parameter Settings*.

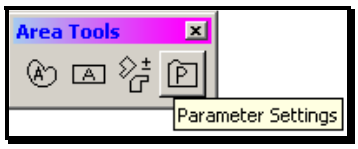


Figure 2-83: Area Parameter Settings

Part One: Set the Default Text Font

While in the **Text** tab, set the **Font** to **123 dotitalics** (Figure 11-13). This is the only setting necessary on the tab.

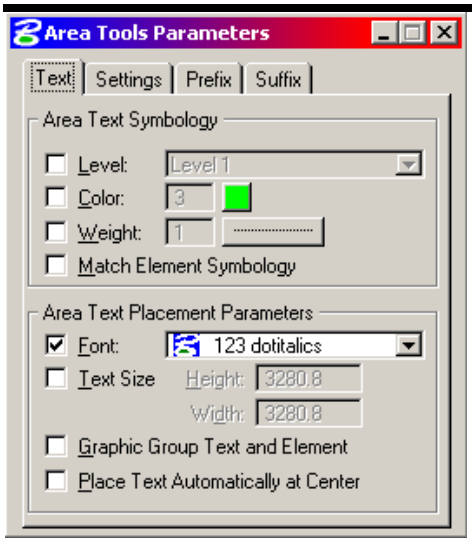


Figure 2-84: Adjust Text Font to 123 dotitalics

Part Two: Set the Default Prefix

Click on the *Prefix* tab (Figure 11-14). Add a prefix that you would like to use. (i.e. Wetlands =). You're limited to ten characters.

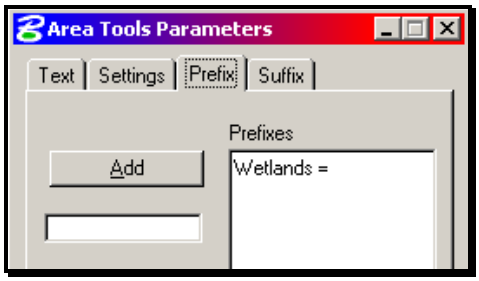


Figure 2-85: Add a prefix

Part Three: Set the Default Suffix

Click on the *Suffix* tab (Figure 11-15). Add a suffix that you would like to use. (i.e. s.f. or m\178 for metric). You're limited to ten characters.

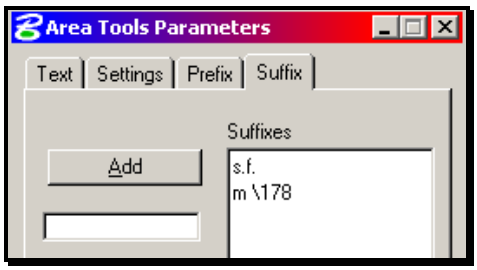


Figure 2-86: Add Suffixes

Step Five: Select Measure Area Tool

From the *Area Tools* toolbox (Figure 11-16), select *Measure Area.*

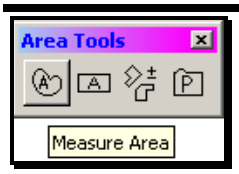


Figure 2-87: Measure Area Tool

Configure area tool for the method, prefix and suffix. Select one of the methods available. If using the *Flood* method, use the PowerSelector and select all bounding elements. If there is a gap in any of the connections, correct it or use the *Flood* method in the *Measure* Toolbox as it allows the jumping of gaps. Click inside the area or on the element (based on the method you picked).

This should label your area. The orientation of the text will be horizontal to your current view window which means you will have to rotate and possibly move text. Use the **Rotate Element** tool and set method to either **2 points** or **3 points.** Follow the prompts.

ⓘ ***If you cannot see the text for your areas, check that you have done all the steps in this section.***

Step Six: Select None

Select **Edit>Select None** to unselect any elements that may be currently selected.

TIPS AND TRICKS

We have a number of tools and tips to make the measurement of areas easier.

Measuring with Flood Method

PowerSelector

If you are working in a crowded area, you will have a hard time using the *Flood* method to pick exactly the area you want to measure. This is because *Flood* is confused by lots of crossing lines. To simplify matters, start by using the *PowerSelector* to pick only the elements that make up the outline you want to measure. Now use *Flood* and data point somewhere in this area. *Flood* will look only for highlighted elements when it looks for an enclosing *region*.

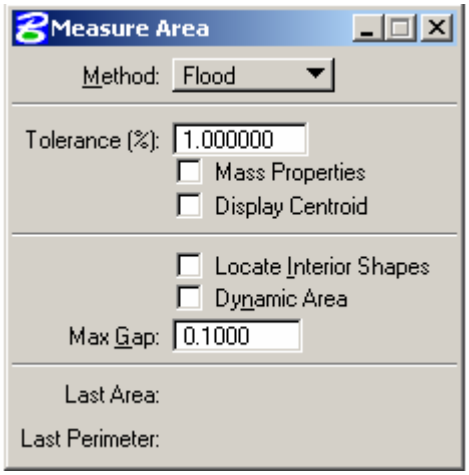


Figure 2-88: Measure Area by Flood Options

Adjust Max Gap

If MicroStation can't find an enclosing *region*, you may have some slight gaps between elements. Try changing your **Max Gap** value to a higher number (Figure 2-88). If you have to set it higher than .1, you may need to make sure that your file is flat and that you have selected all of the elements that make up your boundary.

✓ *Check Flattening your Active File on page 2-87.*

Set/Lock Z to Zero

Another macro that will help make sure that you are measuring on the same plane and get the correct area measurement is called ZLOCKANY. This macro is kicked off by selecting *Macros>Set/Lock Z* from the *Main Menu* and setting the active depth to "0" in the 3D file.

Converting Metric Measurements to English

We have a macro that will convert your metric measurements directly into English units.

All you have to do is measure your area in Metric, then run the **acre.bas** macro. ROW users

press **Alt+F2** or **Utilities>Macro>MicroStation BASIC>acre**. This will bring up the **Area** dialog (Figure 2-89).

Figure 2-89: Area Macro Options

Press the unit that you want to label and the macro will stick text right on your pointer. Make sure to have your text height and font (229 verdana) set up right beforehand.

- If you find, in the middle of the macro, that your text height is wrong, just **Reset** and pick the right text height. Then re-run the macro. You do not have to re-measure the area. MicroStation remembers the last area that you measured.

REFERENCE FILES

REFERENCES DIALOG

Select: **File > Reference (DOT)>Dialog**. This will open the **Reference Dialog** (Figure 2-90).

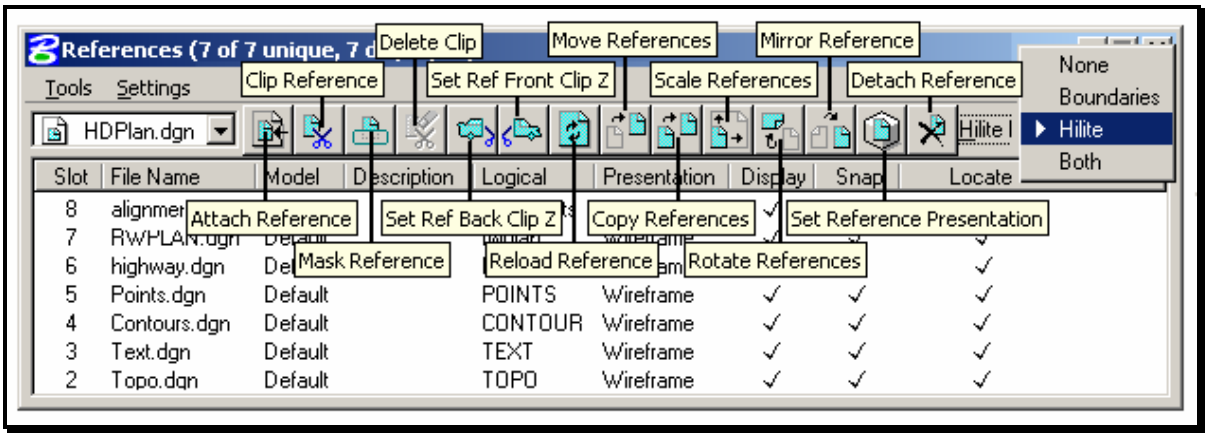


Figure 2-90:Reference Dialog

List box

Slot: The a number of a File referenced

File Name: The name of the DGN being attached

Model: The name of the Model that contains the elements diaplayed

Description: A description of the file reference

Logical: A name assign to the file being referenced

Presentation: The Display Mode of the graphics

Display: By clicking the checkmark turns the graphics in the file **On** or **Off**

Snap: When checked **On** snapping to an element is possible

Locate: When ckecked **On** allows elements to be copied into the *Active File*

You must first select a reference file in the *List Box* before you can change a setting or select a tool. However, you can change the Display, Snap, and Locate settings for DGN files simply by clicking in that column.

Icons

Attach Reference: Used to attach a reference to the active file

Clip Reference: Used to display only graphic inside a fence boundary

Delete Clip: Deletes the clip boundary of a reference

Set Ref Back Clip Z: Sets the back clipping plane for a 3D reference

Set Ref Front Clip Z: Sets the front clipping plane for a 3D reference

Reload Reference: Reloads all references, allowing you to see changes made since being loaded

Move Reference: Moves a reference

Copy Reference: Copies a reference

Scale Reference: Scales a reference

Rotate Reference: Rotates a reference

Mirror Reference: Mirrors a reference

Set Reference Presentation: Changes the display: Wireframe, wiremesh, etc.

Detaches Reference: Detaches a reference

Hilite Mode

Highlighted and/or surrounded a reference by a border when placed in the active file.

None: Does not place a dashed border or highlight the select reference.

Boundaries: Places a dashed border around the select reference.

Hilite: Highlights the selected reference.

Both: Places a dashed border and highlights the selected reference.

Main Menu (Tools)

Attach: Used to attach a reference to the active file

Attach URL: Opens the Select Remote Design File to Attach dialog box, which is used to attach a remote referenced model

Detach: Detaches a selected reference

Detach All: Detaches all references

Reload: Reloads a references, allowing you to see changes made since being loaded

Reload All: Reloads all references

Ref Agent: Opens the Reference File Agent dialog box, which enables you to automatically maintain local copies of remote references

Exchange: Toggles from the master file to an attached reference

Move: Moves a reference

Copy: Copies a reference

Scale: Scales a reference

Rotate: Rotates a reference

Merge Into Master: Merges reference models to the active file.

Make Direct Attachment: Promotes the nested attachment to a direct attachment so it can be modified. The nested attachment becomes redundant with the newly created direct attachment. Quotation marks under Display, Snap, and Locate indicate a redundant attachment.

Mirror Horizontal: Mirrors a reference about the horizontal axis.

Mirror Vertical: Mirrors a reference about the vertical axis.

Clip Boundary: Used to display only graphic inside a fence boundary

Clip Mask: Masks a part of a reference that is inside a fence boundary

Delete Clip: Deletes the clip boundary of a reference

Clip Front: Sets the front clipping plane for a 3D reference

Clip Back: Sets the back clipping plane for a 3D reference

Main Menu (Settings)

Settings: Opens the an *Attachment Settings Dialog* that is used to set attachment information for references

Presentations: Opens the *Set Presentation Dialog* used to set presentation for references

Update Sequence: Opens the *Update Sequence Dialog* used to change the order of display for references

Adjust Colors: Opens the *Adjust Reference Color Dialog* used to modify or change colors of references

REFERENCES ATTACH

Most of the file will already be attached. From time to time files will need to be attached. To attach a reference from the same PIN without *Browsing*: **File**>**Reference (DOT)>Attach**. This will open up the **Attach Reference** dialog (Figure 2-91). This is an automated routine to look at where you entered MicroStation thru the projects list and place you into the proper directory tree.

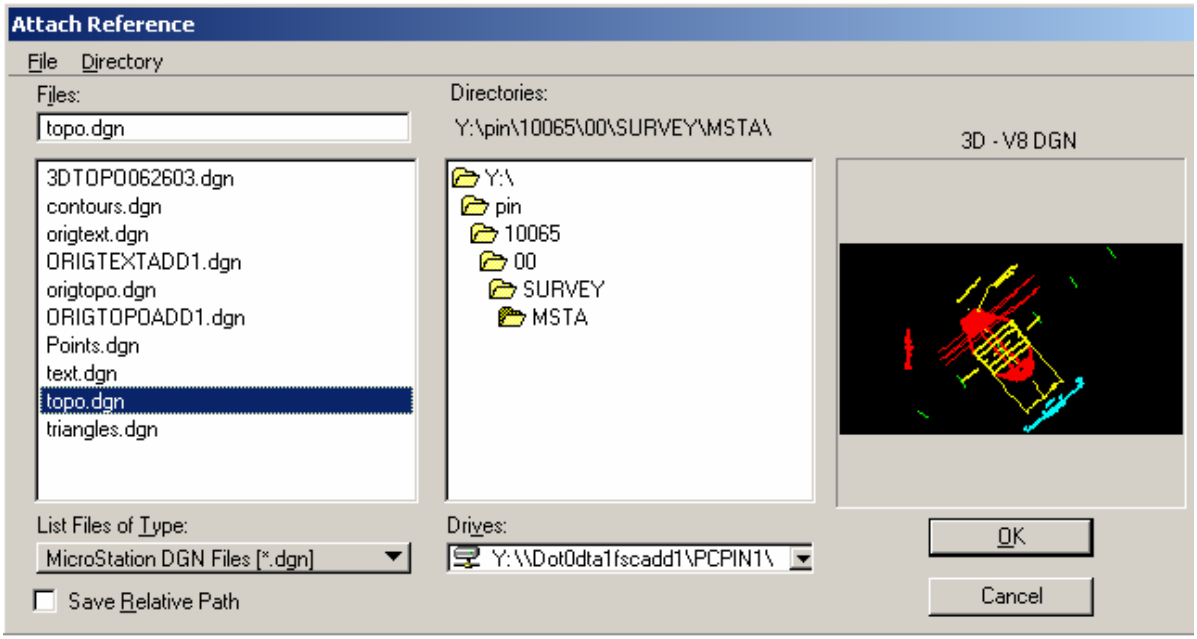


Figure 2-91: Attach Reference

Browse to the SURVEY\MSTA directory and select the file and **Click OK**. If *File>Reference (DOT)>Attach* is not used be sure that you are browsing in the proper directory because MicroStation remembers the last place you went to attach a reference file.

This brings up the **Attach Reference Settings** Dialog (Figure 2-92).

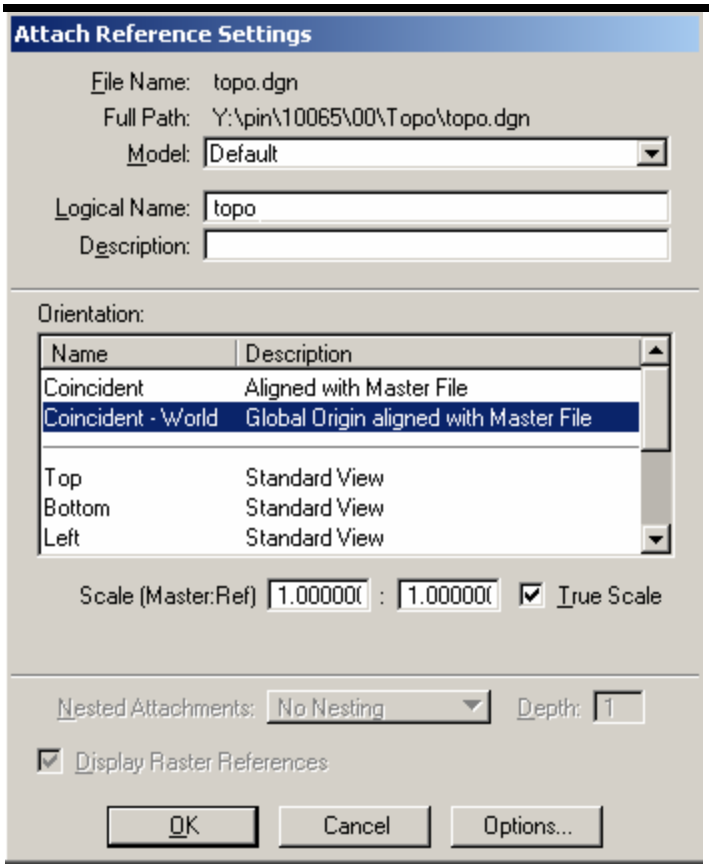


Figure 2-92: Attach Reference Settings Dialog

For now work is done in the **Default Model**. Type in a **Logical Name** (topo), select Orientation (Coincidental-World Global Origin align with Master File), **Scale (Master:Ref) 1:1** and **True Scale Checked**. Push the **OK** button. Push **Fit View** (on the lower left of the window border) to see all your reference files. **Nested Attachments** (Figure 2-93) will be grayed if no files are attached to the file being referenced.

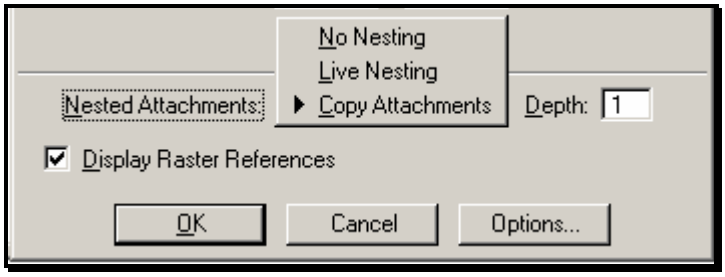


Figure 2-93: Nested Attachments

Nested Attachments

Nesting describes how nesting of references is handled.

No Nesting: References attached to the file being referenced will not be displayed

Live Nesting and **Copy Attachments**: References attached to the file being referenced will be displayed and appear in the list of reference

Depth

0: References only the file being attached

1: References the file and any files being reference to it

2: References the file, any files being reference to it and references any files attatched to those and so on

For example, *Live Nesting*: File B is attached to file A. Further, file B also has file C attached. If you detach file C from B, file C will no longer appear as attached to file A.

Where *Copy Attachments*: File A has an attachment, file B which also has an attachment, file C, if file C is detached from B, file C will still appear as attached to A unless C has been explicitly removed.

Display Raster References

When a rastered image is attached to a file a **Checkmark** can be placed in the box with a data click to display the image. If there is no image attached to the file the area on the Attach Reference Settings Dialog will be grayed.

REFERENCE FILE MOVING

Everyone likes to have some control on how the plan appearance looks. You have the ability to move your reference files around in your border.

Select: **File > Reference** to open the **References Dialog** box (Figure 2-94).

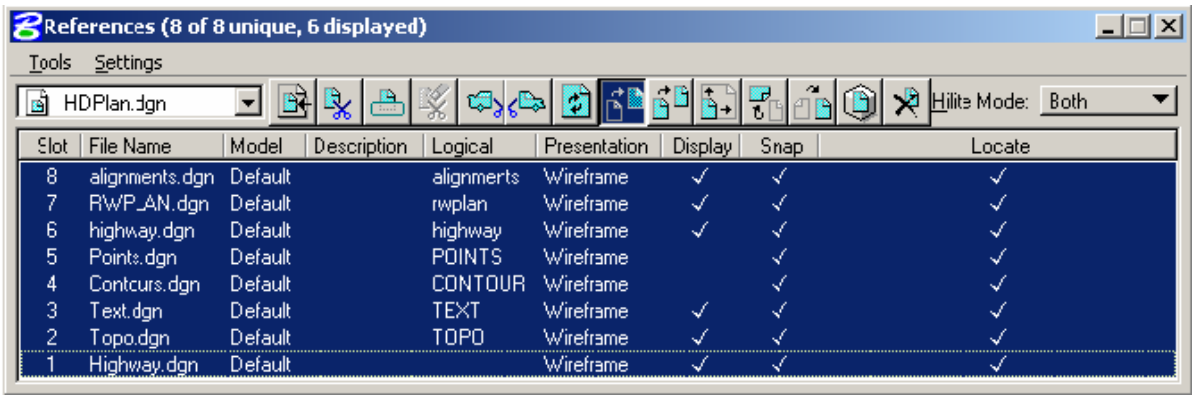


Figure 2-94: Reference Dialog

Highlight the reference file or files that you want to move. From the **Reference Dialog** box, select **Tools>Move**.

MicroStation will prompt you (in your **Status Bar**) to "Move Reference File > Enter Point to move from." Enter a data point. MicroStation will now prompt you to "Move Reference File > Enter point to move to." Enter another data point. MicroStation will move all the reference files you selected from the first point to the second point.

REFERENCE FILE ROTATION

MicroStation 3D files allow for reference file rotation in the **X, Y,** and **Z-axis**. When working in a plan view, reference file attachments will only need to be rotated around the **Z-axis**.

Select: **File > Reference**. This will open the **References Dialog** box (Figure 2-95).

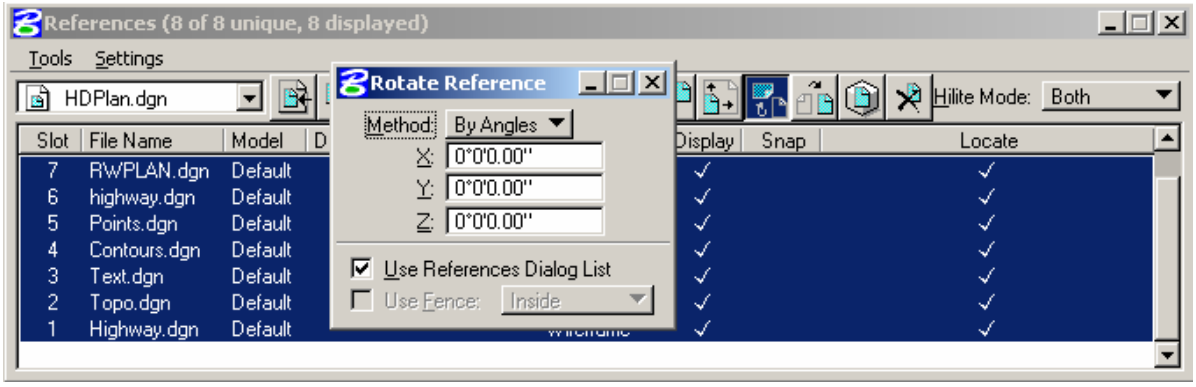


Figure 2-95: Reference Dialog

Let's begin by selecting the file or files you want to rotate. From the **Reference Files** dialog, select **Tools>Rotate**. This will open up the **Rotate Reference File Dialog**. Set the angle to rotate around the **Z-axis** and send a data point to your screen. After rotating you may want to move the reference files to a more precise location on your border.

✓ *Refer to Reference File Moving, page2-73.*

RASTER FILES

ATTACHING A RASTER IMAGE TO SCALE

Determine Image Size

Before the image is placed in MicroStation, create a rectangle the same dimensions as the 1:1 paper image multiplied by the original scale of the image. Doing this will insure that the Image will be to scale. To do this, open *Windows Explorer* and browse to the image. Next, **Rt+click** the image and select **Properties.** Select the *Summary* tab and click the *Advanced* button. You should see the width and height in pixels and the horiz. and vert. resolution (should be the same) (Figure 2-96).

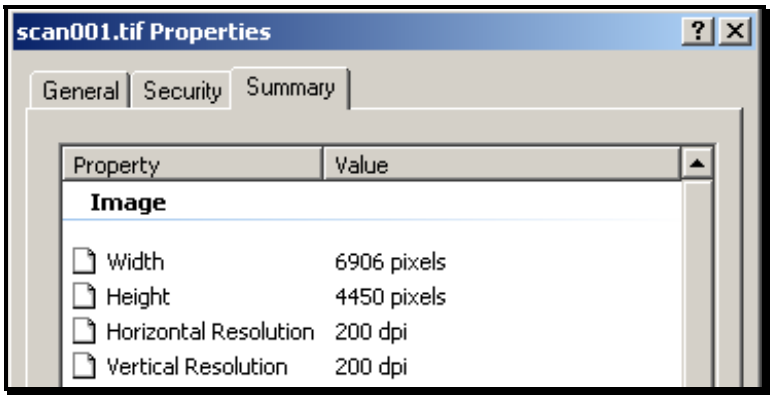


Figure 2-96: Windows Explorer

Divide the dimensions by the resolution to get the image size in inches. Using the numbers in the expamle above (Figure 2-96), divide 6906 by 200 & 4450 by 200 to get the width and height in inches (34.53 x 22.25). Now we have to multiply these dimensions by the original scale of the image. If the scale is 1"=25', the dimensions, both width and height, will need to be multiplied by the absolute scale which is 300 (12"x25'). You can calculate these dimensions now or use *AccuDraw's* built in calculator to calculate the dimensions on the fly. In this example, the retangle will have to be 10,359' x 6,675' to be 1:1 (actual size) in MicroStation (i.e. 34.53 x 300 = 10,359' & 22.25 x 300 = 6,675').

- If the image will open with *Paint*, check **Image>Attributes** for size in inches.
- The TDS860 is in the Reproduction Room which scans images at 300 dpi's (dots per inch).

Place Block

Start MicroStation, select the **Place Block** and place the first point. Move your cursor in the X direction so that *AccuDraw* sets its *focus* in the X field. Input colon **:34.53** (subunits) using **[SHIFT 8**], evoke the multiplication function and enter **300** for the horizontal distance. Move the cursor down in the Y direction, shifting the "focus" of the *AccuDraw* window accordingly. Enter the horizontal distance **:22.25 * 300** for the Vertical distance and enter a data point to finish the rectangle.

Attach Raster Image

To attach a *Raster Image*, select **File**>**Raster Manager**. This will open up the **Raster Manager Dialog** (Figure 2-97).

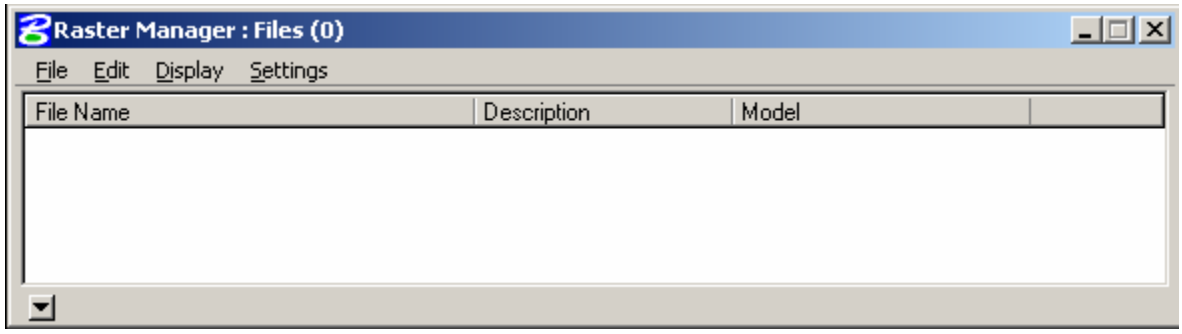


Figure 2-97: Raster Manager Dialog

From the main menu of the *Raster Manager Dialog* select **File>Attach**. When the **Attach Raster Reference Dialog** (Figure 2-96) opens browse to select the Image File and hit **OK**.

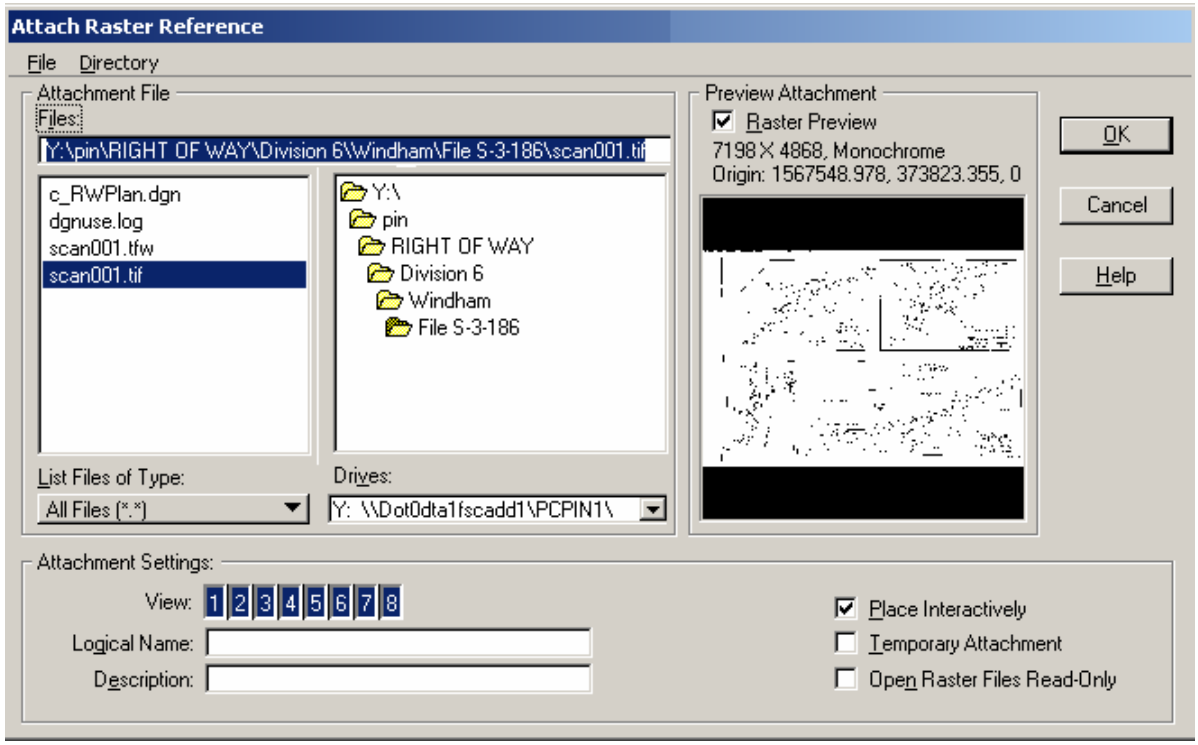


Figure 2-98: Attach Raster Reference

MicroStation will ask for **Enter Origin**, see *Status Bar*. Place a *Data Point* at the upper left corner of the rectangle previously created for the **Enter Origin** point. Next place a Data Point, in the lower right corner of the rectangle to enter the **Enter Corner** point. The scale of the image can be changed by **Scaling** the rectangle and detaching and reattaching the image: **File> Detach** and **File> Attach**.

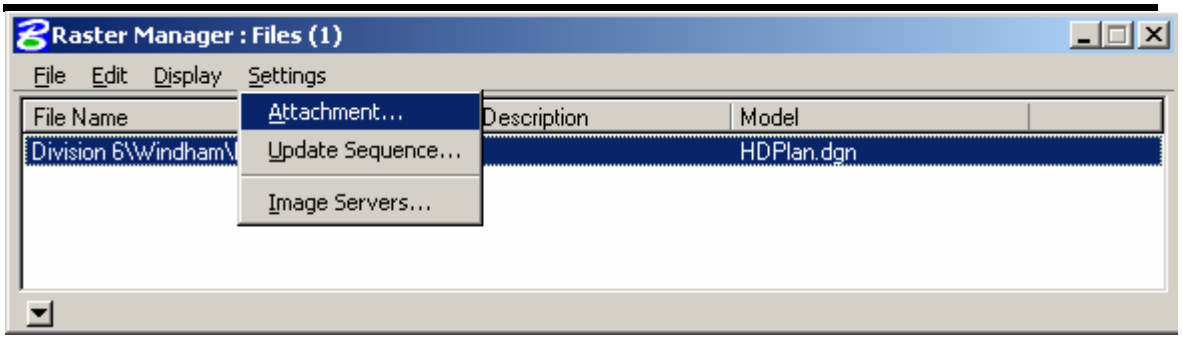


Figure 2-99:Raster Manager Attachment

In the *Raster Manager* (Figure 2-99) from the **Settings** submenu select **Attachment…**. To print the image white with black details the color may need to be changed. Open the **Color** tab (Figure 2-100) and check for a white **Foreground** and a black **Background**.

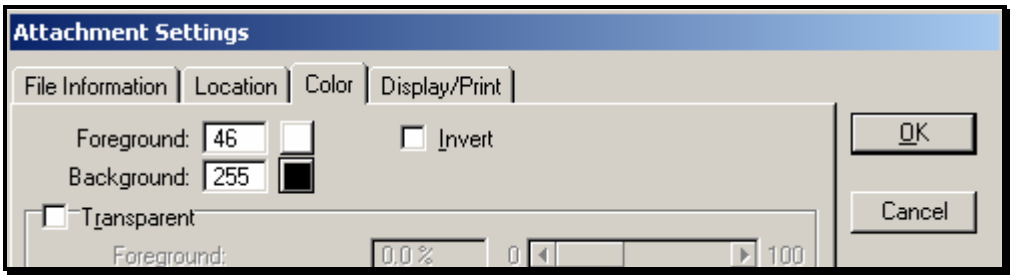


Figure 2-100: Attachment Settings

GEOREFERENCED IMAGES

Overview

MicroStation has the ability to attach Raster Images that have spatial extents. This means that the image has a "world" or a "sister" file that contains the X and Y coordinates of where the image should sit on the face of the earth. Because of many different potential coordinate systems, it is very important that you know what coordinate system your project is based on.

Browse to your projects directory on the Y: drive (\\dot0dta1fscadd1\pcpin1). Your project's Survey\MX folder contains a **Status.doc** or **Status.rpt** file. The **Status** file indicates what the units are for your project and the coordinate system used. Any images will have to be "projected" to this same coordinate system for the MicroStation graphic and the image to line up.

Preferences

Some of the "out of the box" preference will need to be adjusted also for the image to display properly and in the correct location. Go to **Workspace>Preferences…** and select *Raster Manager* from the *Category* list (Figure 2-101). Adjust your settings to look like the settings in the dialog box. This will allow images to be placed in your drawing based on its *World File* or *Sister File.* The units may have to be adjusted base on the the image units.

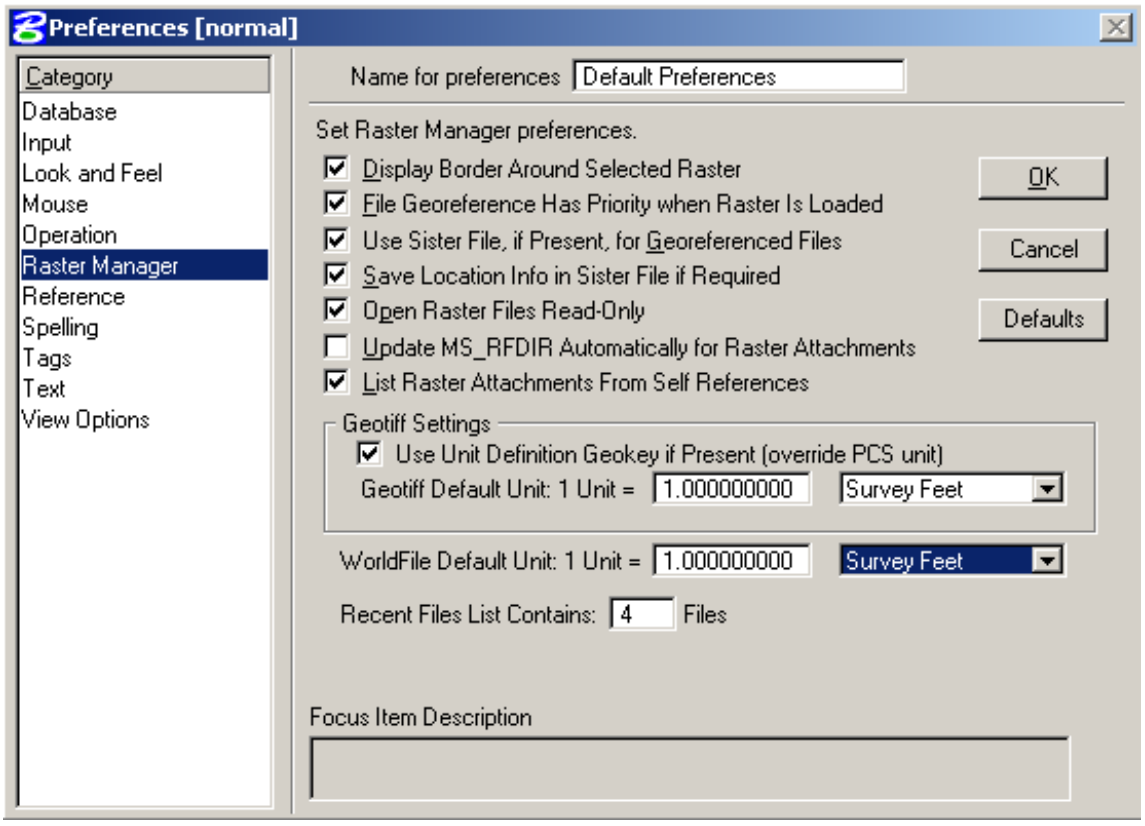


Figure 2-101 User Preference dialog – Raster Manager Preferences

MACROS

PLOTTING BY STATION AND OFFSET

Plotting elements along a centerline is fairly simple when your on a straight portion of the alignment. *AccuDraw* performs this task very easily. Drawing a perpendicular line off a centerline on a radius is fairly easy, however plotting a point or placing a cell at a specific "odd" station along the curved alignment is a cumbersome task. We have created a macro that make this easy… once you get the hang of it. The *Pointalong* macro is going to make it possible for us to construct points at a specific distance along an existing alignment. From these points, we'll be able to draw a line perpendicular to the alignment at a specific distance.

Starting Point

Run the *Pointalong* macro by selecting **Graduate>Distance and Offset** from the most *Settings Managers* (ROW workgroup users have global *Function Key* menus in which by selecting the **F12** key will start the macro). You will be prompted to "Identify Point to Construct Distance From." (Figure 9-1)

Figure 2-102: StartPoint Along Status Prompts

The Macro is expecting a data point on your "alignment." Using the *Keypoint* snap, *Intersection* snap or *AccuSnap,* snap to the middle of a station tick mark. Once this point is selected, either the tick mark or the centerline may be highlighted. You want the centerline highlighted. Right-click until it is highlighted and click your left mouse button to *Accept*.

Entering the Distance and Direction

Once you've entered a data point telling the macro the start point, it will prompt you to "Enter Distance Along Element." (Figure 9-2)

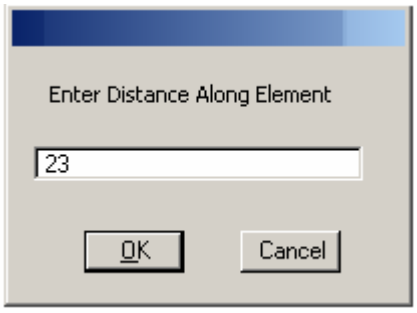


Figure 2-103: Input Distance

If you were trying to construct Station 1+35.240 from a tick mark at Station 1+20.000, the distance to construct would be 15.240. Enter in your desired value and press the **OK** button.

Choosing the Direction

This next step is very important. The macro isn't smart enough to know whether or not you want to construct a point to the left or to the right of the point that you just chose. Look down in your *Status Bar* to see that the macro is now prompting you to "Identify Direction for Construction." (Figure 9-3)

Figure 2-104: Status Bar Message

What it is asking for is a data point either to the left or to the right, or, in the case of a vertical line, above or below the first point you entered. Put your cursor on the baseline near the first point, but clearly to one side or the other (Figure 9-4) and enter in a data point (left button). There is no need to snap to enter this point.

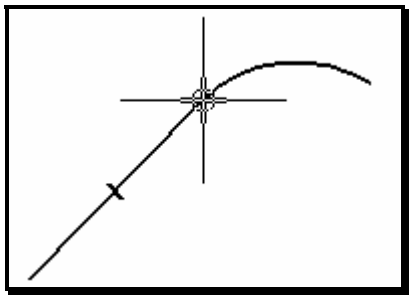


Figure 2-105: Identify Direction for Construction

When you enter a data point, MicroStation will start drawing a line at the specified offset and direction from the first point you entered (Figure 9-5).

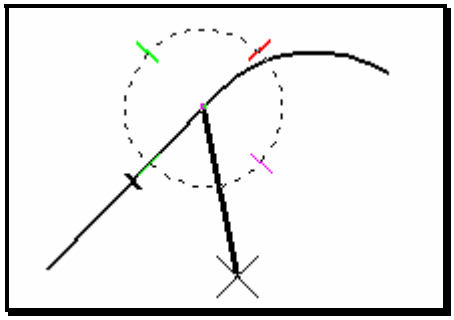


Figure 2-106: Point Constructed

It will also put the **AccuDraw** compass on the line, rotated to make it easy for you to construct a line perpendicular to your centerline.

Choosing the Offset Distance

Now that we are drawing a line, we can choose to go either to the right or to the left of the centerline. Just put your cursor graphically near where you want the line to go. Keep your cursor near the axes of **AccuDraw** and it will ensure that you are drawing perpendicular to the baseline.

Enter your Offset into the **Distance** field of your **AccuDraw** window (Figure 9-6).

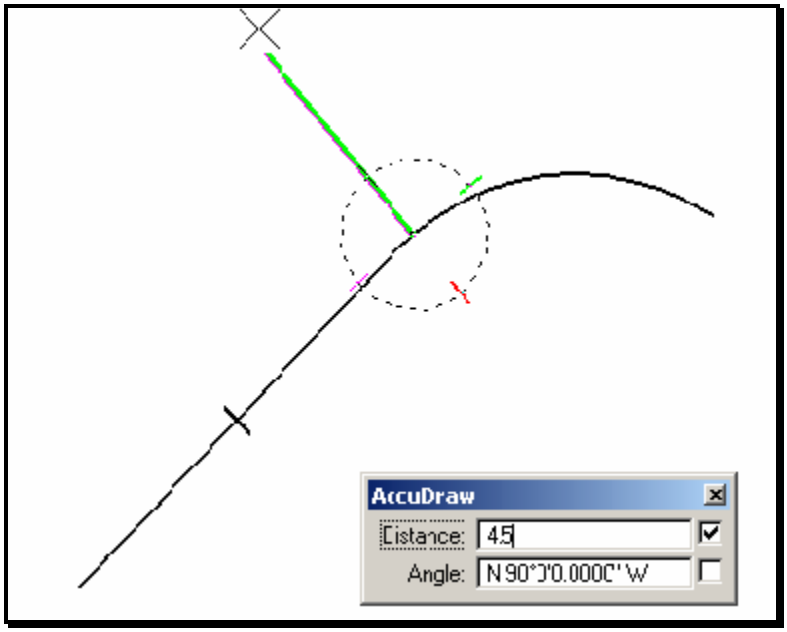


Figure 2-107: Constructing a Distance off the Baseline

Notice that the angle is 90°. Enter a *Data Point* to complete the command. *Reset* to stop drawing lines.

Troubleshooting

There is a **Warning Dialog** (Figure 9-7) that you will get from time to time when you construct distances using this macro.

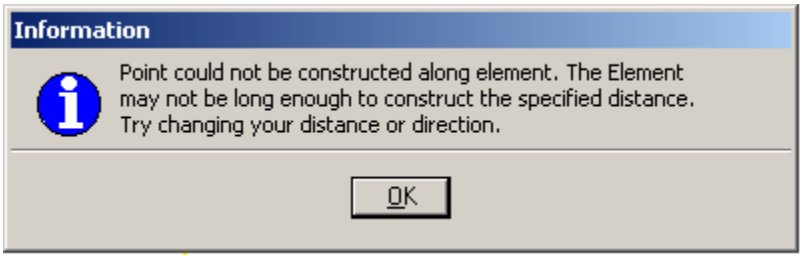


Figure 2-108: Pointalong Warning Dialog

It lets you know that the point you are trying to construct cannot be constructed because your Element is too short. This could happen for a couple of reasons.

1) You may have just chosen the wrong direction to construct from. Your baseline may run 16 kilometers to the right and only 16 centimeters to the left of your offset point. You can't construct a point 10 meters to the left of that first point.

2) You may have picked the wrong element to construct the distance along (i.e. tick mark). Choose the point again and make sure that you *Accept* only the element you want to construct along.

3) You may have used the *Drop Element* tool to drop *Complex Status* of the baseline. This would have broken up the lines and arcs that are joined together in a "complex chain" of

a baseline, leaving only individual lines and arcs. The resulting elements are much shorter than a typical baseline.

You can put dropped baselines back together using the *Create Complex Chain* tool. Set your method in the *Tool Settings Window* to **Automatic.**

✓ *Refer to 2-12 for using the Complex Chain Tool*

4) You may be confusing Metric and English units. Make sure you're not trying to go 75 feet along a 40-meter line. MicroStation reads that "75" distance as 75 meters if you're working in a metric drawing.

HOTSWAP

Overview

This macro helps you navigate to specific elements in reference files.

Launch the Macro

From the main menu, select **File > Reference (DOT) > HotSwap**.

Identify the Element

MicroStation will prompt “Hotswap > Identify Element.” Chick on the element with a *Datapoint*.

- MicroStation will not allow you to identify Dimensions to swap to the reference file. Pick a line, arc, circle, text, or some other basic element type.

ⓘ ***MicroStation will also not allow you to identify elements in your active file.***

Once you have picked an element, MicroStation will hilite the element and prompt you “Hotswap > Follow Element? (Accept/Reject).” *Datapoint* to *Accept* and MicroStation will open up the file of the indicated element.

Set Zoom Level

Once MicroStation has opened the target file, it will center your view window on the indicated element and open the **HotSwap Zoom Dialog** (Figure 2-109).

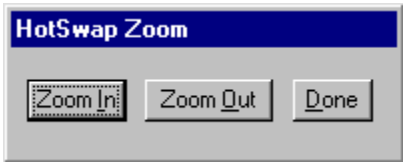


Figure 2-109:HotSwap Zoom Dialog

This dialog allows you to **Zoom In** or **Zoom Out** centered on the indicated element.

Press the **Done** button when you are finished zooming.

Tips

The easiest way to get back to your previous file is from your **File** menu.

At the bottom of the menu, right below **Protection** there should be a list of files. File number 1 is your active file. File number 2 is your previous file.

Open your previous file from the main menu by choosing **File > 2 [Filename…]** form the list of files.

LABEL SLOPE BY POINTS

Overview

This macro was created to make it easier to label roadway lines with the appropriate slope value.

Setup

Set your text up to the proper style and scale by using your *Settings Manager*.

✓ *Refer to page 2-20 for more information on the Settings Manager.*

Run the Macro

From your Settings Manager, choose **Prop. Text and Dims > Slope %.** MicroStation will prompt you in the status bar "SlopeByPoints > Enter First Point." *Snap* and *Accept* to a point on the slope you wish to define.

MicroStation will prompt you in the status bar "SlopeByPoints > Enter Second Point." *Snap* and *Accept* to another point on the slope you wish to define.

You will get a positive slope if your first point is below your second point. You will get a negative slope if your first point is above your second point.

- For roadway slopes, snap to an inner point before an outer point.

Once you have defined your points, MicroStation will bring up the text dialog with your slope all typed in.

- You can edit the text at this point, if you desire. You could change the sign, degrees of accuracy, etc.

MicroStation will prompt you to "Place Text Above Element > Identify Element."

Datapoint on the line you want to label, near the point you would like the text to be. The text will appear, highlighted, above the element you selected. *Datapoint* to *Accept*, or *Reset* to choose another point for text placement.

FLATTENING YOUR ACTIVE FILE

Flatten.bas is a BASIC macro that was designed to help you squash a 3D file down to a single elevation. It's like pressing a leaf in a book: it takes all of the peaks and valleys and presses them down.

When to Flatten

There are a couple of symptoms that may occur in your file to lead you to believe that you have a 3D problem. If you measure the distance between two points and find that it is much greater than you were expecting, perhaps those points are at different elevations. If you measure the length of a short line and find that it is hundreds of meters long, the line may be spanning two elevations.

How to Flatten

From the Main Menu, select **Macros > Flatten**. This will open the **Flatten File** dialog (Figure 2-110). Type in a target elevation for your elements and press **OK**.

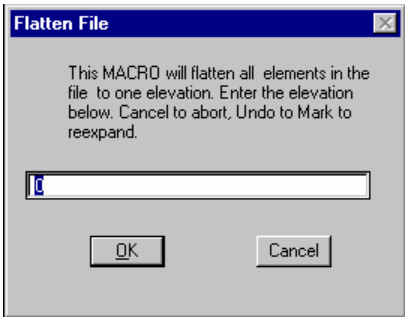


Figure 2-110: Flatten File Elevation

The Status Bar will prompt you to "Flatten Elements? (Accept in Plan View/Reject)". Enter a *Data Point* in your plan view.

How to Undo The Flatten

If you change your mind about flat elements, you are going to have to take a special course to undo what you have done: namely, go to the Main Menu and choose **Edit > Undo Other > To Mark**.

- This is necessary because the Macro issues the scale command about ten times. If you were to undo singly, it would only undo one of those scales. The Macro sets a **Mark** in the file before it starts to scale though, so you can undo all of its impact in one fell swoop.

Other Options When Flattening

If you don't want to scale all the elements in your file, the Macro will allow you to scale only the contents of a Selection Set or a Fence. Pick a bunch of elements with the Element Selection Tool or the *Powerselector* or place a Fence before you run the Macro. The Macro will then only impact the elements you have selected.

Just What Exactly Does the Flatten Macro Do?

Flatten.bas starts by checking to see if you have an active Fence or Selection Set. If you don't, it executes the "Select All" command, picking all elements in the file. Then it prompts you to enter in an elevation for elements to be scaled to. Then it runs the "Scale" command, setting your active (xyz) scale to (1,1,0.00001). This scales in the xy direction by 1 (no change) and the z scale by 0 (flattening the elements.)

Next, the Macro turns off *AccuDraw* (because the scale command tries to read *Accudraw*'s orientation, which could really screw up the automation.) Now the Macro gets a *Data Point* and changes the z-value of that point to equal the z-value entered by the user. The Macro then briefly turns off the display of elements to the screen (this saves processing time.) Next, the Macro runs the scale command ten times (just once doesn't seem to do it.)

Finally, the Macro turns element display back on (you shouldn't even notice a difference) and activates *AccuDraw*. Even if you didn't have it on before, you'll have it on afterwards.

STEEL MACRO

Overview

The **Steel** macro draws standard steel shapes for the user. Selection is made in a graphic dialog box based on shape type. The user has the option of placing shapes by any of nine points of origin, i.e. top left, bottom right, etc.

Step Zero: Preparation for the Macro

This macro is not going to set any appropriate level, color, style or weight. Before you launch the macro, use your *Settings Manager* and pick the most appropriate setting (i.e. **Structural Detailing > Superstructure**.)

Step One: Launch the Macro

Launch the macro from the main menu by selecting **Macros > Steel**. This will bring up the **Steel Selector Dialog** (Figure 2-111).

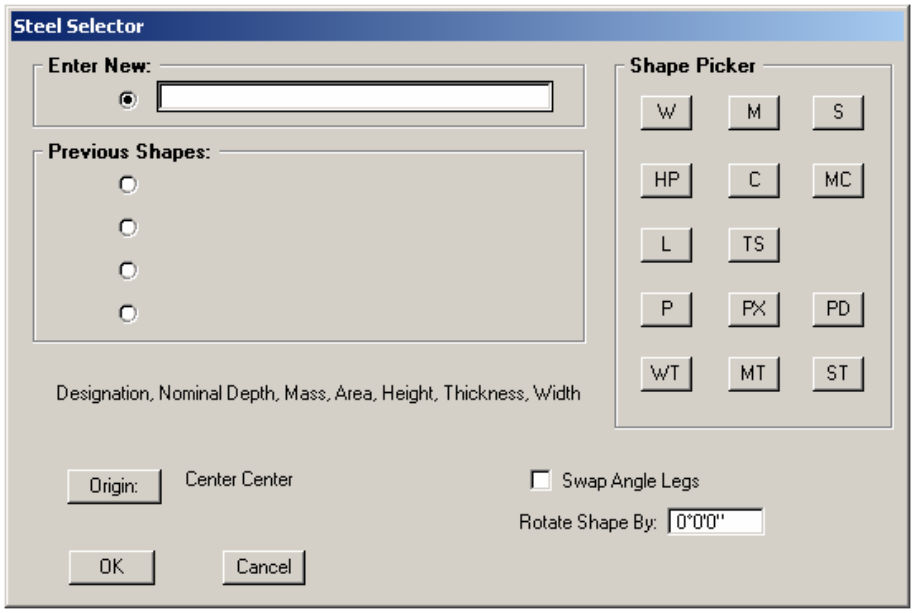


Figure 2-111: Steel Selector Dialog

Step Two: Pick Your Shape

On the right side of the **Steel Selector Dialog**, notice the section labeled **Shape Picker**. Each button in this area is labeled with a type of steel shape: **W, M, S,** etc. Find the steel type you want to place and click the button.

This will bring up the **Shape Picker Dialog** (Figure 2-112).

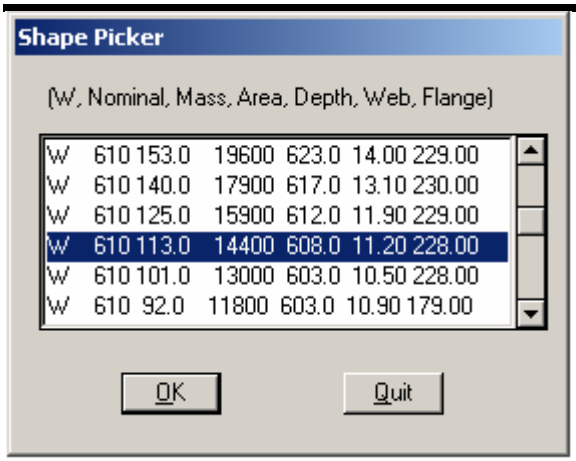


Figure 2-112: Shape Picker Dialog

This dialog is a scrolling list of all the available shapes of the type you selected. Scroll down the list until you find the shape you want to place, and then press **OK**.

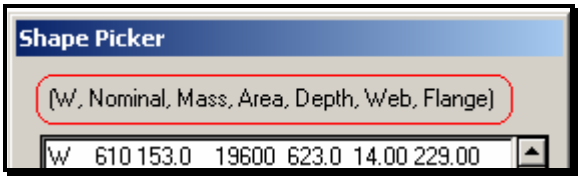


Figure 2-113: Steel Label

- If you have a hard time decoding the steel designations here, take a look at the text at the top of the dialog (Figure 2-113). These items correspond to the columns of text in the body of the **Shape Picker**, and should help you find the shape you're looking for.

Once you have picked your shape, the **Steel** macro will drop you back into the **Steel Selector Dialog** (Figure 2-114).

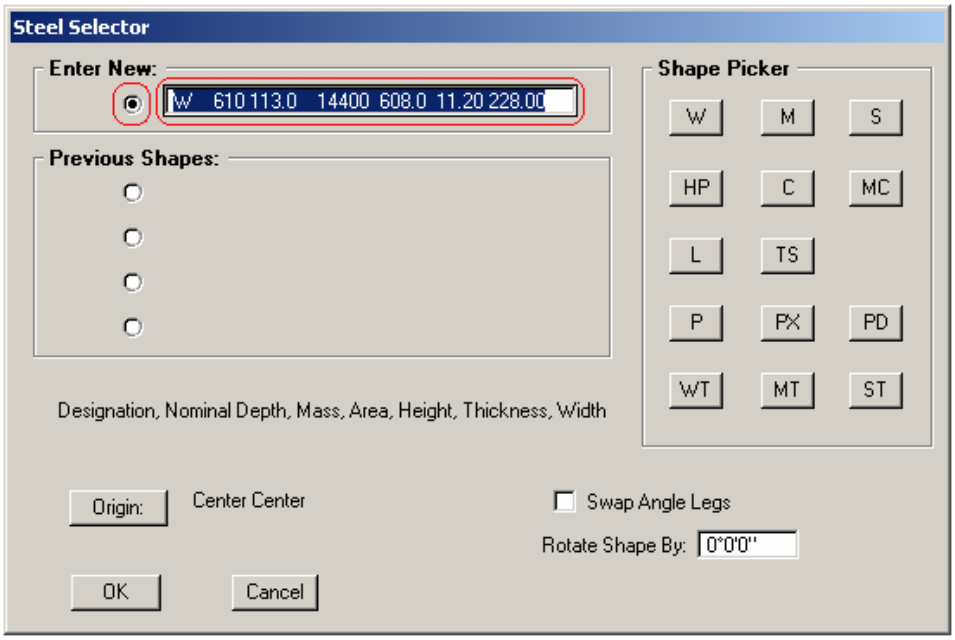


Figure 2-114: Steel Selector Take Two

- Notice that the shape you chose in the previous step is now highlighted in the **Enter New** box, and the **Selection Button** next to it is **Checked**.

Step Three: Choose an Origin

Now you need to make a decision about how you want to place this shape. On the **Steel Selector Dialog**, press the **Origin** button. This will bring up the **Placement Dialog** (Figure 2-115).

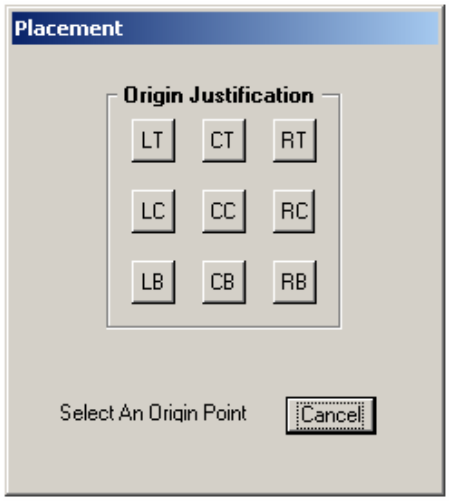


Figure 2-115: Placement Dialog

In the **Origin Justification** section of this dialog, there are nine buttons that you can press to set the justification. Your choice will depend on the detail you are working on. For this example, I'll choose **CT**, which is "Center Top." We'll see the impact of this when I place the shape.

Pressing any of those nine buttons will dismiss the dialog and bring up the **Steel Selector Dialog** again (Figure 2-116).

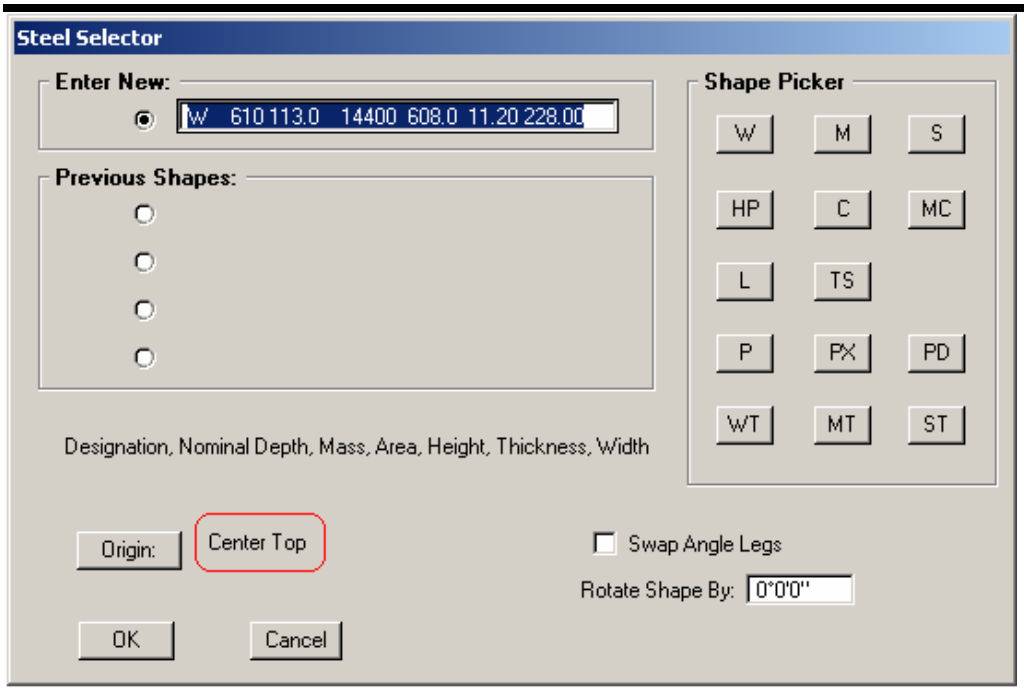


Figure 2-116: Steel Selector Take Three

Notice the **Origin** you selected in this step is displayed next to the **Origin** button. Press **OK** to place the steel shape.

Step Four: Place the Shape

Check your *Status Bar* for the prompt. It should say "Steel > Enter Origin of Shape (Reset to Exit.)" *Datapoint* to place your shape, *Reset* to abort. (You can also *Snap* to choose the origin point more specifically.)

The shape should appear where you *Datapoint* (Figure 2-117).

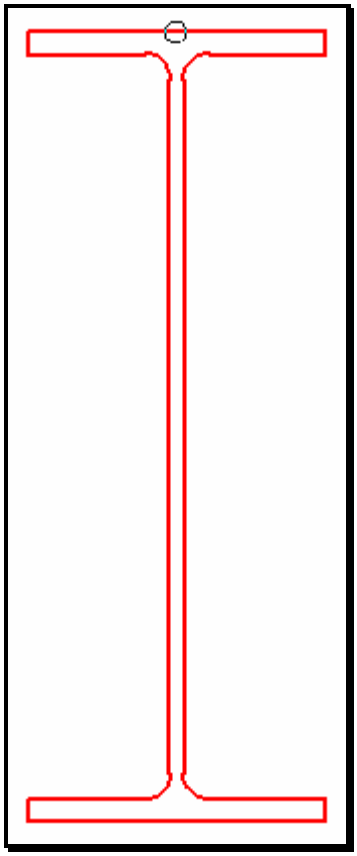


Figure 2-117: Placed Shape

- Notice the circle at the center of the top flange in Figure 2-117. This is the **Origin** point that I selected in **Step Three**.

Option One: More of the Same

If you want to keep placing more shapes like the one you just placed, just keep *Datapointing*. Until you *Reset*, MicroStation will continue to drop a shape wherever you *Datapoint*.

Option Two: Undo

If you have placed a shape in the wrong place, you can *Undo* the placement. From your main menu, select **Edit > Undo Other > To Mark**.

- This uses built-in MicroStation functionality related to setting *Marks* in your drawing – kind of like bookmarks – that allow you to *Undo* back to a specific point. You can set your own marks by choosing **Edit > Set Mark**.

Option Three: Using Previous Shapes

As you run the **Steel** macro a number of times to place different shapes, you should notice that it *remembers* shapes you've already placed. The most recent shape you've used is still in the **Enter New** box of the **Steel Selector Dialog**.

The four shapes you've used previously are stored in the **Previous Shapes** box in the **Steel Selector Dialog** (Figure 2-118).

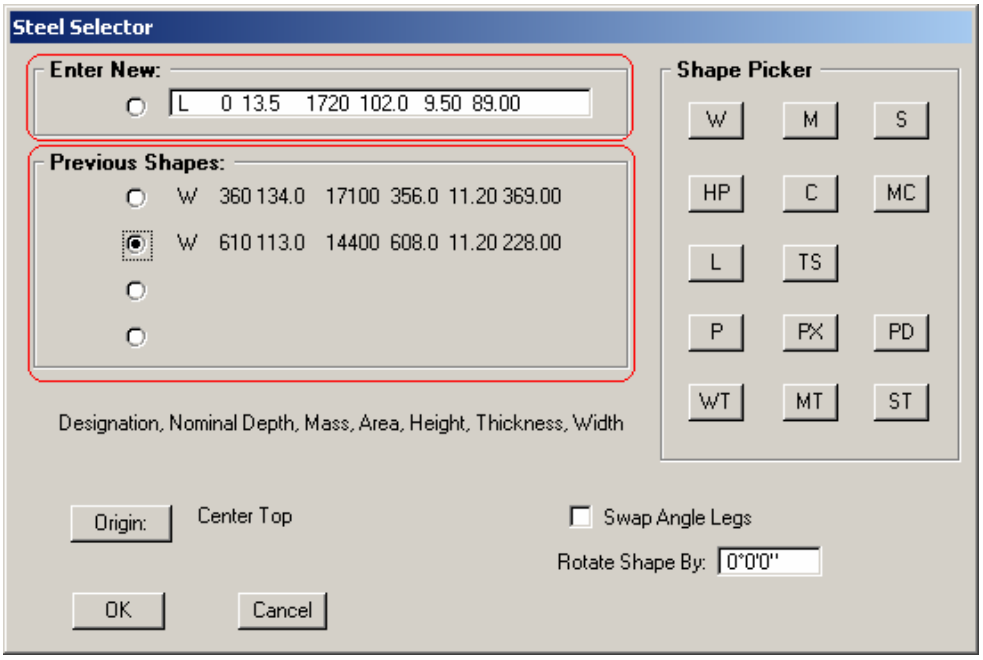


Figure 2-118: Steel Selector Previous Shapes

To place any one of these stores shapes, just **Check** the button next to the shape description, set your **Origin** and press **OK**.

Option Four: Angle Legs

L Shapes are drawn with **Leg 1** as vertical and **Leg 2** as horizontal. The resulting shape looks like an "L".

There are two ways to change the way **Ls** are placed by this macro.

1. Push the **Swap Angle Legs** button. This reverses the placement of **Leg 1** and **Leg 2**. This essentially mirrors the default **L** over a 45° mirror line.
2. Set the **Rotate Shape By** angle to a non-zero value. This spins the **L** counterclockwise by the angle specified.

WELD MACRO

Overview

The **Weld** macro was written to make it easier to place consistent weld symbols on structural details. It prompts you to enter two *Datapoints*: one for the location of the weld, the second for the location of the symbol. Then you fill out a dialog box full of options and the macro places the weld symbol for you!

Step One: Launch the Macro

Run the **Weld** macro from your main menu by choosing **Macros > Weld**.

Step Two: Enter Points

Look in your *Status Bar*. MicroStation should be prompting you to "Select Weld Location to Be Labeled (This is where the arrow points.)

Datapoint or *Snap* to the location of the weld.

Once you have *Accepted*, MicroStation will prompt you to "Select Location of Weld Symbol (This is the end of the arrow.)"

ⓘ ***If you snapped to the first point, you have to snap to define the second point as well. Place a tentative point (away from any element) in the approximate location you want the weld symbol to be drawn, and then Accept.***

Step Three: Fill out the Dialog

Now that you have *Accepted* the location for the weld and the symbol, the macro will open up the **Select Weld** dialog (Figure 2-119).

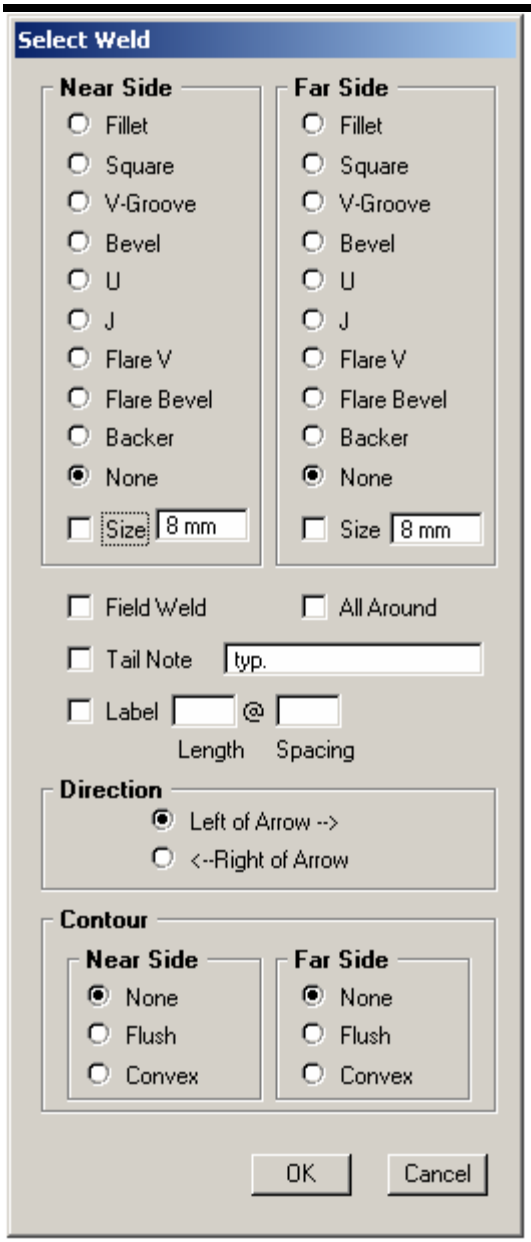


Figure 2-119: Select Weld

Weld Type

At the top of the dialog, you can select a **Near Side** and a **Far Side** weld. **Near Side** symbols will be placed under the line, **Far Side** symbols above the line. The various kinds of symbols are illustrated in Figure 2-120.

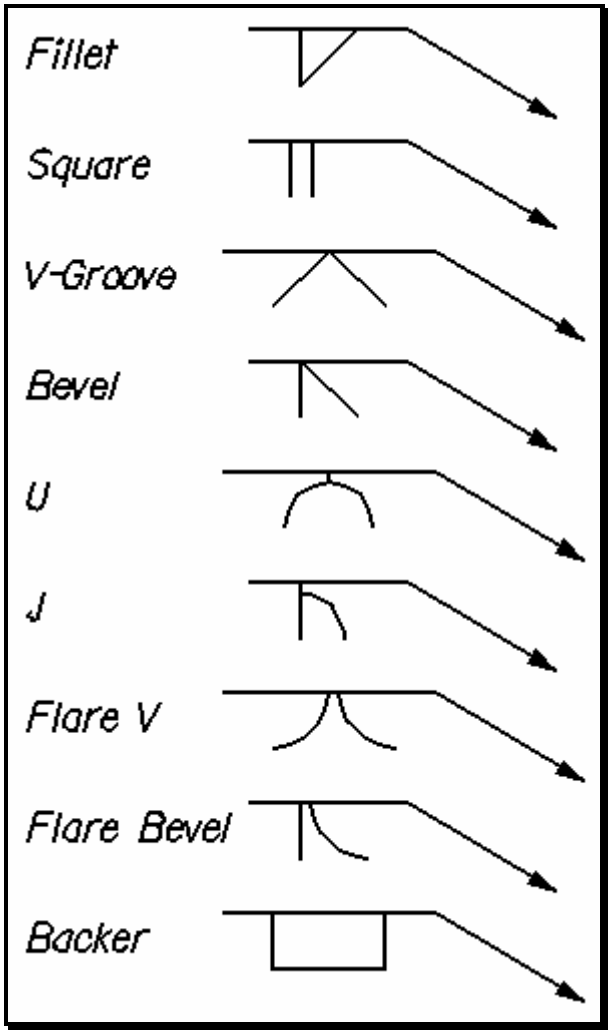


Figure 2-120: Weld Symbols

Choose whatever **Near Side** and **Far Side** welds you would like to show by **Toggling** the button next to the symbol type (Figure 2-121).

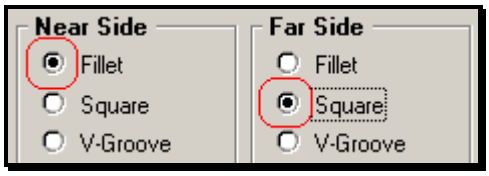


Figure 2-121: Pick Weld Type

- If you accidentally pick a weld type for the **Far Side** when you actually don't want to show a **Far Side** weld, pick **None** from bottom of the **Select Weld Dialog**.

Weld Size

Also in the **Near** and **Far Side** boxes you can make your **Size** selection (Figure 2-122).

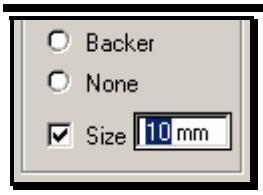


Figure 2-122: Weld Size

Place a **Check** in the box and type a size into the text field.

Field Weld, All Around, Notes, Labeling

Directly under the **Near Side** and **Far Side** boxes, you'll find more weld placement options (Figure 2-123).

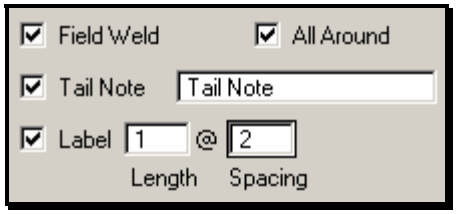


Figure 2-123: Weld Options

These options are illustrated by Figure 2-124.

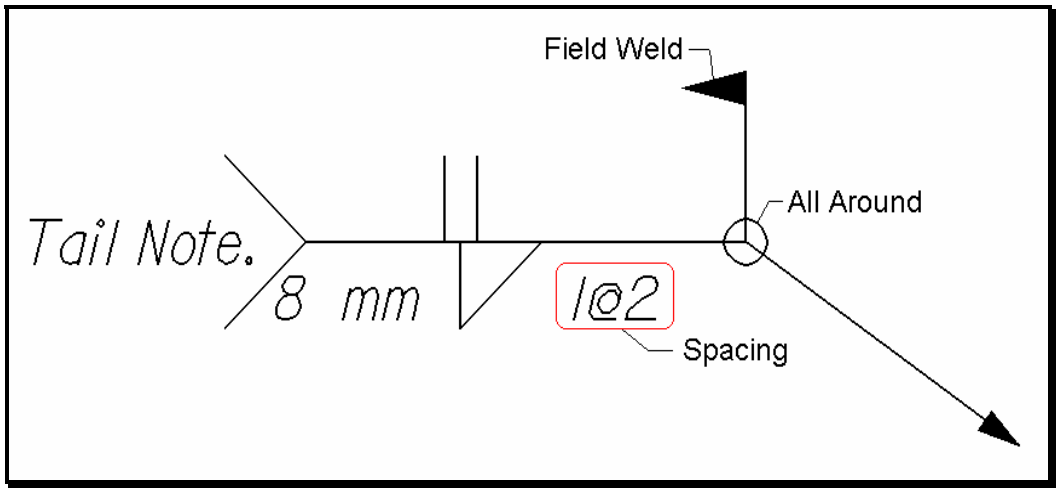


Figure 2-124: Weld Anatomy

Place **Checks** in the appropriate boxes to enable or disable these features and provide text in the text boxes.

Direction

The **Weld** macro is capable of automatically deciding whether the weld symbol should extend to the left or to the right of the arrow. If you want to override the default settings, select a **Direction** from the **Direction Box** (Figure 2-125).

Figure 2-125: Weld Direction

Contour

Near the bottom of the **Select Weld Dialog** there is a **Contour Box** (Figure 2-126).

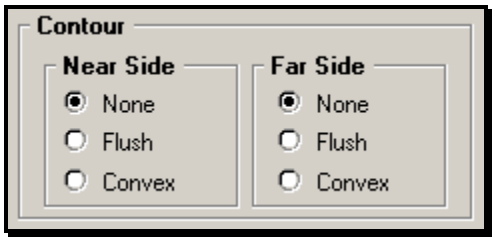


Figure 2-126: Weld Contour

The two options, **Flush** and **Convex** are illustrated in Figure 2-127 on a **Square** weld.

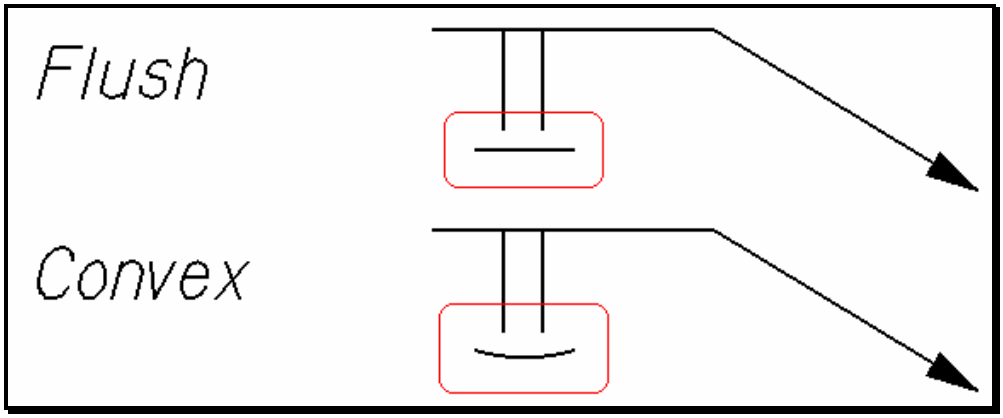


Figure 2-127: Weld Contour Appearance

Step Four: Apply Settings

Press the **OK** button to let the macro draw your weld. Or press **Cancel** to abort the symbol.

Undo It

Similar to the **Steel Macro**, the **Weld Macro** sets a *Mark* before it begins to draw. If you want to *Undo* the creation of a **Weld** symbol, simply choose **Edit > Undo Other > To Mark** from your main menu.

MOVE FILLED SHAPES BACK

Launch the Macro

From your menu, select **Macros > Send Fill Back**.

What Does it Do?

This Macro re-orders the display of elements. It selects all non-filled elements and uses a simple command to re-write them to the end of the design file. This makes them "newer" than the filled elements. New elements display on top of old elements. So by making all non-filled elements "new", we move the filled elements to the "back" of the picture.

BATCH PROCESSOR

Overview

MicroStation has the ability to run commands from a text file and apply the commands to a file or multiple files.

Keyin Commands

To run MicroStation commands, you must first figure out what the valid keyin command is. Select **Utilities>Key-in.**

Chapter 3 Survey Clean-up Procedures

MX DELIVERABLES AND UPDATES

This section is not intended to replace the MX Editors procedure defined in the MX manual. It is described here for the purpose of informing a MicroStation user on the process and the evolution of the file naming.

GENERAL INFORMATION

Standard Naming

The department has a standard naming convention for all drawing files. The main reason for this is that many of our standard *plan view* type drawings for the department have the existing topography information referenced into them by default. This default reference only works when the files are named correctly and when they exist in the correct location.

Please follow procedures outlined below to adhere to these standards. Click this link for a complete list of MDOT Standard File Names or visit our website at www.maine.gov/mdot/cadd-support/microstation/std_filename.php.

Preserving Original Files

The Survey Folder is where the "Original" Survey files are stored. The folder is Read-Only to everyone except for the Survey Editors. MicroStation Survey clean up will be done in the **Topo** folder, unless network speed is an issue, and at which point, it can be copied locally.

✓ *Refer to page 12-1 Regional Workflow documentation for working with files locally. Please consult CADD Support for assistance.*

INITIAL TOPOGRAPHY

Step One: MX Editing

After an initial survey is completed, the Survey Editors will do the necessary MX editing. This editing will consist of the same editing done prior to this document.

Step Two: Create MicroStation Drawings

Create the following drawings and place them in the y:\pin\####\##\Survey\Msta folder. Please be positive that you have the latest MX configuration that utilizes the most up-to-date MicroStation seed files.

3DtopoMMDDYY.dgn

This is the 3D topography file that has only been MX edited.

ⓘ ***Please use a 6-digit date without separators. (i.e. 3Dtopo021402.dgn)***

3DmappingMMDDYY.dgn

This is the 3D Aerial Mapping file that has only been MX edited.

ⓘ ***Please use a 6-digit date without separators. (i.e. 3Dtopo021402.dgn)***

Origtext.dgn

This is the raw text that describes the topographical features. This will include both ground survey and Aerial Mapping text (if there is any).

- The drawing resides at elevation 0.1000, slightly above elevation 0.0000.

Points.dgn

This is all of the points for the topographical features.

- The drawing resides at elevation 0.0000. It will be regenerated with all additional surveys.

Contours.dgn

This drawing is the 3D contour model that includes both the ground survey and Aerial Mapping.

- It will be regenerated with all additional surveys.

Triangles.dgn

This drawing is the 3D triangles model that includes both the ground survey and Aerial Mapping.

- It will be regenerated with all additional surveys.

OrigWetlands.dgn

This drawing is the 3D wetland drawing. It includes all wetland strings identified by a Biologist and flag text associated with them.

Step Three: Update Status Report

Add notes to the **Status.rpt** file located in your PIN's Survey\MX folder.

Step Four: Communication

At this point, send your correspondence to the proper contact in the desired MDOT Program division (i.e. Urban Arterial Program, Bridge Program, etc) to notify them that the survey files are available, however need to be cleaned-up in MicroStation.

TOPOGRAPHY UPDATES

Step One: MX Editing

After the additional survey is completed, the Survey Editors will do the necessary MX editing. This editing will consist of the same editing done prior to this document.

Step Two: Create New MicroStation Drawings (Adds)

Create the following drawings and place them in the y:\pin\####\##\Survey\Msta folder. Please be positive that you have the latest MX configuration that utilizes the most up-to-date MicroStation seed files.

Origtopoadd#.dgn

This file will consist of the updated 3D topographical features and a boundary string if this project utilizes Areial Mapping.

Origtextadd#.dgn

This is the updated text that describes the updated topographical features and/or Areial Mapping.

- The text drawing resides at elevation 0.1000 m, slightly above elevation “0.0000”.

Wetlandsadd#.dgn

This drawing is the additional 3D wetland drawing. It includes all wetland strings identified by a Biologist and flag text associated with them.

Step Three: Regenerate Points, Contours & Triangles

The following drawings require editing and regeneration in MX to update and display the latest information. This editing work will consist of the same procedures done prior to this document. All files will reside in the Survey\Msta folder.

Points.dgn

This will consist of all the original points and all additional points for all of the topographical features.

Contours.dgn

This drawing is the 3D Contour model. This will incorporate the original Contour model with the new Contour model (both ground survey and Aerial Mapping), providing one complete, seamless model.

Triangles.dgn

This drawing is the 3D Triangle model. This will incorporate the original Triangle model

with the new Triangle model (both ground survey and Aerial Mapping), providing one complete, seamless model.

Step Four: Regenerate Topo Model

In MX, combine the old ground model with the new ground model and create a file called **3DtopoMMDDYY.dgn** (supplying current date in place of MMDDYY) and place it in the Survey\Msta folder. Leave the ZZ string in the file to help identify the area that has been updated.

- This file contains the most complete ground topographical features as of the date in the filename.

ⓘ ***Use a 6-digit date without separators. (i.e. 3Dtopo021402.dgn)***

Step Five: Recreate Mapping Model

If this is a mapping project, and additional ground survey was completed, remove the portion of the mapping model defined by the boundary string and create a new file called **3DmappingMMDDYY.dgn** (supplying current date in place of MMDDYY) and place it in the Survey\Msta folder. Leave the boundary in the file to help identify the area that has been updated.

ⓘ ***Use a 6-digit date without separators. (i.e. 3Dtopo021402.dgn)***

Step Six: Update Status Report

Add notes to the **Status.rpt** file located in your PIN's Survey\MX folder.

Step Seven: Communication

At this point, send your correspondence to the proper contact in the desired MDOT Program division (i.e. Urban Arterial Program, Bridge Program, etc) to notify them that the updated survey files are available, however they need to be cleaned-up in MicroStation.

ⓘ ***The end product, in the Survey\Msta folder, is to have all individual topographical files preserved as historical data, enabling someone to track what was done and when. This folder also contains a combined, topographical drawing called 3DtopoMMDDYY.dgn, which contains the complete ground topography (old and new) as of the date indicated in the filename. It also may contain the latest 3DmappingMMDDYY.dgn, which contains only the mapping data with a hole(s) indicating where ground survey was supplied.***

Step Eight: Create Zip Files For A Design Consultant (If Necessary)

If this project is going to be done by a design consultant, create a zip file and place it in the Survey\Consultant folder. Use the PIN number and Town Name in the filename (i.e. 8467Topsham.zip).

Breakdown of files sent to a consultant

MX files:

Traverse.inp file(s) contains the adjusted Traverse & generates the Traverse Model.

Ground01.inp file(s) contains the topographic features from the field survey.

Ground01.out file(s) contains the resulting X, Y, Z coordinates & associated point number above data.

Ground01.inc file(s) generates the topographic features with associated text.

Ground01.rep file(s) shows the labels X, Y, Z coordinates with associated text.

Contours.inp generates the Triangles & Contour Models.

Points01.str & Points01.txt file(s) generates the Point Numbers as surveyed from the field.

- MX users may need to process multiple sets of numbered files (i.e. ground01.inp through ground10.inp) as opposed to running the highest numbered file.

MicroStation files:

Topo.dgn is the Survey (cleaned-up and flattened). This file, if cleaned-up, is located in the **topo** folder of the PIN number.

Text.dgn is the text associated with Survey data (cleaned-up and flattened). This file, if cleaned-up, is located in the **topo** folder of the PIN number.

Points.dgn are the field Survey point numbers. This file resides in the Survey\MSTA folder.

Wetlands.dgn is the name of the cleaned up version of the wetlands drawing. It is located in the topo folder. If the file has not been cleaned up, the file will reside in the Survey/MSTA folder and is called **origwetlands.dgn.**

Contours.dgn is the 3D contours drawing. This would also include Aerial Mapping Contours. The file resides in the Survey\MSTA folder.

- There is a contours drawing in the topo folder also, but it has been flattened.

3DtopoMMDDYY.dgn is the 3D MicroStation design file (.dgn) of the Survey. This file resides in the Survey\MSTA folder.

3DMappingMMDDYY.dgn is the 3D MicroStation design file of the Aerial Mapping (only on Photogrammetric Mapping projects). This file resides in the Survey\MSTA folder.

origtext.dgn is the 3D MicroStation design file of the text associated with ground survey data and Aerial Mapping. This file resides in the Survey\MSTA folder.

Triangles.dgn is the 3D triangulation file for the project. This would also include Aerial Mapping Triangles. This file resides in the Survey\MSTA folder.

ⓘ ***When a design consultant requests survey information for a project, the 3DtopoMMDDYY with the most recent date is the one file containing all the latest 3D topographical data. It will not be necessary to send any of the Origtopoadd#.dgn files.***

Step Nine: Communication to Consultant Coordinator (if necessary)

Send usual correspondence to the Consultant Coordinators in the Programs.

MICROSTATION CLEANUP PROCEDURES

GENERAL INFORMATION

Standard Naming

The department has a standard naming convention for drawing files. The main reason for this is that many of our standard *plan view* type drawings for the department have the existing topography information referenced into them by default. This default reference only works when the files are named correctly and when they exist in the correct location.

Please follow procedures outlined below to adhere to these standards. The standard file names for existing Survey information residing in the **Topo** folder are Topo, Text, Contours, Points and Wetlands. These are the only five files that should permanently live in the **Topo** folder. Click this link for a complete list of MDOT Standard File Names or visit the website at www.maine.gov/mdot/cadd-support/microstation/std_filename.php.

Preserving Original Files

The Survey\Msta Folder is where the "Original" Survey files are stored. The folder will act as the topographical history for any given project. A user can open the folder and tell what was done for original survey, and all subsequent topoadds. The folder is Read-Only to everyone except for the Survey Editors, therefore, MicroStation Survey clean up will be done in the **Topo** folder. If network speed is an issue because of proximity to the server, then copy the necessary files locally.

- ✓ *Regional Office users should refer to page12-1: Regional Workflow documentation for working with files locally. Please consult CADD Support for assistance.*

The End Result

The end result is to make the Topo and Text drawings, which exist in the **Topo** folder, a combination of all Survey topography and text for the project (including Aerial Mapping data). This would leave no question as to which drawings need to be referenced to display all of the existing, cleaned up topography for the project.

INITIAL TOPOGRAPHY CLEANUP

Quick Punch List

- Copy files from Survey/MSTA to Topo folder
- Rename files
- Cleanup Files
- Flatten Files
- Add note to Cleanlog.txt file

♫ This punch list is to give an overview of what is to be done with original survey files. If the topography is needed prior to the cleanup, copy the files to the topo folder and rename them.

Determine Direction of Proposed Alignment

This step is very important. If you haven't already, take necessary steps to determine who the Project Manager is for the project. Ask which direction that they anticipate the alignment to be laid out. If this is unknown, **do not** cleanup this drawing until it's been established.

Step One: Open Windows Explorer

Open Windows Explorer **(Start>Programs>Accessories>Windows Explorer)** and browse to your project on the y: drive.

♫ **Regional Offices**: Copy the project folder to your local C:\PIN or D:\PIN folder and continue with the steps in this document, substituting your C: or D: drive where the document says Y: drive.

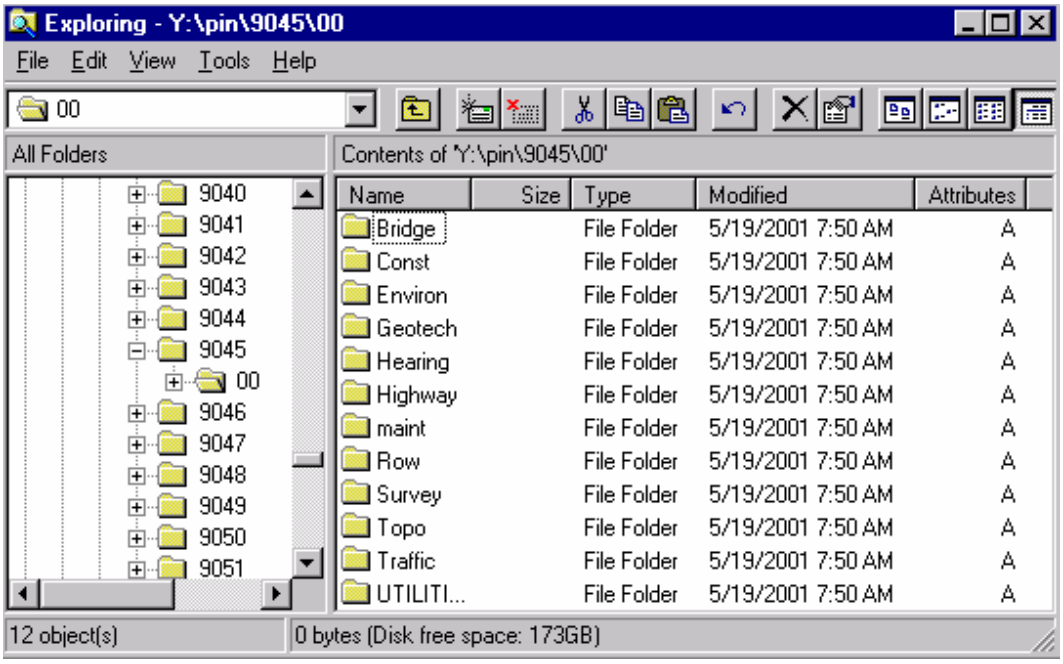


Figure 3-1: Browse with Windows Explorer

Step Two: Open the Topo Folder

In the example above (Figure 3-1), double click the Topo folder to display its contents. This folder should be empty. If it is, proceed to the next step.

ⓘ ***If this folder already contains files, someone may have started Survey cleanup on this project. <u>Do not</u> overwrite these files with the next step. Open the Cleanlog.txt file to see if there are any "cleanup" notes. Skip to Step Four: Open MicroStation.***

Step Three: Copy Files from Survey\Msta to Topo Folder

Part One: Browse to Survey\Msta

With Windows Explorer still open, browse to the Survey\Msta folder, displaying its contents in the rightmost window.

Part Two: Select Files

Select the following files (Hold **Ctrl** to select more than one at a time): **3DtopoMMDDYY.dgn, 3DmappingMMDDYY.dgn (if one exists), Origtext.dgn**, **Contours.dgn** and **Points.dgn**.

ⓘ ***If there are more than one 3DtopoMMDDYY.dgn files, this indicates that there has been topoadd's done for this project. Select the most recent file based on its date. If no cleanup has been done, cleanup up the latest dated file and you will be taking care of every topoadd, including the original topo. All topography is displayed in the latest 3DtopoMMDDYY.dgn file. Always check the Cleanlog.txt file to see what has been cleaned up.***

Part Three: Copy

From the Main Menu, select **Edit>Copy** (Figure 3-2)**.**

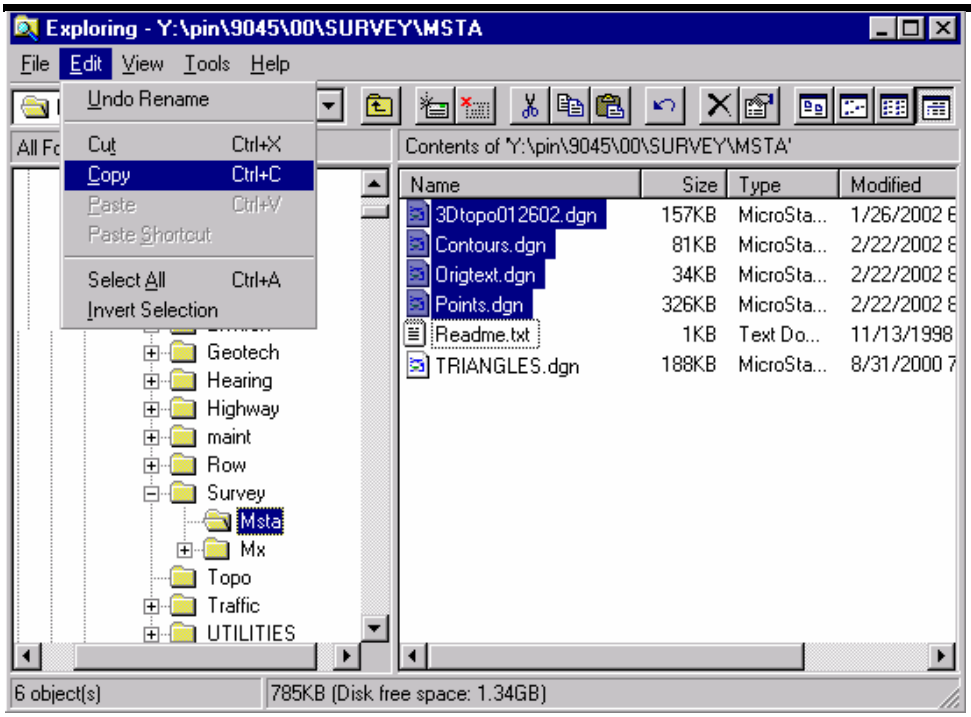


Figure 3-2: Select and Copy files from Survey\MSTA folder

Part Four: Paste

Click on the **Topo** folder. From the Main Menu select **Edit>Paste** (Figure 3-3)**.**

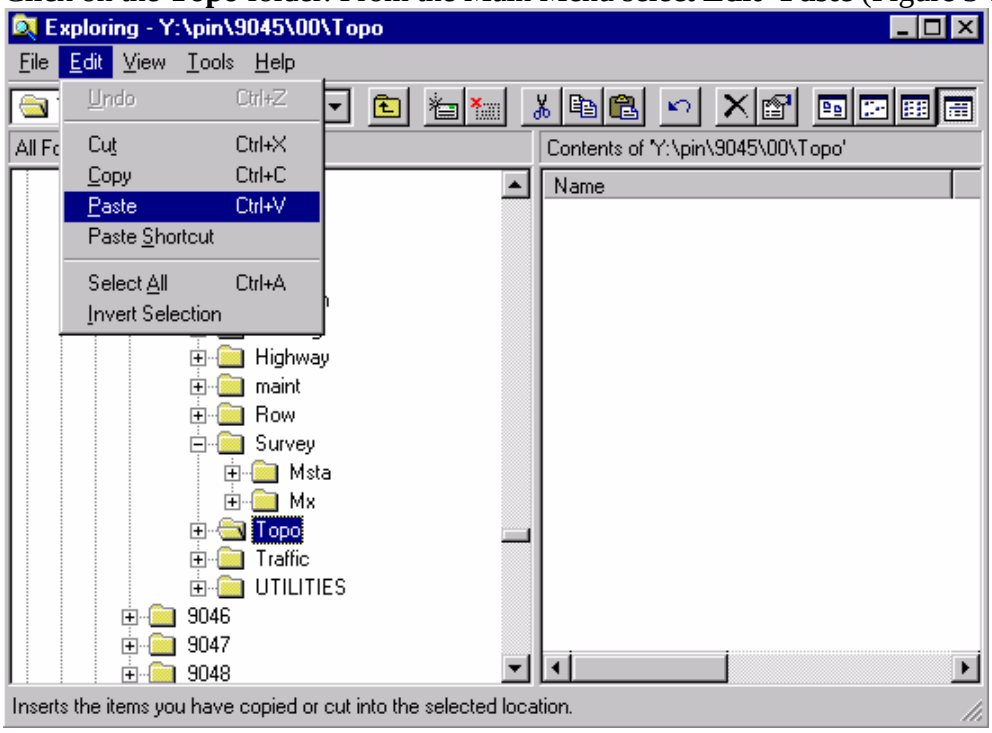


Figure 3-3: Paste files from Survey\MSTA folder to Topo folder

Part Five: Rename Topo, Text and Mapping

Select **3DtopoMMDDYY.dgn.** From the Main Manu, select **File>Rename.** Begin typing the new name, which is **Topo.dgn.** Hit Enter to accept this name.

Select **Origtext.dgn.** From the Main Menu select **Files>Rename.** Begin typing the new name, which is **Text.dgn.** Hit Enter to accept this name.

Select **3DmappingMMDDYY.dgn.** From the Main Menu select **Files>Rename.** Begin typing the new name, which is **Mapping.dgn.** Hit Enter to accept this name.

Part Six: Add Notes to Cleanlog.txt File!

As a courtesy to others, always add a note to the **Cleanlog.txt** file located in the **Topo** directory as progress is made during the cleanup process. Here are a few examples of informative cleanup notes.

03/04/02 John Doe - Started **Topo.dgn** cleanup.

03/04/02 John Doe - Started **Mapping.dgn** cleanup.

03/07/02 John Doe - Finished **Topo.dgn** cleanup.

03/07/02 John Doe - Started/Finished **Text.dgn** cleanup.

- Regional Office employees that copy the project locally should browse to the Y:drive PIN folder and make the edits to the network copy of the Cleanlog.txt file so that other employees can check the status of the project. If you make the comments to your local Cleanlog.txt file, no one else can see this but you.

Step Four: Open MicroStation

Open MicroStation by clicking the Icon on your desktop. When the *MicroStation Manager* window appears, pick your project from the *Project* pull down. Browse to the **Topo** directory by double clicking your project number's decimal folder (i.e. pin\9045**"00"** folder), then double clicking the "Topo" folder.

- If the project pull down does not take you to your project, contact your CADD Support personnel.

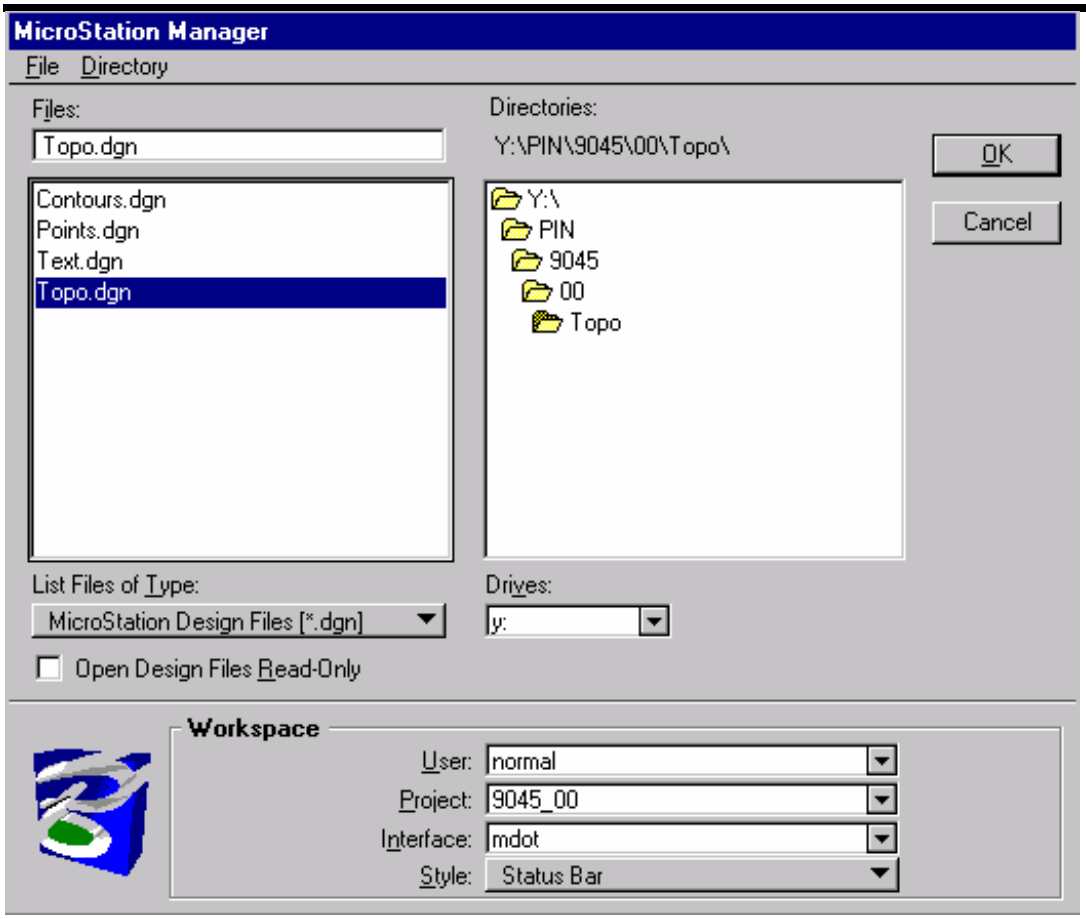


Figure 3-4: Select the topo.dgn and click OK

You should see four or five drawings on the left. Select **topo.dgn** (Figure 3-4) and click **OK.** Once the file is open, click *Fit View* from *Window 1's* view control toolbar. Close *Window 2, Window 3and Window 4* if necessary and maximize *Window 1.*

ⓘ ***If the Topo directory is empty, go back to Step Three and copy files.***

Step Five: Attach Reference Files

The **topo** and **text** drawings do not have any reference files attached by default. Even though you can only edit one file at a time, it is helpful to have both drawing displayed. Select **File>Reference(DOT)>Attach** from the Main Menu. Select the **Text.dgn,** browsing to the **Topo** folder if necessary. Click OK. It is not necessary to enter a *Logical or Description.* Attach by *Coincident World* method. Repeat this process for the **Points.dgn** and **Contours.dgn** drawings. To shut off the display of these two reference files, open the *Reference File* dialog (**File>Reference** from the Main Menu), click the "checkmark" in the *Display* column of the reference files you wish to shut off.

Step Six: Turn Off Line Weights (Optional)

Some users prefer to have line weights shut off. To do this, select **Settings>View Attributes** (Ctrl+B) from the Main Menu. Uncheck Line Weights. Hit **Apply.** Close View Attributes Window.

Step Seven: Adjust Level Display (Optional)

You may want to shut off levels 8 (H_V CONTROLS) and 12 (GROUND) in the **topo.dgn.** These are the Traverse Points and the Ground Elevation strings. No Cleanup is required on these elements, and shutting them off reduces the clutter on the drawings. This is done by selecting **Settings>Level>Display (Ctrl+E)** and deselecting the levels you don't want to be displayed (Figure 3-5).

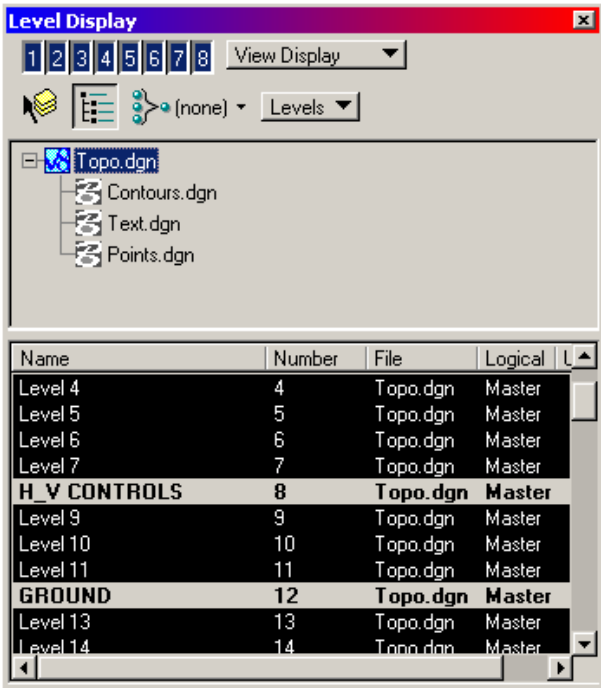


Figure 3-5: Deselected Levels in the Level Display

Refresh the view if necessary. Close this dialog box.

Step Eight: Load Clean-up Tools (Optional)

From the Main Menu, select **Tools>Tool Boxes…**

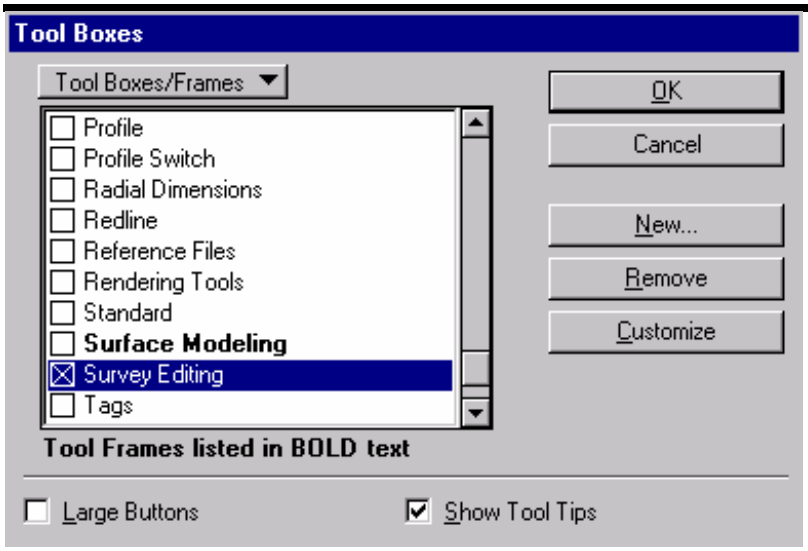


Figure 3-6: Tool Boxes dialog

Scroll down the list and click to place an "X" in the **Survey Editing** box (Figure 3-6). Click **OK**. A new set of tools should appear.

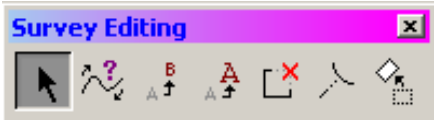


Figure 3-7: Survey Editing Tool Box

These *Survey Editing* tools (Figure 3-7) are dockable and will auto-load next time you enter MicroStation.

ⓘ ***If you do not have these tools as an option, contact your CADD Support.***

Element Selection Tool: Can be used to select individual elements or multiple elements by holding the **Ctrl** key. (Also located in the *Main* Tool Box.)

Change Element Direction Tool: Use this to reverse a custom linestyle direction. (i.e. Trees and Bushes). (Also located in the *Modify* Tool Box.)

Edit Text: Says it all. (Also located in the *Text* tool box.)

Change Text Attributes: Used to change the text to the MDOT standard height and width. (Also located in the *Text* tool box.)

Partial Delete: Used to delete part of an element. (Also located in the *Modify* Tool Box.)

Extend Element to Intersection: Used to extend an element. (Also located in the *Modify* Tool Box.)

Rotate: Used to rotate individual elements (i. e. text and cells) around a user-defined point or origin point. (Also located in the *Manipulate* Tool box)

ⓘ ***For a detailed description of any tool, select Help>Contents and then Help>Tracking. Click on each tool, one at a time, and look to the Help window for a description.***

Step Nine: Adjust Ditch Arrows (May be Necessary)

General Information

Adjusting the direction of existing ditches (as of December 2002) is now a responsibility of the MX editor. They are supposed to make the adjustments in MX and the direction should be correct when the drawings are translated into MicroStation. Older projects may still require editing in MicroStation.

Part One: Adjust Display Of Topo.dgn to Isolate Ditch and Culverts (Optional)

All ditch lines must be checked to see that the arrows point in the direction of the flow of water. To isolate the ditch lines, open the *Level Display* by selecting **Settings>Level>Display (Ctrl+E).** With topo levels displayed, ***Right Click*** anywhere in the Levels area and select **All Except Element** (Figure 3-8).

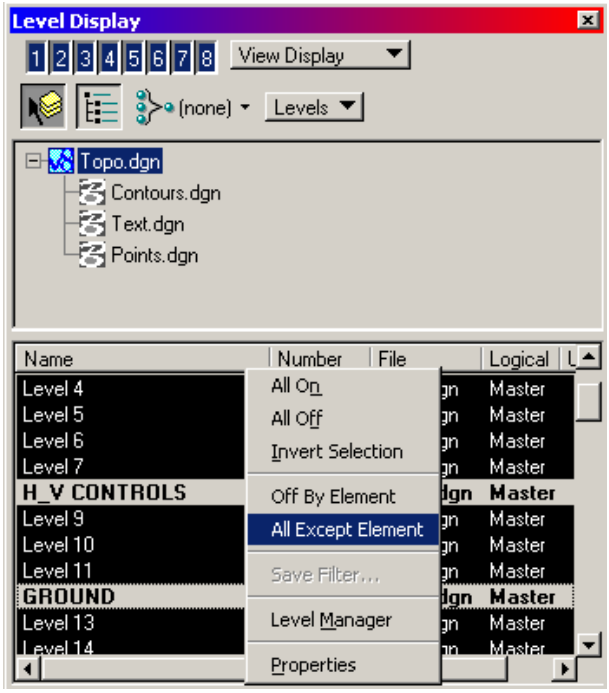


Figure 3-8: Right Click and Select All Except Element

Click on any ditch line or culvert pipe. Click to *select* the element, then, click to *accept it.* Only the "Open Drainage" items will be displayed. Close the dialog.

Part Two – Option A: Using Elevation to Determine Direction

An accurate way to determine flow direction is to check the elevation at both ends of the ditch line while it is still 3 dimensional.

Shut off *Depth Lock* by selecting **Settings>Locks>Depth** from the Main Menu. Use a *Keypoint* snap (default snap) with your middle mouse button and click on one end of ditch line. Look to the Status bar located in MicroStation's status bar (Figure 3-9).

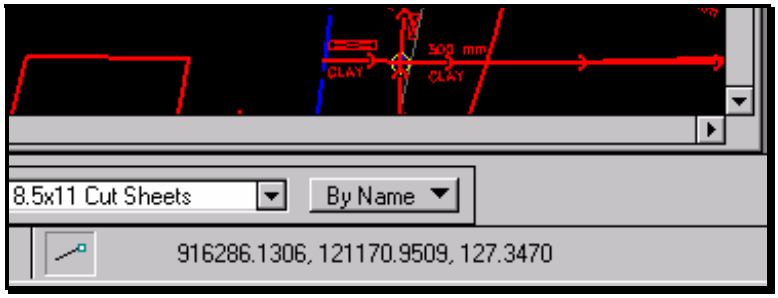


Figure 3-9: X, Y and Z coordinate displayed in MicroStation Status bar

The elevation (Z) is the rightmost set of numbers (or look in the Z field of *AccuDraw)*. Click on another vertices of the line to determine which direction the ditch is flowing. Use the **Reverse Directions** tool to change directions if necessary. An example of using the tool is in the next step.

Part Two – Option B: Using Contours to Determine Direction

Turn on the display of your **Contours.dgn (File>Reference** from the Main Menu**)** to quickly determine flow direction. Place a "check mark" in the display area for contours.

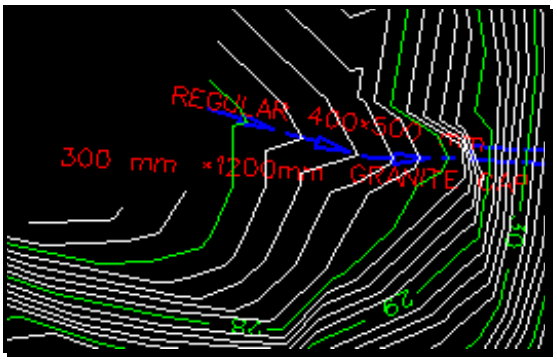


Figure 3-10: Example of ditch arrow in wrong direction

In the Example above (Figure 3-10), the ditch arrow is pointing from the 27.00 +/- to 29.00 +/-, which is uphill and therefore wrong.

Part Three: Click the Reverse Direction Tool

Click the tool and follow the prompts in the bottom left status bar.

Part Four: Select the Line (Identify the Element)

Click on the line with a left mouse button. An arrowhead will appear (Figure 3-11) displaying the current direction of the line.

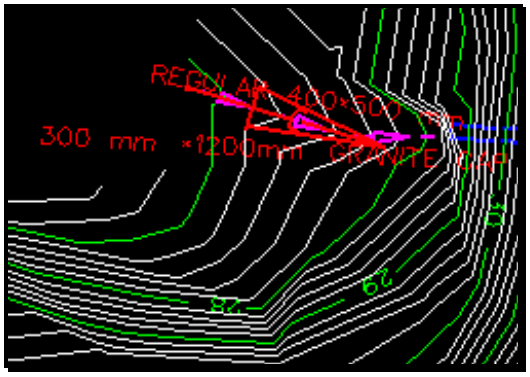


Figure 3-11: Reverse Direction tool in action

Part Five: Define Start of the Line

The prompt is telling you to click anywhere near the opposite end of the line. This will make the other end the starting point (Figure 3-12). As long as the click on the screen is beyond the midpoint of the line, it will reverse directions.

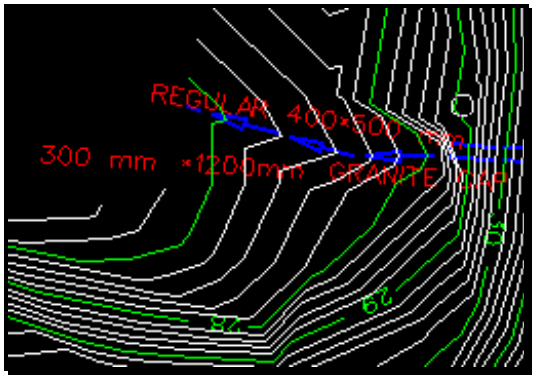


Figure 3-12: Reverse Direction results

Part Six: Adjust Level Display (If You Adjusted it to Isolate Drainage)

Turn on the levels that you shut off. From the Main Menu, select **Settings>Level>Display (Ctrl+E).** With the *topo* levels displayed, ***Right Click*** anywhere in the levels area and select **All On.** Click on the 8 (H_V CONTROLS) and 12 (GROUND) to shut off these two levels. Close Window.

Step Ten: Flatten Your Drawing

From the Main Menu, select **Macros>Flatten.** Click **OK** to accept "0.000" as the desired elevation to flatten to. Click anywhere in the view window to accept the command. Fit your view.

Step Eleven: Determine Direction of Proposed Alignment

This step is very important. Take necessary steps to determine who the Project Manager is

for the project. Ask which direction that they anticipate the alignment to be laid out. If this is unknown, **do not** cleanup this drawing until it's been established.

Step Twelve: Adjust View and Save Settings (Optional)

Rotate the View Window

If your project is not running from left (West) to right (East), you may want to rotate your view window so that the majority of the project is horizontal across your screen. Select **Rotate View** from Window 1's *View Controls* (Figure 3-13).

Figure 3-13: Rotete View Tool

When the *Rotate View* dialog appears, set method to 3 points. **First point (0/0),** click on screen where you want the lower left corner of the new window to be. **Second point (+X direction),** click where you'd like the bottom right corner of the view window to be. **Third point (+Y direction)**, click to define the top left corner of the view window (Figure 3-14).

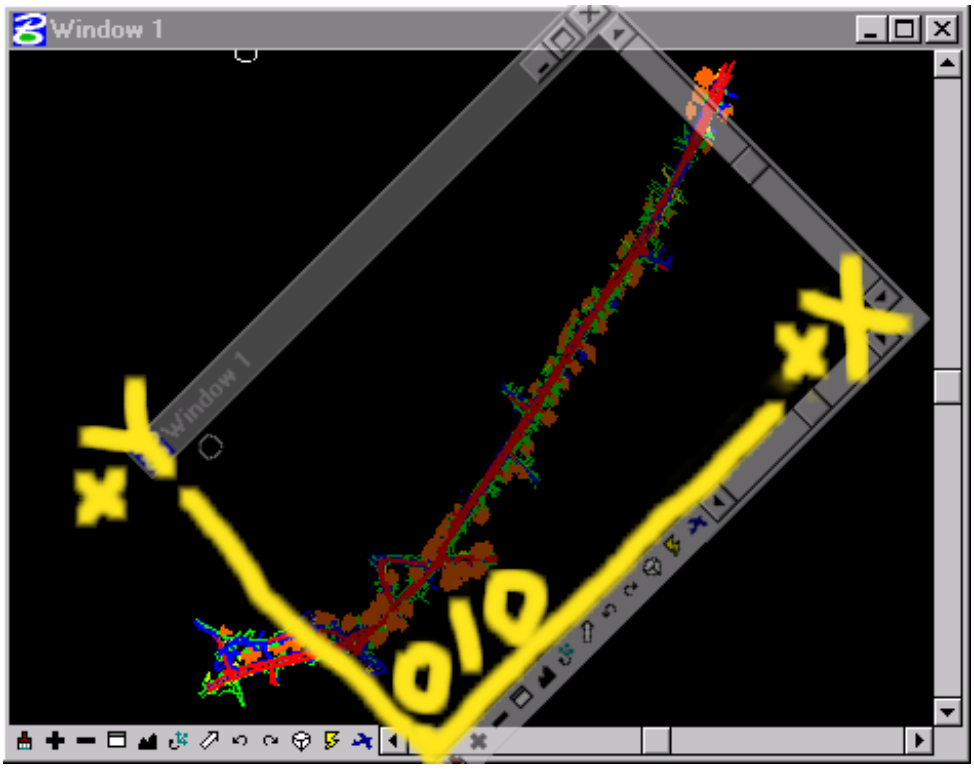


Figure 3-14: Rotating your View

- Rotate View as often as necessary to get the majority of elements horizontal in your view. It is best **not** to snap to elements in your file while performing this command, unless you lock your "Z" prior to doing so **(Macros>Set/Lock Z).** A slightly skewed view may result if the 3 elements snapped to are at different elevations.

Graphic Group Unlock

Disable Graphic Groups by selecting **Settings>Locks>Graphic Groups** from the Main Menu or click the padlock on the status bar and click Graphic Groups to remove the checkmark.

Save Settings

To save these settings as your default view for the file, select **File>Save Settings.**

- If Save Settings is grayed out, this means that your current preferences are to save settings on exit. It will accomplish what this step is intended to do.

Step Thirteen: Reverse Element Direction

There are many other directional elements (like ditches) that may require reversing in the **Topo.dgn.** Use the **Reverse Directions Tool** to reverse tree lines, bush lines, house lines, curbing lines, guardrail strings, wetland lines, river and water lines and other underground utility lines, to correctly display each element.

Tree lines, Bush lines and Gardens should have the "rounded" side towards road. The rounded cell in the line is representing the canopy or outer edge of the wooded area.

The heavier line of a **house and river** line style represents the outer edge of that object. House lines may have two or more segments to reverse.

Underground utility lines and wetland lines have text imbedded in them that may require reversing. Water lines, for example, may need to be reversed to show the 'W' symbol aligned correctly with the centerline or plan sheet.

Curbing lines may need to be reversed so that the symbol will fall closest to the edge of pavement or dashed edge of concrete, gravel or planting.

Guardrail lines may need to be reversed so that the posts are away from the roadway.

Click on Change Element Direction Tool and reverse the string(s) (may have more than one segments to reverse).

Part One: Click the Reverse Direction Tool

Click the tool and follow the prompts in the bottom left status bar.

Part Two: Select the Line (Identify the Element)

Click on the line with a left mouse button. An arrowhead will appear displaying the current direction of the line.

Part Three: Define Start of the Line

The prompt is telling you to click anywhere near the opposite end of the line. This will make the other end the starting point. As long as the click on the screen is beyond the midpoint of the line, it will reverse directions.

- You may have trouble reversing closed elements (shapes, blocks, etc.) and elements that go in both directions. Try deleting a small portion of the element using the *Delete Partial* tool. Click on the Partial Delete Tool. Click anywhere on the string, then without moving the cursor away from the center of AccuDraw's compass, click where you originally clicked forming a partial deletion of the line that is unnoticeable.

Step Fourteen: Rotating Topography Cells

General Information : What to Rotate

Iron Pins - Rotate so that the text in the cell runs parallel with the roadway. Iron pin rotation will vary from pin to pin, so it's better to rotate these individually.

Power, Telephone and light poles - Poles that have a line through them should be rotated so that the line is perpendicular to the centerline of the roadway. A light pole would have its mast over parking lots or the roadway.

ⓘ ***The point that a Pole is picked up in the field is its face closest to the centerline of the roadway. While cleaning up the poles, consider moving the pole so that the intersection of the line and circle is represented as the face of the pole closest the roadway. Make a note in the CleanLog.txt file.***

Single Post Street signs - The flat side of the sign should be facing the oncoming lane of traffic, unless it is a 'No Parking' sign or an entrance to a business. These will be facing the street (as seen in real life).

Double Post Signs - Double posted signs are created with a linestyle. This linestyle is directional and may need to be reversed to face traffic or the roadway.

Mailboxes - The short, flat side of mail box cell should be parallel to centerline, with the two pointed ends away from the road.

Catch basins & Drop Inlets - The "grate lines" should be perpendicular to curb / edge of pavement (so a bicycle wheel won't drop into them).

Hydrants - Rotate so that the spout is facing the roadway (as seen in real life).

Sill Elevations on buildings - The letters "Sill El" should generally be perpendicular to the building wall. If on the front face of building, rotate them so they are perpendicular and inside the building.

Global vs. Individual Rotation Introduction

Most cells will come in from the cell library at the same orientation (with the exception of Iron Pins and sill shots) and will need to be rotated around their individual origins to align with the centerline at that specific location on the project.

One pass **Globally,** using selection sets through the entire project will align the majority of cells correctly. The cells that it doesn't correct will most likely be an even 90-degree increment away from being correct.

ⓘ ***This method works best on the straight portions of your project. Areas on a curve can be dealt with by using smaller selection sets or simply by using individual rotation methods.***

Utilize the **Individual rotate** command for Iron Pins, signs and other item that need final tweaking. Intersections of Side Roads require a bit more attention in this respect.

Global Rotation: Select Multiple Cells to Rotate

Identify a portion of your project that is fairly straight. If your project is one big curve use small selection sets so that global rotation will be effective.

To set your editing filter to only cells in your file, go to **Edit>Select By Attributes.**

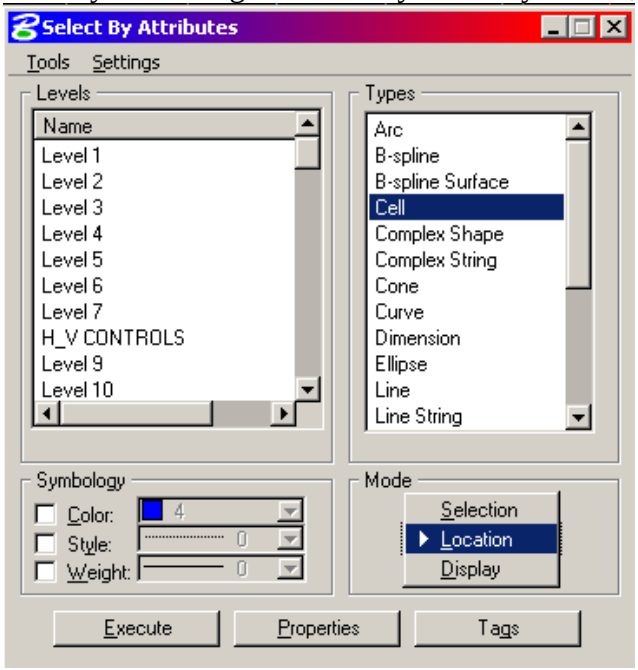


Figure 3-15: Select By Attributes set to locate cells only

In the *Types* portion of the dialog, select **Cell.** In the *Modes* section of the dialog, change *Selection* to ***Location*** (Figure 3-15)**.** Hit *Execute*. Now you are only able to edit (rotate) cells in your file for the time being. If the dialog gets in the way, you can close it and click OK to keep the edit filtering "on" (Figure 3-16). When done editing cells, open **Select By Attributes** again and hit cancel to stop filtering.

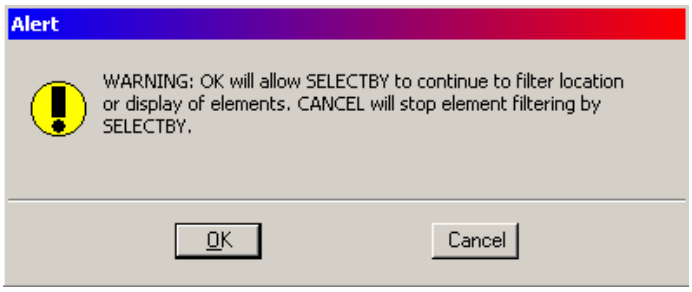


Figure 3-16: Select By Attributes Alert Message

Using the Power Selector - The power selector works well for selecting single or multiple cells because of the various selection methods. You can also add and subtract from your selection set easily. Choose *Shape* method and choose the "**+**" in the mode field (Figure 3-17).

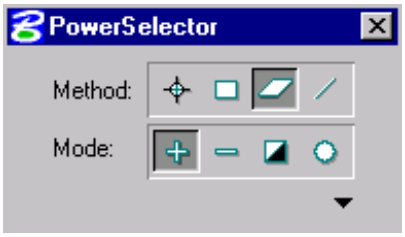


Figure 3-17: Power Selector set to shape

Left click to form a shape around the cells you want to rotate, returning back to the beginning point to close the shape. You should see them highlight.

- To create new selection sets, hit your "spacebar" to clear the current selection set (while focus is in *Power Selector* dialog) and place a shape around the new set of cells.

✓ *Refer to page 2-28 for more information on the Power Selector tool.*

Click the **Rotate** tool from the Survey Editors tool box or the Main tool frame. In the Tools Setting box, click the down arrow (Figure 3-18) to *Show Extended Information.* Place a checkmark in the *About Element Center* box (Figure 3-19) of the dialog box.

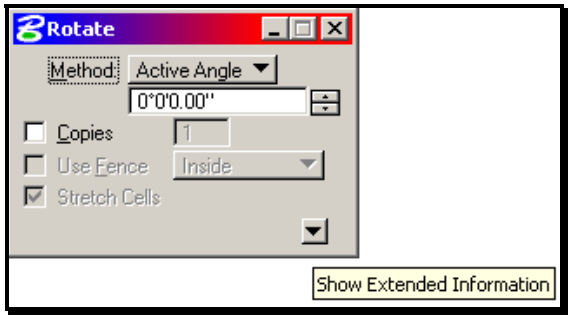


Figure 3-18: Rotate Element's Show Extended Information button

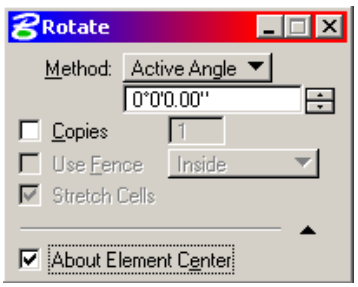


Figure 3-19: Rotate Element's About Element Center box

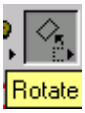
Active Angle method: Take a rough guess of what the angle would be between the cell and the roadway. In the **angle** field, type in the angle. If you don't have any idea what the angle

might be, try using a 5-degree rotation and click multiple times on the screen to continue rotating this amount. (Type in a "-" for a clockwise rotation.)

2 Points method: Click on the screen and you are dynamically rotating the cells around their origins. Move your cursor around the *AccuDraw's* compass until the majority is rotated correctly. Click to *Accept* this rotation. Right Click to stop rotating.

Individual Rotation

To perform individual rotations, rotate the cells around the point established by the Survey Crew, which is also the center/origin point of most cells.



Click the **Rotate** tool from the Survey Editors tool box or Main tool box. In the Tools Setting box, click the down arrow to *Show Extended Information.* Place a checkmark in the *About Element Center* box of the dialog box. Click near the cell (the actual pivot is set to the cells origin based on the tool setting). The cell will rotate dynamically as you move the mouse around *AccuDraw's* compass. Left click again to define the amount of rotation. Right Click to stop rotating the cell.

Step Fifteen: Moving Vertices

You may need to connect any storm sewer pipes, sanitary pipes, water lines and other underground utilities. Do this only if absolutely certain that the like-sized pipes that point towards each other actually connect underground. A field inspection or correspondence with town or city utility companies by the Project Manager may be necessary in an urban situation.

Use the *Modify Element* tool to move one end of the line to the center of the desired utility manhole, catch basin or water gate.

Delete duplicate lines.

Step Sixteen: Adjust and Save Changes (Courtesy To Others)

Rotate Window 1 back to a top view. Click on *Rotate View* and set the *Method* to **Top**. Click in the view to accept the new rotation. Select **File>Save Settings.**

- If Save Settings is grayed out, this means that your current preferences are to save settings on exit. It will accomplish what this step is intended to do.

Step Seventeen: Add Note to Cleanlog.txt File!

Make a comment to the Cleanlog.txt to let people know that the topo has been cleaned up.

- Regional Office employees that copy the project locally should browse to the Y:drive PIN folder and make the edits to the network copy of the Cleanlog.txt so that other employees can check the status of the project. If you make the comments to your local Cleanlog.txt file, no one else can see this but you.

Step Eighteen: Open and Flatten Contours and Points

Open the Contour.dgn file located in the \topo folder, select **Macros>Flatten** from the *Main Menu.* Follow promts. Close MicroStation. Repeat for the Points.dgn file.

Step Ninteen: Repeat for Mapping.dgn (Projects that Utilizes Aerial Mapping)

Cleanup Mapping.dgn

If the Survey/MSTA folder has a **3DmappingMMDDYY.dgn,** you must clean up this file as well. Follow the same steps as outlined in the "Initial Topography Cleanup" section. Substitute **mapping.dgn** where it asks for the **topo.dgn.**

- Some older projects may have mapping in a separate folder. Files may not follow the naming described in this manual. Contact CADD Support for assistance.

Merge Mapping.dgn into Topo.dgn

Once the **Mapping.dgn** cleanup has been completed, open the **topo.dgn** file from the Topo folder. Select **File>Reference (DOT)>Attach** from the *Main Menu* and select the **Mapping.dgn**, browsing to the **Topo** folder if necessary. Click OK. It is not necessary to enter a *Logical or Description.* Attach by *Coincident World* method.

From the *Reference File* dialog, select the **Mapping.dgn** file. Then select **Tools>Merge Into Master.** Following the prompts, click in your view window. This dialog will come up (Figure 3-20) warning you that you are about to merge the Reference file into your current file.

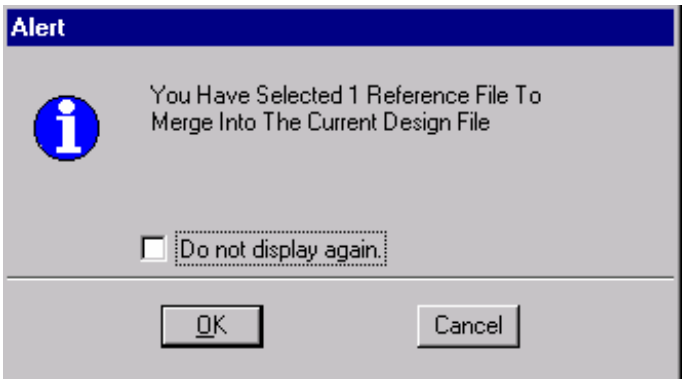


Figure 3-20: Merging Reference File Alert

If everything looks good, click OK to proceed.

Hit *Refresh.*

INITIAL TEXT CLEANUP

Determine Direction of Proposed Alignment

This step is very important. If you haven't already, take necessary steps to determine who the Project Manager is for the project. Ask which direction that they anticipate the alignment to be laid out. If this is unknown, **do not** cleanup this drawing until it's been established.

Step One: Open the Text.dgn (From the Topo Folder)

Open MicroStation by clicking the Icon on your desktop. When the *MicroStation Manager* window appears, pick your project from the *Project* pull down. Browse to the **Topo** directory by double clicking your project number's decimal folder (i.e. pin\9045**"00"** folder), then double clicking the "Topo" folder.

- If the project pull down does not take you to your project, contact your CADD Support personnel.

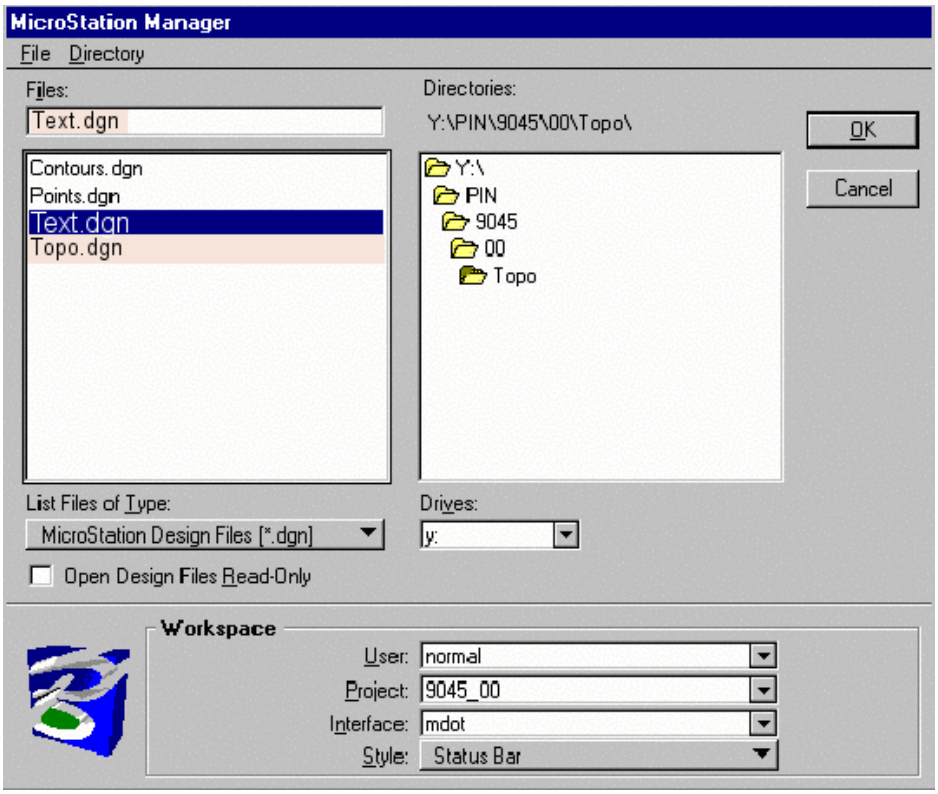


Figure 3-21: Select Text in the MicroStation Manager dialog

You should see four or five drawings on the left. Select **text.dgn** and click **OK** (Figure 3-21). Once the file is open, click *Fit View* from *Window1's* view control toolbar. Close *Window2, Window3and Window4* if necessary and maximize *Window1*.

ⓘ ***If the Topo directory is empty, go back to Step Three and copy files.***

Step Two: Reference Topo.dgn and Mapping.dgn (If exists)

Select **File > Reference(DOT)>Attach**. Browse to the **Topo** folder if necessary and select **topo.dgn.** It's not necessary to enter a *Logical* or *Description.* Attach by *Coincident World* method. Repeat for **Mapping.dgn.**

Step Three: Flatten the Drawing

From the *Main Menu,* select **Macros>Flatten**. Follow prompts.

Step Four: Adjusting Text Height, Width and Line Spacing

Introduction

Depending on whether or not you project is metric or U.S. Customary or when the PIN was created, you may or may not have to adjust the height, width and line spacing. Go through the following steps to see if your text requires adjusting.

- Experienced users can use the *Analyze Element* tool and click on the *Details* tab to compare text sizes from to the Nominal Text sizes below.

Part One: Select Text

From the Main Menu select **Edit>Select All.** All of the text should highlight.

Part Two: Set the Scale

Right Click the *Settings Manager* and select **Category Scale.** Pick the plot scale that was intended for the project (i.e. 1 in. = 25 ft. or 1 in. = 50 ft. (1:250 or 1:500 metric)).

Part Three: Select Text from Settings Manager

From the **Survey** *Settings Manager* select **Text(Misc)>Standard Text (Normal).**

Part Four: Change Text Attributes

From the *Main Menu,* select **Text>Update Text.** Uncheck *Justification* in the list of attributes.

- It may be necessary to expand the list by clicking on the "Expand" down arrow in the *Tool Settings* window.

Part Five: Click to Accept the Command

Zoom in on a piece of text. Click in *Window 1* to accept the command and the current selection set. All of the text will change size if the change is necessary. If the text doesn't change size, a change wasn't needed. Use *Undo* and *Re-do* to look at the difference if there is any.

- The Line Spacing is an attribute that cannot be preset. If a user wants to stack text (multi-line) this setting must be adjusted.

Part Six: Select None

From the Main Menu, select **Edit>Select None.**

Step Five: Rotating Text

General Information

Most text should be rotated to read from west to east (parallel to centerline), and/or from south to north (perpendicular to centerline). In tight situations, a 45-degree rotation is acceptable.

All rotated text, if perpendicular to the centerline, should be legible from the right side of the plan sheet. This enables a person to read the text from a stapled set of plans with the most ease.

Text on buildings should be rotated either parallel or perpendicular with the building face.

Text for drives should run parallel to the drive unless it identifies a wide parking area/lot.

Global vs. Individual Rotation Introduction

All text in the text.dgn comes in at the same angle.

One pass **Globally,** using selection sets through the entire project will align the majority of text elements correctly. The text that it doesn't correct will most likely be an even 90-degree increment away from being correct.

ⓘ ***This method works best on the straight portions of your project. Areas on a curve can be dealt with by using smaller selection sets or simply by using individual rotation methods.***

Utilize the **Individual rotate** command for text blocks that need final tweaking. Intersections of Side Roads require a bit more attention in this respect.

Global Rotation: Select Text Blocks to Rotate

Identify a portion of your project that is fairly straight. If your project is one big curve use small selection sets so that global rotation will be effective.

Using the Power Selector - The power selector works well for selecting single or multiple text blocks because of the various selection methods. You can also add and subtract from your selection set easily. Choose *Shape* method and choose the "**+**" in the mode field (Figure 3-22).

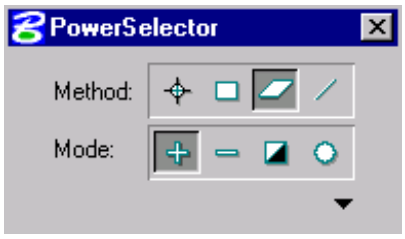


Figure 3-22: Power Selector set to shape

Left click to form a shape around the text blocks you want to rotate, returning back to the beginning point to close the shape. You should see them highlight.

Click the **Rotate** tool from the Survey Editors tool box or the Main tool frame. In the Tools Setting box, click the down arrow to *Show Extended Information (*Figure 3-23*).* Place a checkmark in the *About Element Center* box of the dialog box (Figure 3-24).

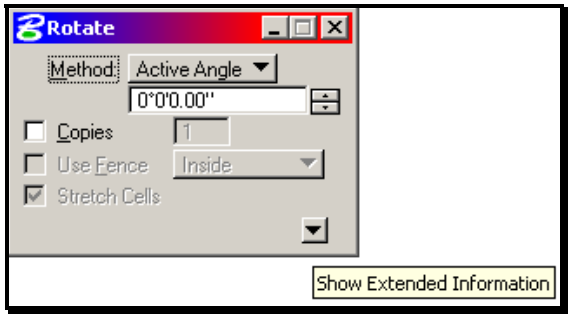


Figure 3-23: Rotate Element's Show Extended Information button

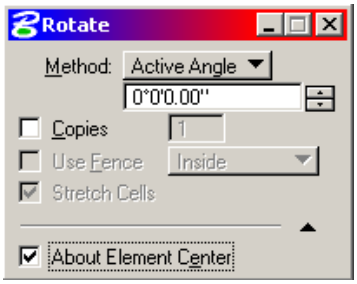


Figure 3-24: Rotate Element's About Element Center box

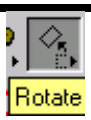
Active Angle method: Take a rough guess of what the angle would be between the text block and the roadway. In the **angle** field, type in the angle. If you don't have any idea what the angle might be, try using a 5-degree rotation and click multiple times on the screen to continue rotating this amount. (Type in a "-" for a clockwise rotation.)

2 Points method: Click on the screen and you are dynamically rotating the text blocks around their origins. Move your cursor around the *AccuDraw's* compass until the majority is rotated correctly. Click to *Accept* this rotation. Right Click to stop rotating.

- To create new selection sets, hit your "spacebar" to clear the current selection set (while focus is in *Power Selector* dialog) and place a shape around the new set of text blocks.
- Refer to page 2-28 for more information on the *Power Selector* tool.

Individual Rotation

To perform individual rotations, rotate the text block around the point established by the Survey Crew, which is also the center/origin point of the cell it identifies.



Click the **Rotate** tool from the Survey Editors tool box or Main tool frame. In the Tools Setting dialog, click the down arrow to *Show Extended Information.* Place a checkmark in the *About Element Center* box of the dialog box. Click near the text block (the actual pivot is set to the text block's origin based on the tool setting). The text block will rotate dynamically as you move the mouse around *AccuDraw's* compass. Left click again to define the amount of rotation. Right Click to stop rotating the text block.

Step Six: Moving Text

After text is rotated, it may also require moving. Text should be kept out of and away from roadway as much as possible. Use common sense when moving items nearest the cell that they describe so the plan "looks good". Use the *Move Element* tool to move single text blocks.

- Snapping to text (middle mouse) will show you what the text is describing. This works well in areas where text is on top of text making it difficult to distinguish. Identify what the text is describing and move it to a better location until all elements are clearly identified.

Step Seven: Editing Text (Optional)

Text for similar elements should be consistent. Examples of inconsistent labels are GRAV.DR., GR.DRIVE, GRAVEL DR.. Adjust these to read GRAVEL DRIVE. (If in a tight area, abbreviations may be unavoidable.) Use the *Edit Text* tool to do this. Click the tool and then identify the text. Click once more to *Accept* and the text will appear in the **Text Editor** window. Make your changes and hit **Apply**. Right click to stop editing *that* text block.

Abbreviations or making the text appear on two lines may be necessary in order to squeeze long descriptions in highly congested areas. Like items close to each other, may be labeled once. To do this, edit the text using the *Edit Text* tool. Click on the text, once more to *Accept* and it should appear in the **Text Editor** window. Make your changes and hit **Apply** (i.e. 5 – 400 to 500 mm CEDAR SHRUBS).

Step Eight: Labeling With Arrows (Optional)

It may be necessary to create an arrow line pointing to the cell it represents. Here are a few steps to accomplish this.

Part One: Select Arrow Line

Select **Text (Misc)>Arrow Lines** from the *Settings Manager*.

Part Two: Make Lines

Click to the left of the text block with the left mouse button. Type RQ (Rotate Quick) and align your *AccuDraw* axis along the text block and click your left mouse button. Enter the

distance that you want your line to be from the text, 3 feet (1.0 m) is usually good and click your left mouse button to *Accept*. Point to the cell that you are annotating (Figure 3-25). Do the same for the other side if necessary.

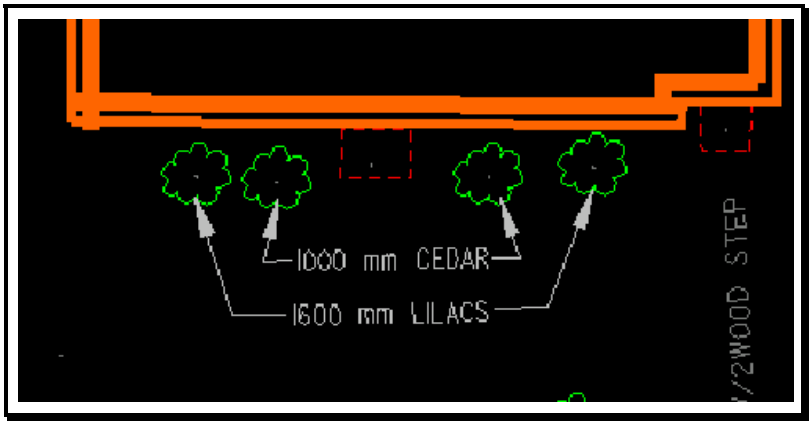


Figure 3-25: Example of annotating with arrows

Step Nine: Find and Replace Text (Metric Projects Only)

Change the units from displaying an upper case 'MM' to a lower case 'mm' as suggested by current Metric standards. Open the **Edit > Find And Replace Text** dialog box. By using certain combinations of strings, you can change all of them globally. Find "0MM". Replace with "0 mm" (gets all numbers ending with a zero). Find "_MM". Replace with "_mm". In this example, the "_" symbol represents a space. This should change them all. Do the same process to change from "M" (meters) to "m".

- Some words will have two 'M's in them. Commercial is one. Using the above combinations will not affect these type words.

Step Ten: Adjust and Save Changes (Courtesy To Others)

Rotate Window 1 back to a top view. Click on *Rotate View* and set the *Method* to **Top**. Click in the view to accept the new rotation. Select **File>Save Settings.**

- If Save Settings is grayed out, this means that your current preferences are to save settings on exit. It will accomplish what this step is intended to do.

Step Eleven: Add Note to Cleanlog.txt File! (Courtesy To Others)

Make a comment to the Cleanlog.txt to let people know that the text has been cleaned up.

- Regional Office employees that copy the project locally should browse to the Y:drive PIN folder and make the edits to the network copy of the Cleanlog.txt so that other employees can check the status of the project. If you make the comments to your local Cleanlog.txt file, no one else can see this but you.

ADDITIONAL TOPOGRAPHY CLEANUP

Quick Punch List

- Copy topoadd# files from Survey/MSTA to Topo folder
- Rename files (remove the "Orig")
- Cleanup Files
- Flatten Files
- Blend the two Files
- Merge file into topo.dgn
- Add note to Cleanlog.txt file

♫ This punch list is to give an overview of what is to be done with additional topograph files. If the topoadds are needed prior to the cleanup, copy the files to the topo folder temporarily.

♫ Supply your topoadd number where you see a "#" sign.

Step One: Copy/Rename Origtopoadd#, Origtextadd#, Contours and Points

Copy Origtopoadd#, Origtextadd#, Contours and Points from the **Survey\Msta** folder into the **Topo** folder using Windows Explorer. You will be prompted to overwrite Contours and Points. Say **Yes.**

Select Origtextadd#.dgn. From the Explorers Menu, select **File>Rename.** Remove the Orig from the file name. Repeat for Origtopoadd#.dgn (i.e. **topoadd1.dgn** and **textadd1.dgn.)**

✓ *Refer to Step Three: Copy Files from Survey\Msta to Topo Folder in the Initial Topography Cleanup portion of this manual for more detailed instruction if necessary.*

♫ If there are more than one 3DtopoMMDDYY.dgn files, this indicates that there has been topoadd's done for this project. If no cleanup has been done on the whole project, cleanup up the latest dated file and you will be taking care of every topoadd, including the original topo. All "ground survey" topography is displayed in the latest 3DtopoMMDDYY.dgn file. Always check the Cleanlog.txt file to see what has been cleaned up.

♫ The original 3DmappingMMDDYY.dgn file contains all Aerial Mapping data. No additional Aerial mapping is ever done. If there is more than one 3DmappingMMDDYY.dgn, it means that additional ground survey has been taken in the form of a Origtopoadd#.dgn. Survey re-creates a 3DmappingMMDDYY.dgn to indicate where the ground survey fits in. This area(s) is encompassed by a boundary string.

Step Two: Add Note to Cleanlog.txt File!

As a courtesy to others, always add a note to the **Cleanlog.txt** file located in the **Topo**

directory as progress is made during the cleanup process. Here are a few examples of informative cleanup notes.

03/04/02 John Doe - Started **Topoadd#.dgn** cleanup.

03/07/02 John Doe - Finished **Topoadd#.dgn** cleanup.

03/07/02 John Doe - Started/Finished **Textadd#.dgn** cleanup.

- Regional Office employees that copy the project locally should browse to the Y:drive PIN folder and make the edits to the network copy of the Cleanlog.txt so that other employees can check the status of the project. If you make the comments to your local Cleanlog.txt file, no one else can see this but you.

Step Three: Open Topoadd#

Click the MicroStation icon on your desktop and pick your *Project* from the pull down. Browse to the **Topo** folder. Select **Topoadd#.dgn** and click OK.

- If the project pull down does not take you to your project, contact your CADD Support personnel.

Step Four: Attach Reference Files

Select **File>Reference(DOT)>Attach** from the Main Menu. Select the **Textadd#.dgn,** browsing to the **Topo** folder if necessary. Click OK. It is not necessary to enter a *Logical* name or description for any attachments to this file. Attach by *Coincident World* method. Repeat this process for the **Topo.dgn** and **Text.dgn** drawings. Shut off the display of **Topo** and **Text** unless you need to see the “big” picture.

Step Five: Refer to Step 6 through Step 18 in the “Initial Topo Cleanup” portion of this manual

Follow the same steps that were followed when doing an Initial topo cleanup. Many steps may be skipped depending on the type of information in the Topoadd# file.

ADDITIONAL TEXT CLEANUP

Determine Direction of Proposed Alignment

It should be apparent which way alignment is going to be laid out from the current Topo and Text drawings. Rotate accordingly.

Step One: Open the Textadd#.dgn (From the Topo Folder)

Step Two: Reference Topoadd#.dgn

Select **File > Reference(DOT)>Attach**. Browse to the **Topo** folder if necessary and select **Topoadd#.dgn.** It's not necessary to enter a *Logical* or *Description.* Attach by *Coincident World* method. Repeat this process for the **Topo.dgn** and **Text.dgn** drawings. Shut off the display of **Topo** and **Text** unless you need to see the "big" picture.

Step Three: Refer to Step 3 through Step 11 in the "Initial Text Cleanup" portion of this manual

Follow the same steps that were followed when doing an Initial text cleanup.

BLENDING NEW TOPO AND TEXT WITH OLD

General Information – Blending Tips

Topoadd1 and Textadd1 features take precedence in the Topo file, therefore, most of the work will be done in the **topo.dgn** file. Edit topo.dgn and text.dgn to accommodate the new topography (topoadd1.dgn and textadd1.dgn) to be merged.

Use a combination of MicroStation's tools to accomplish the task of "blending" the updated Topography with the **Topo.dgn** and the **Text.dgn** file. The areas of additional survey should stand out from the previous surveys if you use *Level Symbology*.

Aerial Mapping Projects

Part One: Open Topo.dgn – Attach Topoadd#

Open the **Topo.dgn.** Select **File>Reference (DOT)>Attach** from the *Main Menu.* Browse to the **Topo** folder if necessary and select **Topoadd#.dgn.** It's not necessary to enter a *Logical* or *Description.* Attach by *Coincident World* method.The **Topoadd#.dgn** takes precedence in the drawing. This will replace any Mapping Survey elements that exist in the topo.dgn. There should be a boundary element around the additional ground survey elements.

Part Two: Place Fence By Element

Select the *Place Fence* tool. Change *Fence Type* to **Element.** Set *Fence Mode* to **Clip.** Click on the boundary element. The element will highlight indicating the fence was placed.

Part Three: Delete fence Contents

Select the *Delete Fence Contents* tool. Set the *Fence Mode* to **Clip.** Click in your view to *Accept* the command. This should remove the old elements that were picked up through Aerial Mapping methods to make room for the newly surveyed information.

Adjust Colors for Easy Editing - Level Symbology (Optional)

Adjusting colors of the drawings will make it easier to distinguish the old Topography and the updated Topography. Adjust colors to your personal preference. You may want to follow the same steps outlined below for the topo.dgn, text.dgn, and the Topoadd#.dgn, so while in that drawing, your colors are the same throughout all of the files you need to edit. The example below is adjustments to make while in the topo.dgn.

Part One: Open Topo.dgn and Attach Topoadd#.dgn and Textadd#.dgn

Open **topo.dgn** from the \topo folder. Select **File > Reference(DOT)>Attach**. Browse to

the **Topo** folder if necessary and select **Topoadd#.dgn.** It's not necessary to enter a *Logical* or *Description.* Attach by *Coincident World* method. Repeat this process for the **Textadd#.dgn** drawing.

Part Two: Open Topo and Turn On Level Symbology

From the Main Menu, select **Settings>View Attributes (Ctrl + B).**

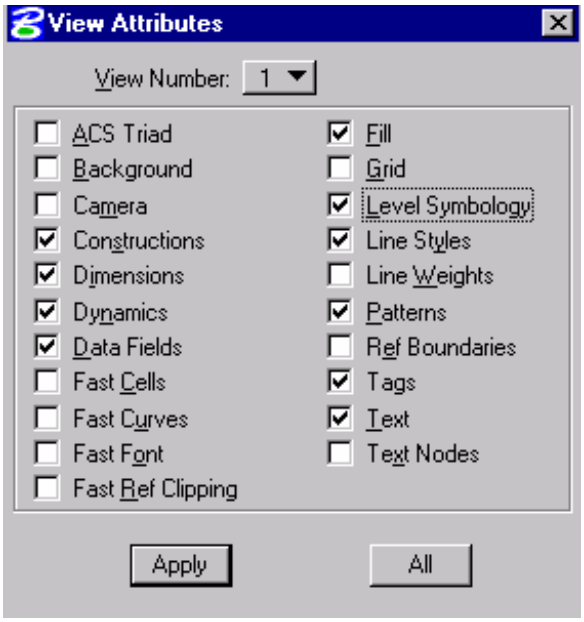


Figure 3-26: View Attributes using Level Symbology

Place a checkmark in the *Level Symbology* box (Figure 3-26). Hit **Apply.**

Part Three: Assign Colors to the Active Design File (i.e. Topo)

Open the **Settings>Level>Manager** dialog from the Main Menu.

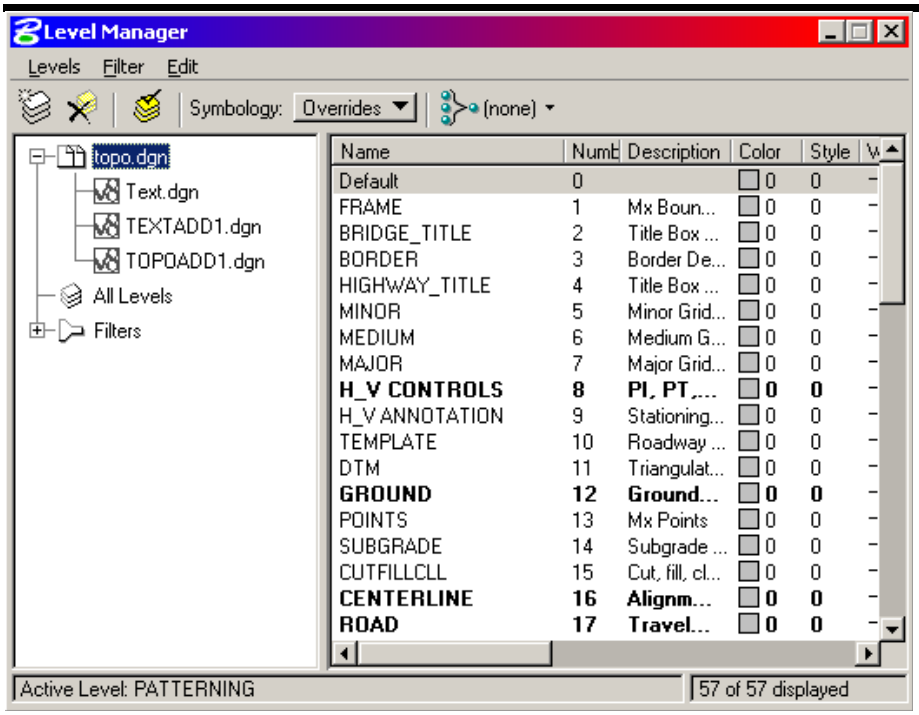


Figure 3-27: Level Manager dialog

In the leftmost window, click to highlight *Topo* (Figure 3-27) which is the active file you are in. *Right-Click* in the rightmost window and pick *Select All* (Figure 3-28). All *Levels* will highlight (Figure 3-29).

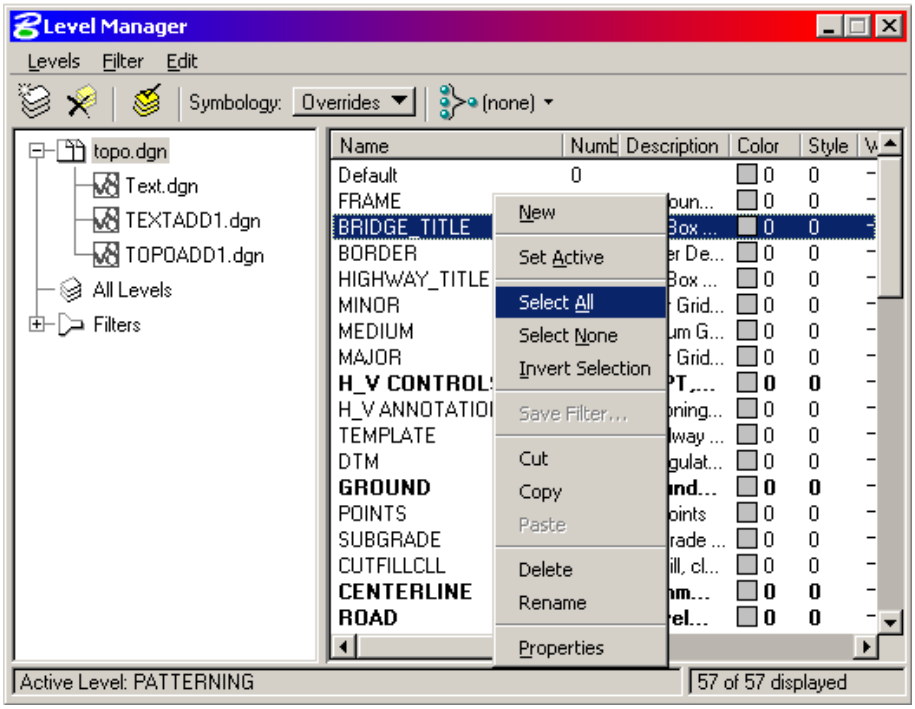


Figure 3-28: Right Click and select Select All

Right-Click again and select *Properties (*Figure 3-29*).*

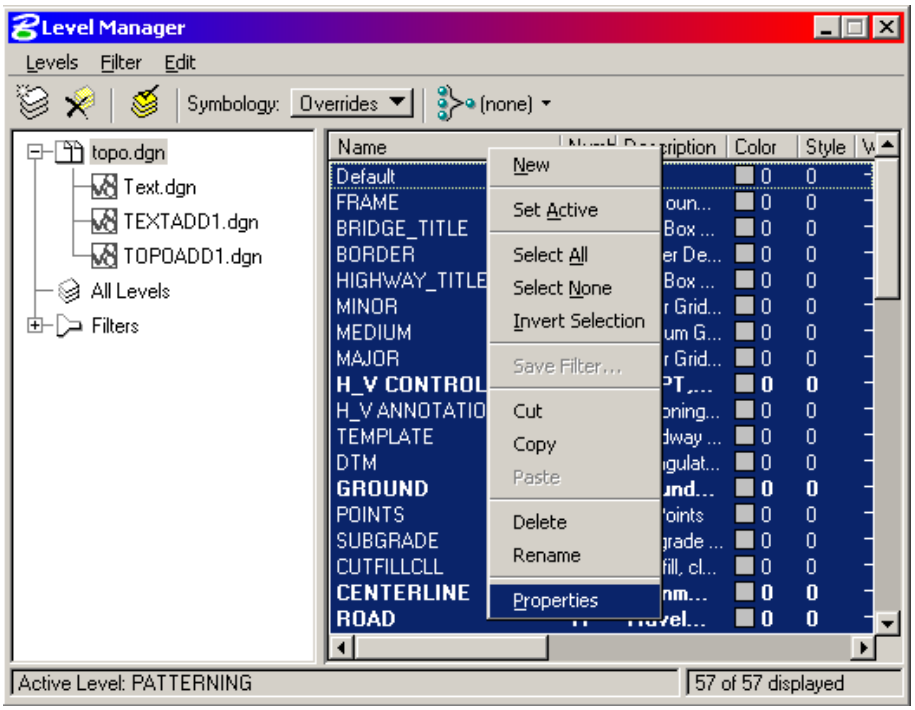


Figure 3-29: Right Click and select Properties

In the *Level Properties* dialog, adjust the *Symbology Overrides* to look like the dialog in Figure 3-30. (Ignore the *Symbology: By Level* area.) Hit *OK*.

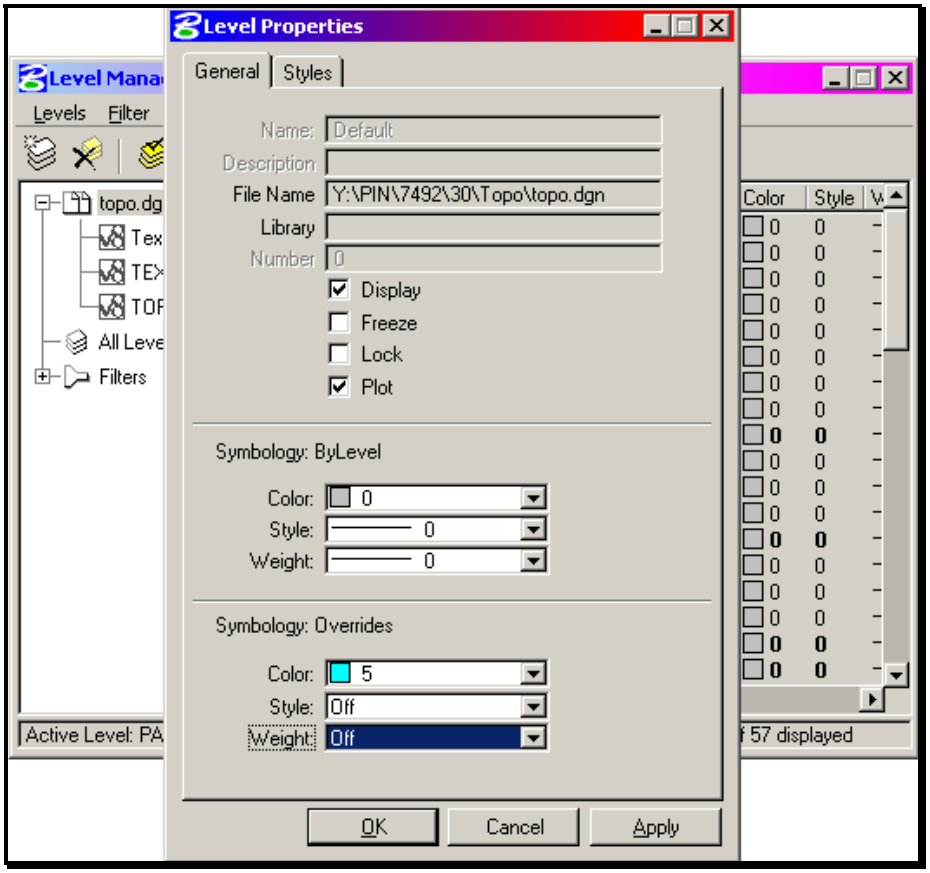


Figure 3-30: Symbology Overrides section of Level Properties

Part Four: Repeat for Text.dgn

Repeat the same process for the text.dgn. Be sure to select the **text.dgn** on the left side of the dialog to display its levels. If you don't see the text drawing, expand the tree by clicking the "+" sign next to topo.dgn. Use the same color you used for topo.

Part Five: Assign Colors to the Topoadd#

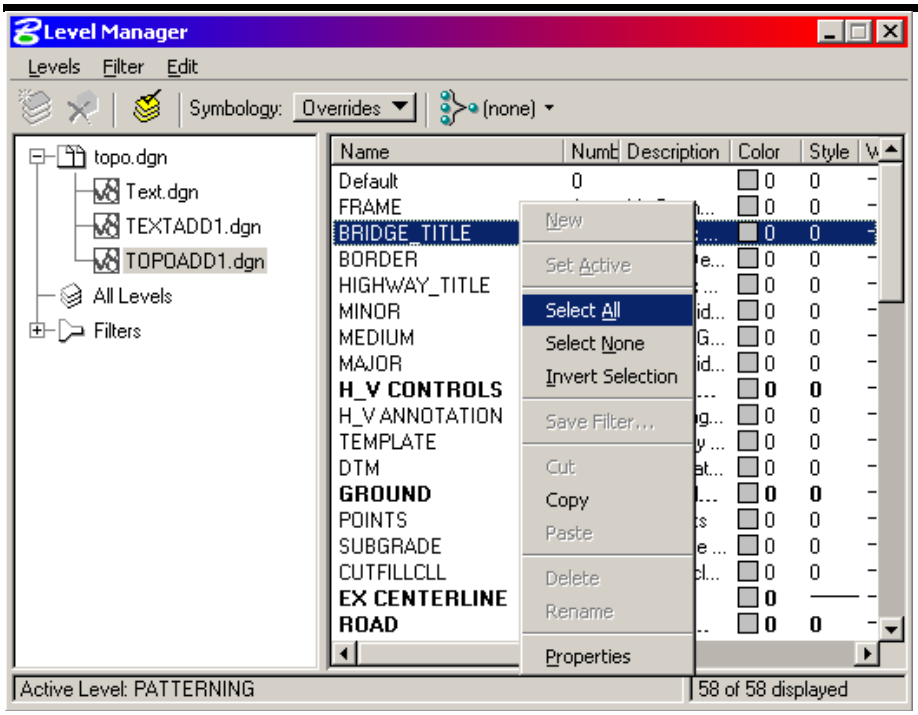


Figure 3-31: Right Click and pick Select All

In the leftmost window, click to highlight *Topoadd1.dgn. Right-Click* in the rightmost window and pick *select all* (Figure 3-31). All *Levels* will highlight.

Right-Click again and select *Properties.*

In the *Level Properties* dialog, adjust the *Symbology Overrides* to look like the dialog in Figure 3-32. (Ignore the *Symbology: By Level* area.) Hit *OK.*

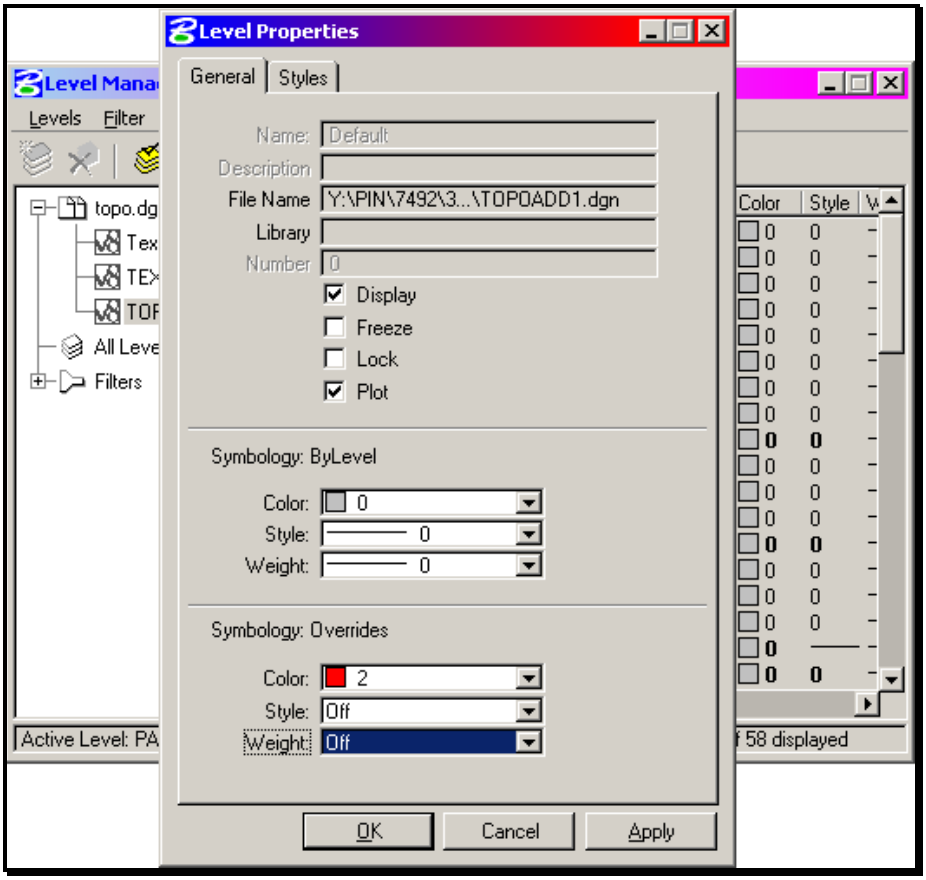


Figure 3-32: Symbology Overrides section of Level Properties

Part Six: Repeat for Textadd#.dgn

Part Seven: Refresh View

Click on the paintbrush in the *View Controls* tools to *Refresh* the view.

Part Eight: Save Settings

From the Main Menu, select **File>Save Settings.**

File Swapping (Handy Tip - Optional)

While editing the **Topo** file, you may need to swap back and forth between it and the **Text.dgn** and/or the **Topoadd1.dgn**. Try using **File>Reference(DOT)>HotSwap.** Follow prompts as the macro takes you to the element you select in any of the reference files you have attached. This gives you the capability to edit it. Also, use **File>2 (Alt+F+2)** to swap to the file you just came from.

Highlite Display of Reference Files (Optional)

In the *Reference File* dialog, set your *Hilte Mode* to **Hilite.** Select a reference file to hilite it.

Update the Reference File Sequence (Optional)

Some people may want to change which file is displayed on top of which file. In the *Reference File* dialog, select **Settings>Update Sequence.** This determines which file is displayed first.

MERGING NEW TOPO AND TEXT WITH OLD

Step One: Open Topo.dgn and Attach Topoadd#.dgn

Open **topo.dgn** from the \topo folder. Select **File > Reference(DOT)>Attach**. Browse to the **Topo** folder if necessary and select **Topoadd#.dgn.** It's not necessary to enter a *Logical* or *Description.* Attach by *Coincident World* method.

Step Two: Merging Topoadd# File

Part One: Select Reference File to Merge

Once the Topo file has been edited to allow for incorporation of the new topography, open the **File>Reference(DOT)>Dialog.**

From the *Reference File* dialog, select the **Topoadd#.dgn** file. Then select **Tools>Merge Into Master.** Following the prompts, click in your view window. This dialog will come up (Figure 3-33) warning you that you are about to merge the Reference file into your current file.

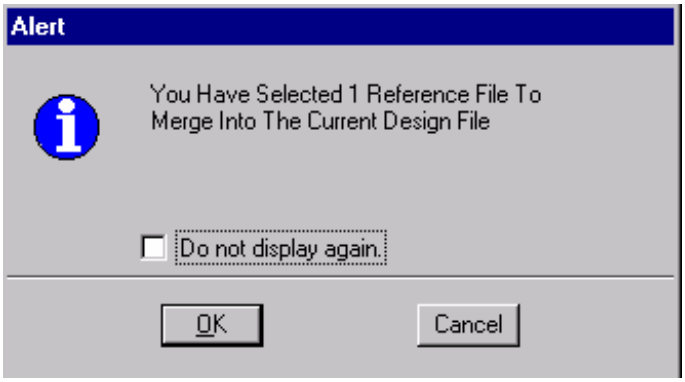


Figure 3-33: Merging Reference File Alert

If everything looks good, click OK to proceed.

Hit *Refresh.*

Part Two: Adjust and Save Changes

Rotate Window 1 back to a top view. Click on *Rotate View* and set the *Method* to **Top**. Click in the view to accept the new rotation.

If *Level Symbology* was used, select **Settings>View Attributes** and uncheck *Level Symbology*. Hit *Apply*. Close View Attributes Window.

Select **File>Save Settings**. Exit MicroStation.

Step Three: Open Text.dgn and Attach Textadd#.dgn

Open **text.dgn** from the topo folder. Select **File > Reference(DOT)>Attach**. Browse to the

Topo folder if necessary and select **Textadd#.dgn.** It's not necessary to enter a *Logical* or *Description.* Attach by *Coincident World* method.

Step Four: Merging Textadd# Files

Part One: Select Reference File to Merge

Once the Text file has been edited to allow for incorporation of the new text, open the **File>Reference(DOT)>Dialog.**

From the *Reference File* dialog, select the **Textadd#.dgn** file. Then select **Tools>Merge Into Master.** Following the prompts, click in your view window. This dialog will come up (Figure 3-34) warning you that you are about to merge the Reference file into your current file.

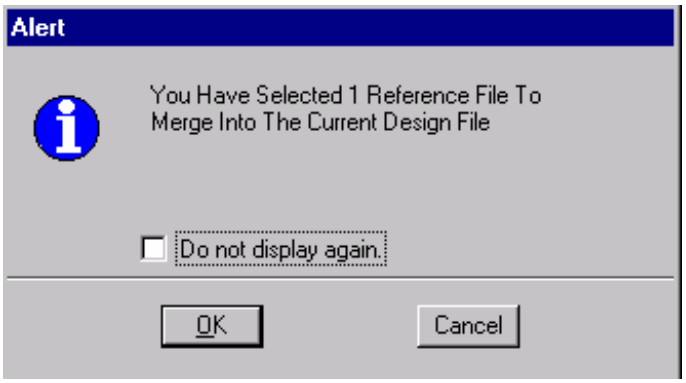


Figure 3-34: Merging Reference File Alert

If everything looks good, click OK to proceed.

Hit *Refresh.*

Part Two: Adjust and Save Changes

Rotate Window 1 back to a top view. Click on *Rotate View* and set the *Method* to **Top**. Click in the view to accept the new rotation.

If *Level Symbology* was used, select **Settings>View Attributes** and uncheck *Level Symbology*. Hit *Apply*. Close View Attributes Window.

Select **File>Save Settings**. Exit MicroStation.

Step Five: Moving Topoadd# and Textadd#

Using Windows Explorer, move the **Topoadd#.dgn** and the **Textadd#.dgn** files you just edited and merged from the **Topo** folder to the **ADDSDONE** folder located in your project's **Topo** folder.

- If Topoadd and Textadd drawings still exist in the **Topo** folder, this should tell a user that the clean up and merging is not yet complete.

Step Six: Add Note to Cleanlog.txt File!

Follow steps previously outlined in this document. Add a note saying that the two files have been merged.

- Regional employees make changes to this file on the Y: drive.

Step Seven: Copy Contents of Topo folder to Y:drive (Regional Employees)

If you are a Regional Employee or did the cleanup on your C: or D: drive, copy the contents of the Topo folder on your hard drive to the Y: drive Topo folder of your PIN number. As in similar procedures outlined in this manual, use the **Edit>Copy** and the **Edit>Paste** commands in Windows Explore.

WETLAND SURVEY CLEANUP

GENERAL INFORMATION

Standard Naming

The department has a standard naming convention for drawing files. The main reason for this is that many of our standard *plan view* type drawings for the department have the existing topography information referenced into them by default. This default reference only works when the files are named correctly and when they exist in the correct location.

Please follow procedures outlined below to adhere to these standards. The standard file names for existing Survey information residing in the **Topo** folder are Topo, Text, Contours, Points and **Wetlands**. These are the only five files that should permanently live in the **Topo** folder. Click this link for a complete list of MDOT Standard File Names or visit the website at www.maine.gov/mdot/cadd-support/microstation/std_filename.php.

Preserving Original Files

The Survey\Msta Folder is where the "Original" Survey files are stored. The folder will act as the topographical history for any given project. A user can open the folder and tell what was done for original survey, and all subsequent "survey adds". The folder is Read-Only to everyone except for the Survey Editors, therefore, MicroStation Survey clean up will be done in the **Topo** folder. If network speed is an issue because of proximity to the server, then copy the necessary files locally.

- ✓ *Regional Office users should refer to page12-1: Regional Workflow documentation for working with files locally. Please consult CADD Support for assistance.*

The End Result

The end result is to make the **wetlands.dgn**, which exist in the **Topo** folder, a combination of all wetlands lines and text for the project. This would leave no question as to which drawing needs to be referenced to display all of the cleaned up wetlands for the project.

INITIAL WETLANDS CLEANUP

Quick Punch List

- Copy files from Survey/MSTA to Topo folder
- Rename files
- Cleanup Files
- Flatten Files
- Add note to Cleanlog.txt file

♫ This punch list is to give an overview of what is to be done with original wetlands file. If the wetlands are needed prior to the cleanup, copy the file to the **Topo** folder and rename it.

Step One: Open Windows Explorer

Open Windows Explorer **(Start>Programs>Accessories>Windows Explorer)** and browse to your project on the y: drive.

♫ **Regional Offices**: Copy the project folder to your local C:\PIN or D:\PIN folder and continue with the steps in this document, substituting your C: or D: drive where the document says Y: drive.

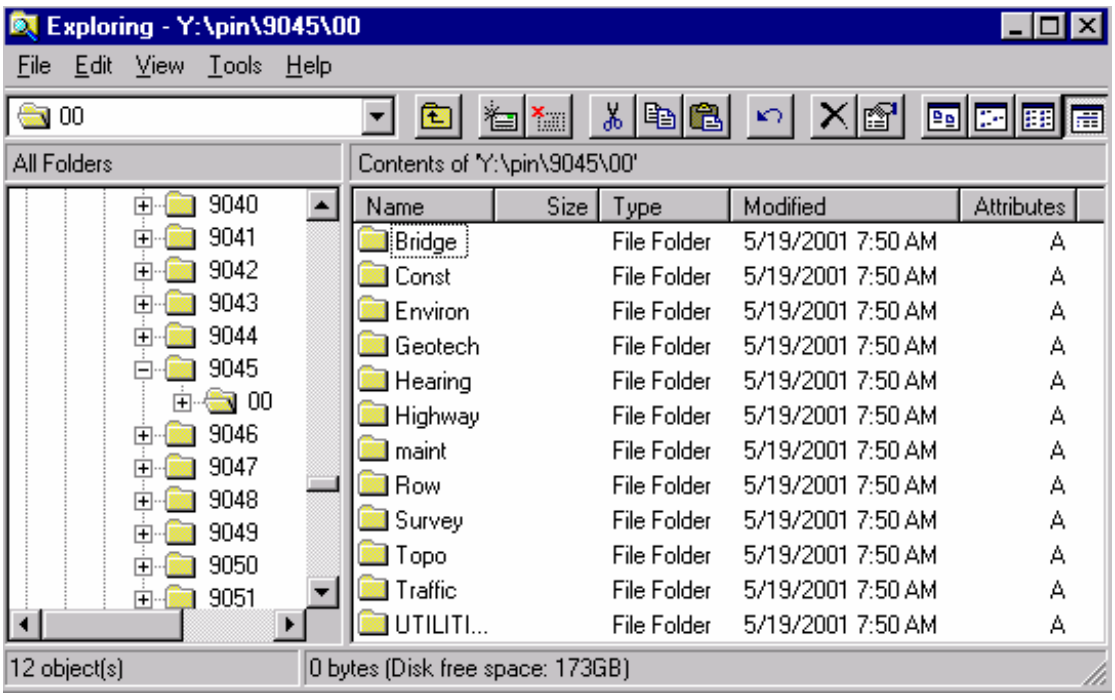


Figure 3-35: Browse to your PIN's topo folder

Step Two: Open the Topo Folder

In the example Figure 3-35, double click the Topo folder to display its contents. This folder should not have a **wetlands.dgn** file in it. If it does, skip the next step.

ⓘ ***If this folder already contains files, someone may have started Wetlands cleanup on this project. <u>Do not</u> overwrite this file with the next step. Open the Cleanlog.txt file to see if there are any "cleanup" notes. Skip to Step Four: Open MicroStation.***

Step Three: Open the Survey\MSTA Folder - Copy Files to Topo Folder

Part One: Browse to Survey\MSTA

With Windows Explorer still open, browse to the Survey\MSTA folder, displaying its contents in the rightmost window.

Part Two: Select Files

Select the **origwetlands.dgn.** If there have been additional wetland areas added to this project (i.e. wetlandsadd1.dgn) and no cleanup has been done on any of it, select these also.

Part Three: Copy

From the Main Menu, select **Edit>Copy** (Figure 3-36)**.**

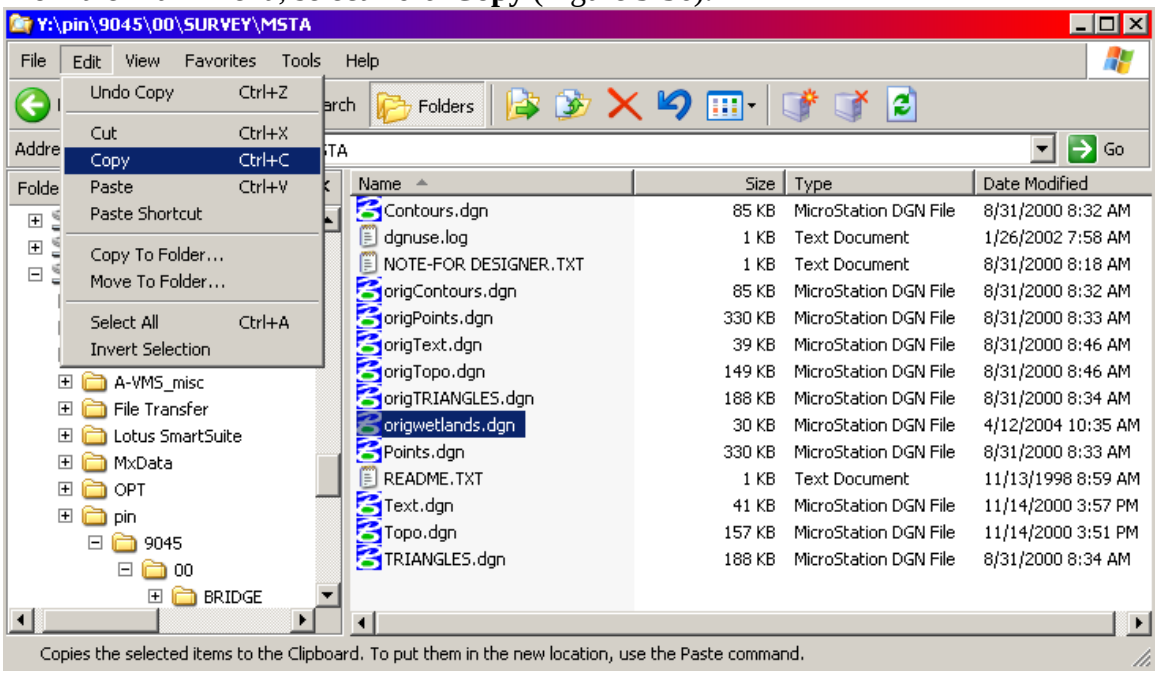


Figure 3-36: Copy origwetlands.dgn from the Survey\MSTA folder

Part Four: Paste

Click on the **Topo** folder. From the Main Menu select **Edit>Paste** (Figure 3-37)**.**

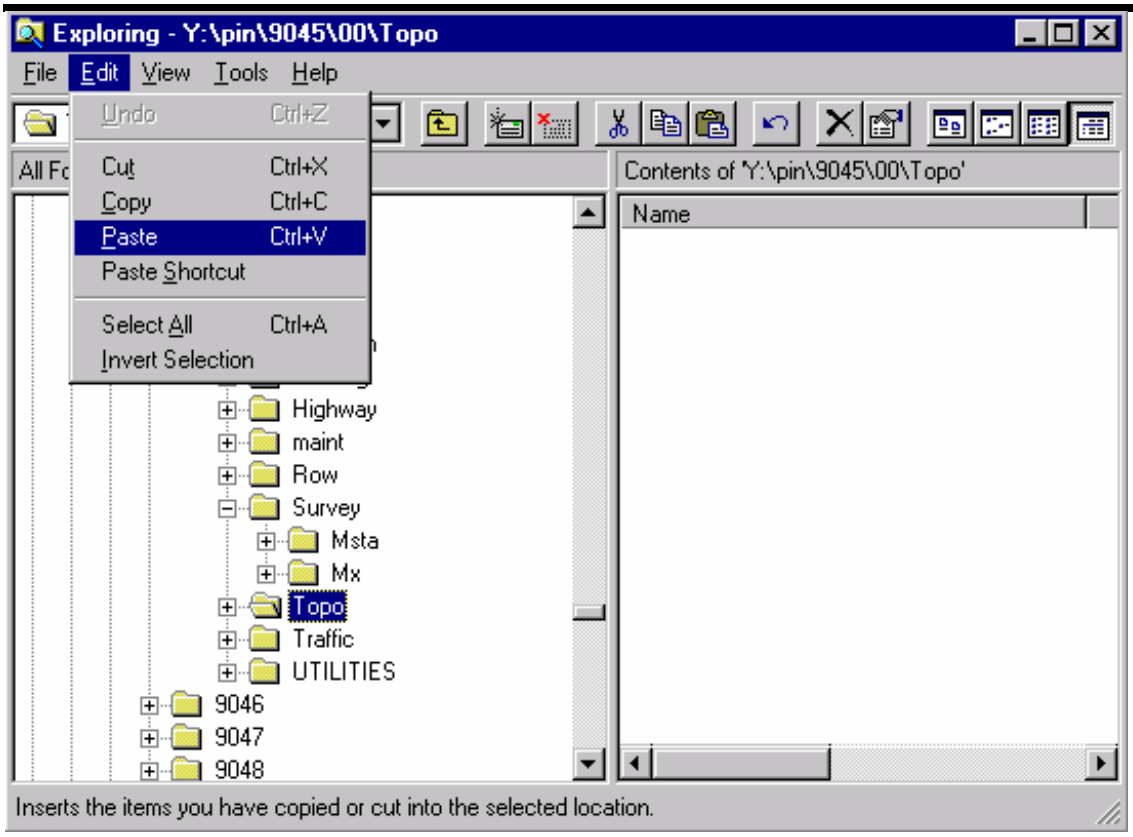


Figure 3-37: Paste origwetlands.dgn into the Topo folder

Part Five: Rename Origwetlands

Select **Origwetlands.dgn.** From the Main Manu, select **File>Rename.** Begin typing the new name, which is **wetlands.dgn.** Hit Enter to accept this name.

Part Six: Add Notes to Cleanlog.txt File!

As a courtesy to others, always add a note to the **Cleanlog.txt** file located in the **Topo** directory as progress is made during the cleanup process. Here are a few examples of informative cleanup notes.

03/04/02 John Doe - Started **wetlands.dgn** cleanup.

03/07/02 John Doe - Finished **wetlands.dgn** cleanup.

03/07/02 John Doe - Started/Finished **wetlands.dgn** cleanup.

- Regional Office employees that copy the project locally should browse to the Y:drive PIN folder and make the edits to the network copy of the Cleanlog.txt so that other employees can check the status of the project. If you make the comments to your local Cleanlog.txt file, no one else can see this but you unless you have your project Briefcased. In this case, be sure to synchronize this file also.

Step Four: Open MicroStation

Open MicroStation by clicking the Icon on your desktop. When the *MicroStation Manager* window appears, pick your project from the *Project* pull down. Browse to the **Topo** directory by double clicking your project number's decimal folder (i.e. pin\9045**"00"** folder), then double clicking the "Topo" folder.

- If the project pull down does not take you to your project, contact your CADD Support personnel.

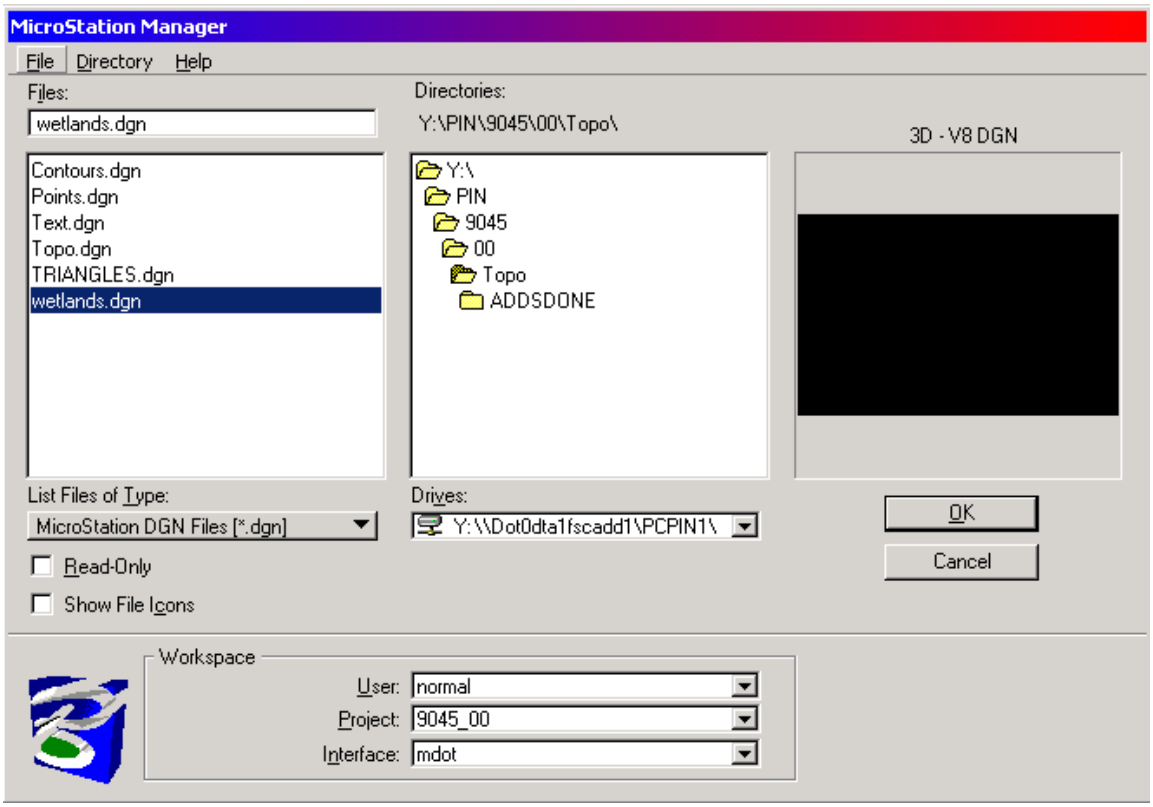


Figure 3-38: Select wetlands.dgn from your list of available files

You should see your drawing on the left. Select **wetlands.dgn** (Figure 3-38) and click **OK.** Once the file is open, click *Fit View* from *Window1's* view control toolbar. Close *Window2, Window3and Window4* if necessary and maximize *Window1.*

ⓘ ***If the Topo directory is empty, go back to Step Three and copy the file(s).***

Step Five: Attach Reference Files

The wetlands drawing doesn't have any reference files attached by default. Even though you can only edit one file at a time, it is helpful to have other drawings displayed. Select **File>Reference(DOT)>Attach** from the Main Menu. Select the **alignments.dgn,** browsing to the **Highway** or **Bridge\MSTA** folder if necessary. Click OK. It is not necessary to enter a *Logical or Description.* Attach by *Coincident World* method.

ⓘ ***If an alignments.dgn file is not found, take necessary steps to determine who the Project Manager is for the project. Ask which direction that they anticipate the alignment to be laid out. If this is unknown, do not cleanup this drawing until it's***

been established. This will determine which direction you adjust the linestyles for readability.

Step Six: Flatten Your Drawing

From the Main Menu, select **Macros>Flatten.** Click **OK** to accept "0.000" as the desired elevation to flatten to. Click anywhere in the view window to accept the command. Fit your view.

Step Seven: Adjust View and Save Settings (Optional)

Rotate the View Window

If your project is not running from left (West) to right (East), you may want to rotate your view window so that the majority of the project is horizontal across your screen. Select **Rotate View** from Window 1's *View Controls* (Figure 3-39).

Figure 3-39: Rotate View tool

When the *Rotate View* dialog appears, set method to 3 points. **First point (0/0),** click on screen where you want the lower left corner of the new window to be. **Second point (+X direction),** click where you'd like the bottom right corner of the view window to be. **Third point (+Y direction)**, click to define the top left corner of the view window (Figure 3-40).

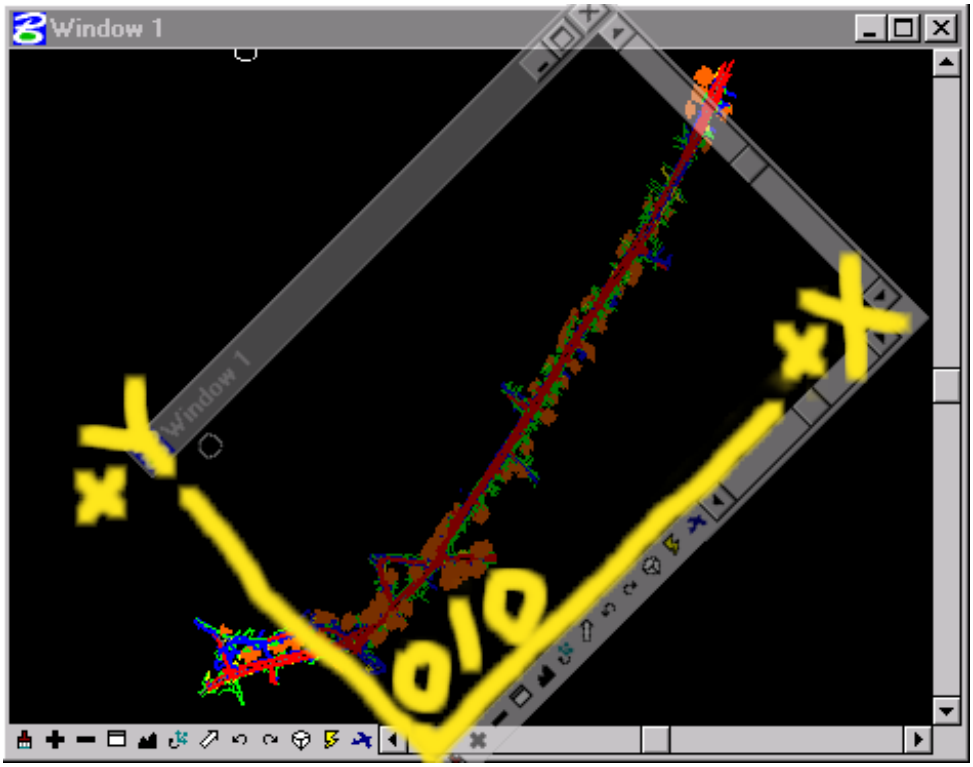


Figure 3-40: Rotating View with 3 point method

- Rotate View as often as necessary to get the majority of elements horizontal in your view. It is best **not** to snap to elements in your file while performing this command, unless you lock your "Z" prior to doing so **(Macros>Set/Lock Z).** A slightly skewed view may result if the 3 elements snapped to are at different elevations.

Graphic Group Unlock

Disable Graphic Groups by selecting **Settings>Locks>Graphic Groups** from the Main Menu or click the padlock on the status bar and click Graphic Groups to remove the checkmark.

Save Settings

Select **File>Save Settings** to save these settings as your default view for the file.

- If *Save Settings* is grayed out, this means that your current preferences are to save settings on exit. It will accomplish what this step is intended to do.

Step Eight: Reverse Wetland Linestyle Direction

Objective

Wetland lines have text imbedded in the linestyle. Ultimately, we want the text to be legible when the plans are cut into sheets. The text should be readable from left to right in accordance to the direction of the alignment.

Part One: Click the Reverse Direction Tool

The *Reverse Element Directions* tool is located in the *Modify* toolbox or from the *Main Menu* select **Qualities>Change>Directions**. Click the tool and follow the prompts in the bottom left status bar.

Part Two: Select the Line (Identify the Element)

Click on the line with a left mouse button. An arrowhead will appear displaying the current direction of the line.

Here is an example of a wetland line before clean up (Figure 3-41). Notice only part of the line reads correctly.

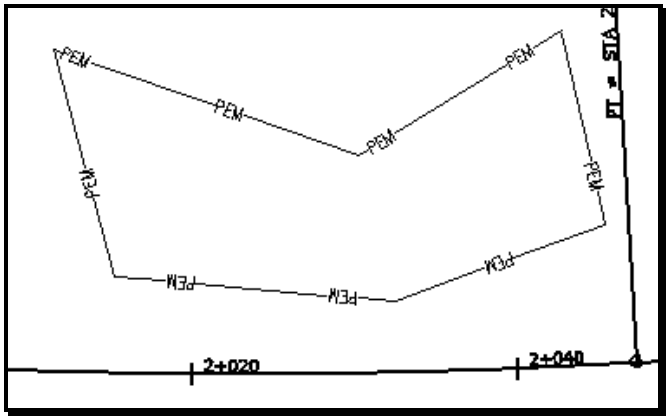


Figure 3-41: Example before reversing elements

Part Three: Define Start of the Line

The prompt is telling you to click anywhere near the opposite end of the line that needs reversing. This will make the other end the starting point. As long as the click on the screen is beyond the midpoint of the line, it will reverse directions.

Here is an example of a wetland line after clean up (Figure 3-42). Notice that all portions of the line read correctly. A partial delete had to be done to get accomplish this.

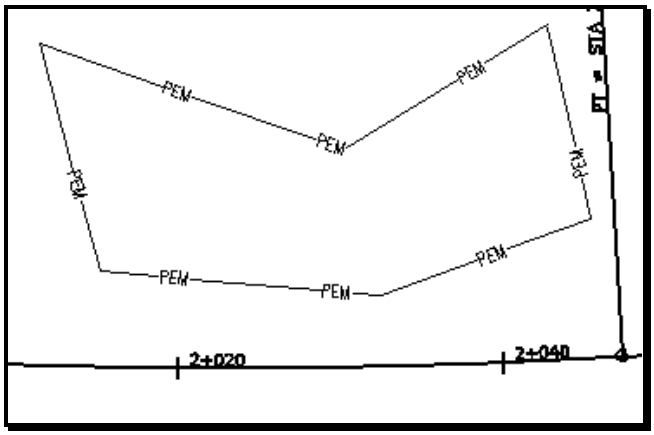


Figure 3-42: Example of a cleaned up wetland line

- You may have trouble reversing closed elements (shapes, blocks, etc.) and elements that go in both directions. Try deleting a small portion of the element using the *Delete Partial* tool which is located in the *Modify* toolbox. Click on the Partial Delete Tool. Click on a vertex of the string, then without moving the cursor away from the center of AccuDraw's compass, click where you originally clicked forming a partial deletion of the line that is unnoticeable.

Step Nine: Moving Vertices

You may need to adjust wetland lines because the line may not have been drawn correctly. Use the *Modify Element* tool to move a vertex from one location to another.

Step Ten: Changing Linestyle (if necessary)

If the wetland *Linestyle* is incorrect, select the line and select **Wetland/Rare Vegetation>?New Type?** from the *Settings Manager.* Select **Quality>Change>Symbology** from the main menu and click in the view window.

Step Eleven: Add Wetland Lines (if necessary)

Use the *Settings Manager* to place new wetland lines if necessary. Select **Wetland/Rare Vegetation>?Type?** from the *Settings Manager.* Draw the line using *AccuDraws* abilities. If there are Station and offsets available, consider using the the *Point Along* macro.

✓ *Refer to page 2-81 for instructions for entering station and offset values for plotting wetland lines manually.*

Step Ten: Adjusting Text Height, Width and Line Spacing

Introduction

Depending on whether or not you project is metric or U.S. Customary or when the PIN was created, you may or may not have to adjust the height, width and line spacing. Go through the following steps to see if your text requires adjusting.

♫ Experienced users can use the *Analyze Element* tool and click on the *Details* tab to compare text sizes from to the Nominal Text sizes below.

Part One: Select Text

From the Main Menu select **Edit>Select All.** All of the text should highlight.

Part Two: Set the Scale

Right Click the *Settings Manager* and select **Category Scale.** Pick the plot scale that was intended for the project (i.e. 1 in. = 25 ft. or 1 in. = 50 ft. (1:250 or 1:500 metric)).

Part Three: Select Text from Settings Manager

From the **Survey** *Settings Manager* select **Text(Misc)>Standard Text (Normal).**

Part Four: Change Text Attributes

From the *Main Menu,* select **Text>Update Text.** Uncheck *Justification* in the list of attributes.

♫ It may be necessary to expand the list by clicking on the "Expand" down arrow in the *Tool Settings* window.

Part Five: Click to Accept the Command

Zoom in on a piece of text. Click in *Window 1* to accept the command and the current selection set. All of the text will change size if the change is necessary. If the text doesn't

change size, a change wasn't needed. Use *Undo* and *Re-do* to look at the difference if there is any.

- The Line Spacing is an attribute that cannot be preset. If a user wants to stack text (multi-line) this setting must be adjusted.

Part Six: Select None

From the Main Menu, select **Edit>Select None.**

Step Eleven: Rotating Text

General Information

It is up to the discretion of the individual or their unit as to rotate the wetland flags or not. Since other units will most likely shut off the wetland "flag" text, it's important to know that you are doing this for your biologist's checking purposes only.

Most text should be rotated to read from west to east across your screen (parallel to centerline), and/or from south to north (perpendicular to centerline). In tight situations, a 45-degree rotation is acceptable.

All rotated text, if perpendicular to the centerline, should be legible from the right side of the plan sheet. This enables a person to read the text from a stapled set of plans with the most ease.

Global vs. Individual Rotation Introduction

All text in the wetlands.dgn comes in at the same angle.

One pass **Globally,** using selection sets through the entire project will align the majority of text elements correctly. The text that it doesn't correct will most likely be an even 90-degree increment away from being correct.

ⓘ ***This method works best on the straight portions of your project. Areas on a curve can be dealt with by using smaller selection sets or simply by using individual rotation methods.***

Utilize the **Individual rotate** command for text blocks that need final tweaking. Intersections of Side Roads require a bit more attention in this respect.

Global Rotation: Select Text Blocks to Rotate

Identify a portion of your project that is fairly straight. If your project is one big curve use small selection sets so that global rotation will be effective.

Using the Power Selector - The *Power Selector* works well for selecting single or multiple text blocks because of the various selection methods. You can also add and subtract from your selection set easily. Choose *Shape* method and choose the "**+**" in the mode field (Figure 3-43).

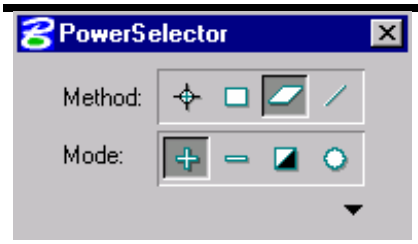


Figure 3-43: Power Selector set to shape

Left click to form a shape around the text blocks you want to rotate, returning back to the beginning point to close the shape. You should see them highlight.

Click the **Rotate** tool from *Main* tool frame. In the Tools Setting box, click the down arrow to *Show Extended Information (*Figure 3-44*).* Place a checkmark in the *About Element Center* box of the dialog box (Figure 3-45).

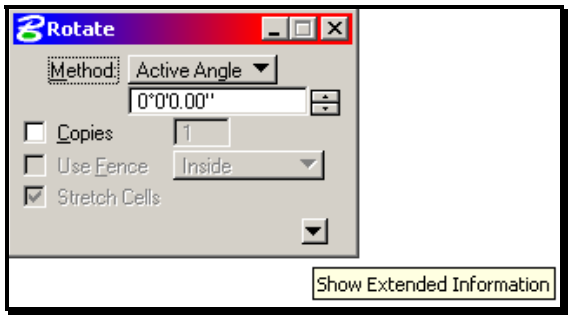


Figure 3-44: Rotate Element's Show Extended Information button

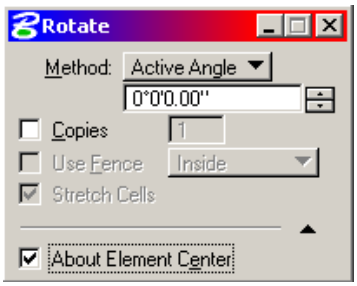


Figure 3-45: Rotate Element's About Element Center box

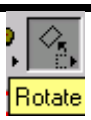
Set *Method* to **2 Points.** Click on the screen and you are dynamically rotating the text blocks around their origins. Move your cursor around the *AccuDraw's* compass until the majority is rotated correctly. Click to *Accept* this rotation. Right Click to stop rotating.

- To create new selection sets, hit your "spacebar" to clear the current selection set (while focus is in *Power Selector* dialog) and place a shape around the new set of text blocks.

✓ *Refer page2-28 for more information on the Power Selector tool.*

Individual Rotation

To perform individual rotations, rotate the text block around the point established by the Survey Crew, which is also the center/origin point of the cell it identifies.



Click the **Rotate** tool from the *Main* tool frame. In the *Tools Setting* dialog, click the down arrow to *Show Extended Information.* Place a checkmark in the *About Element Center* box of the dialog box. Click near the text block (the actual pivot is set to the text block's origin based on the tool setting). The text block will rotate dynamically as you move the mouse around *AccuDraw's* compass. Left click again to define the amount of rotation. Right Click to stop rotating the text block.

Step Twelve: Moving Text

After text is rotated, it may also require moving. Use common sense when moving items nearest the vertex that they describe so the plan "looks good". Use the *Move Element* tool to move single text blocks.

- Snapping to text (middle mouse) will show you what the text is describing. This works well in areas where text is on top of text making it difficult to distinguish. Identify what the text is describing and move it to a better location until all elements are clearly identified.

Step Thirteen: Add Note to Cleanlog.txt File!

Make a comment to the Cleanlog.txt to let people know that the wetlands have been cleaned up.

- Regional Office employees that copy the project locally should browse to the Y:drive PIN folder and make the edits to the network copy of the Cleanlog.txt so that other employees can check the status of the project. If you make the comments to your local Cleanlog.txt file, no one else can see this but you.

ADDITIONAL WETLANDS CLEANUP

Quick Punch List

- Copy wetlandsadd# file(s) from Survey/MSTA to Topo folder
- Cleanup Files
- Flatten Files
- Blend the two Files
- Merge file into wetlands.dgn
- Add note to Cleanlog.txt file

♫ This punch list is to give an overview of what is to be done with additional wetland files. If the wetlandsadds are needed prior to the cleanup, copy the files to the topo folder temporarily.

♫ Supply your wetlandsadd number where you see a "#" sign.

Step One: Copy Wetlandsadd#

Copy wetlandsadd#.dgn from the **Survey\Msta** folder into the **Topo** folder using Windows Explorer.

♫ Refer to page 3-52 to see how it was done in the Initial Wetlands Cleanup portion of this manual.

Step Two: Add Note to Cleanlog.txt File!

As a courtesy to others, always add a note to the **Cleanlog.txt** file located in the **Topo** directory as progress is made during the cleanup process. Here are a few examples of informative cleanup notes.

03/04/02 John Doe - Started **Wetlandsadd#.dgn** cleanup.

03/07/02 John Doe - Finished **Wetlandsadd#.dgn** cleanup.

03/07/02 John Doe - Started/Finished **Wetlandsadd#.dgn** cleanup.

♫ Regional Office employees that copy the project locally should browse to the Y:drive PIN folder and make the edits to the network copy of the Cleanlog.txt so that other employees can check the status of the project. If you make the comments to your local Cleanlog.txt file, no one else can see this but you.

Step Three: Open Wetlandsadd#

Click Bentley (MicroStation) icon and pick your *Project* from the pull down. Browse to the **Topo** folder. Select **Wetlandsadd#.dgn** and click OK.

♫ If the project pull down does not take you to your project, contact your CADD Support personnel.

Step Four: Attach Reference Files

Select **File>Reference(DOT)>Attach** from the Main Menu. Select the **Wetlands.dgn,** browsing to the **Topo** folder if necessary. Click OK. It is not necessary to enter a *Logical* name or description for any attachments to this file. Attach by *Coincident World* method. Select the **alignments.dgn,** browsing to the **Highway** or **Bridge\MSTA** folder if necessary. Click OK. Attach by *Coincident World* method.

Step Five: Refer to Step 6 through Step 13 in the "Initial Wetlands Cleanup" portion of this manual

Follow the same steps that were followed when doing an Initial wetlands cleanup.

MERGING NEW WETLANDS WITH OLD

Step One: Open Wetlands.dgn and Attach Wetlandsadd#.dgn

Open **wetlands.dgn** from the \topo folder. Select **File > Reference(DOT)>Attach**. Browse to the **Topo** folder if necessary and select **Wetlandsadd#.dgn.** It's not necessary to enter a *Logical* or *Description.* Attach by *Coincident World* method.

Step Two: Merging Wetlandsadd# Files

Once the Wetlands file has been edited to allow for incorporation of the new wetlands, open the **File>Reference(DOT)>Dialog.**

From the *Reference File* dialog, select the **Wetlandsadd#.dgn** file. Then select **Tools>Merge Into Master.** Following the prompts, click in your view window. This dialog will come up (Figure 3-46) warning you that you are about to merge the Reference file into your current file.

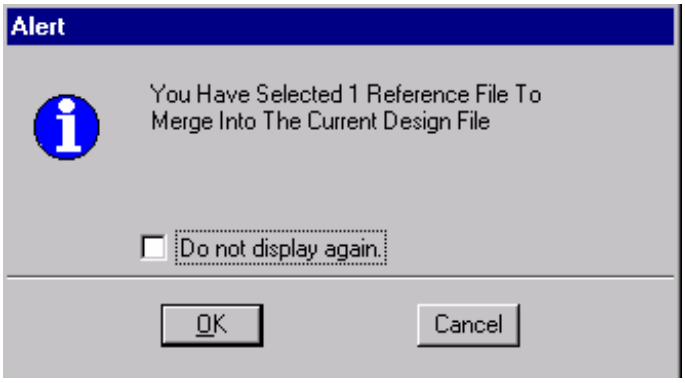


Figure 3-46: Merging Reference File Alert

If everything looks good, click OK to proceed.

Hit *Refresh.*

Step Three: Moving Wetlandsadd#

Using Windows Explorer, move the **Wetlandsadd#.dgn** file(s) you just edited and merged from the **Topo** folder to the **ADDSDONE** folder located in your project's **Topo** folder.

- If Wetlandsadd drawings still exist in the **Topo** folder, this should tell a user that the clean up and merging is not yet complete.

Step Four: Add Note to Cleanlog.txt File!

Follow steps previously outlined in this document. Add a note saying that the two files have been merged.

- Regional employees make changes to this file on the Y: drive.

Step Five: Copy Contents of Topo folder to Y:drive (Regional Employees)

If you are a Regional Employee or did the cleanup on your C: or D: drive, synchronize your files in the briefcase (if one was used) or copy the contents of the Topo folder on your hard drive to the Y: drive Topo folder of your PIN number. As in similar procedures outlined in this manual, use the **Edit>Copy** and the **Edit>Paste** commands in Windows Explorer.

Chapter 4 Plan Development

TITLE SHEET DEVELOPMENT

Quick Punch List

- Create a Title Sheet Using Make Sheetz
- Edit Headings Using Border Macro
- Create a Location Map
- Create a Layout Drawing (If Necessary)

CREATE A TITLE SHEET

Step One: Open MicroStation

To begin, double click on your **MicroStation** icon and select your project from the project pull down. Open any file.

Step Two: Create Title Sheet

Select **File>Make Sheetz** from the *Main Menu.*

Use a numbered prefix. The default is 001_ which makes this the first sheet in your final plan set.

- If for some reason you will need two title sheets for this project, add the suffix "1" to avoid having two files with the same root file name.

✓ *Refer to page 1-18 for help making sheets.*

Step Three: Editing Text Headings

Do not manually edit the text in your title sheet. Use **Workspace>Edit Project Data(PCF)** to change all of the variables in your drawing. Variables are any text in your drawing that has a "$" or "@" symbol in it. The text that remains can be edited by using the *Edit Text* tool or by selecting **Text>Edit Text** from the *Main Menu.*

✓ *To learn more about editing variables in your PCF file, refer to PCF Editing on page1-25.*

CREATING LOCATION MAPS

Step One: Open Location Map

From the *Main Menu*, select **File > Open Location Map**. Select the file called "Statemap-local.dgn". This should be pointing to your C: or D: drive if you have the Location Map files copied locally. You can open the files over the network, however they are large are will open very slowly. Contact CADD Support if you are pointing to the network for the Statemap#.dgn files.

Step Two: Locate the Project Area

Find the area of the state that your project is located. Once you have located this area, run the location map macro from your *Main Menu* by selecting **Macro > Location Map**.

Step Three: Place the Square

Once the macro has been activated a square boundary element will appear on your cursor. (If it doesn't, you may be zoomed in too close.) Place the square around the project area trying to encompass any text that you want to appear in your map.

- The size of the square can be modified to cover a larger area by adjusting the X, Y and scale (i.e. X=2, Y=2, Z=2 to double the area of the map) before placing it on the map. Contact CADD Support for assistance if necessary.

Step Four: Save the Locmap.dgn

A dialog will appear stating the directory path and a default file name of **Locmap.dgn.**

ⓘ ***If this is not the right directory, hit Cancel. You will need to start back at Step No. 1 of the "Create a Title Sheet", selecting the correct PIN from the "Project Pull-down" in the MicroStation Manager dialog.***

If all looks good, Hit **OK** to let the macro create the file. It will then open the file it just created.

Step Five: Copy Map to Clipboard

After the macro opens the file it just created, it will select all elements and copy them to the clipboard. It will show you the **Information** dialog (Figure 4-1).

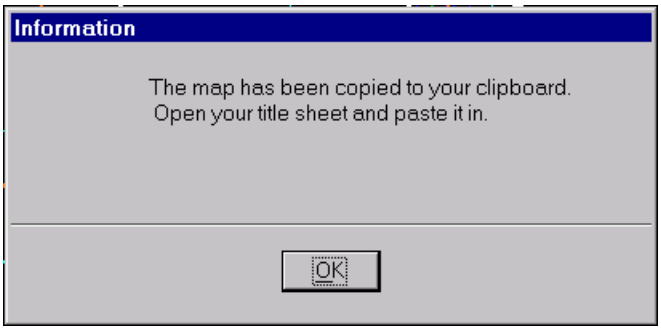


Figure 4-1: Map copied to clipboard

ⓘ ***This step doesn't always work. What the macro intends to automate is selecting all of the elements in the file, snapping (without accepting) to a corner of your box and activating the Edit>Copy command. Do this manually if the automation doesn't work.***

Step Six: Paste Map

Select **Edit>Paste** from the *Main Menu.*

Set the scale in the *Tool Settings* dialog. Here are some scales to use when pasting the location map into certain files:

1:1 border drawing, (i.e. 001_Title.dgn) set the scale to .00000789 for U. S. Customary projects (.00001 for metric projects).

1:250 border drawings, (i.e. 003_Plan1.dgn) set the scale to .0025. This is used for the Bridge Programs metric "Preliminary Plan" drawings.

1:300 (1" = 25') border drawings, (i.e. 003_Plan1.dgn) set the scale to .00234. This is used for the Bridge Programs U.S. Customary "Preliminary Plan" drawings.

Snap to the corner of the location map box on your title sheet. Left Click to accept.

Once you have pasted the map into the title sheet you can clean it up as necessary.

♫ If you adjusted the size of your map to cover a larger area (i.e. 2 times larger) enter one of the scales above depending on the application. Use *AccuDraw's* calculating ability to divide ("/") the X, Y and Z by 2 to get the map to fit the standard map border. Adjust the scale as necessary.

CREATING A LAYOUT (HIGHWAY PROJECTS WITH A SURVEY & DESIGN)

Introduction

Once the proposed design file (i.e. highway.dgn or bridge.dgn) has been created and flattened to zero, follow these steps to create a layout drawing to be placed on the title sheet.

Step One: Create a Layout Drawing

Open any drawing in your PIN directory if you're not already in one. From the *Main Menu*, select **File>Make Sheetz.** Create a drawing called **z_layout.dgn.**

✓ *Check page 1-18 for more about creating drawings using the Makesheetz macro.*

Step Two: Place a North Arrow

Do a *Fit View*. The default *View* orientation should be *Top* which means North is up. Using the **Plan Sheet Settings Manager**, select **Symbols & Linestyles > North Arrow True.** In the *Tool Settings* dialog, enter 90 degrees in the *Active Angle* field, click on the padlock to lock the X, Y, and Z fields. (Figure 4-2)

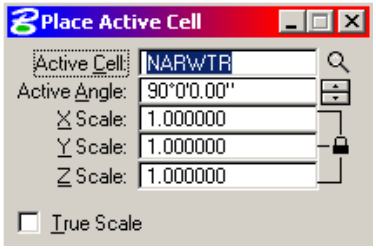


Figure 4-2: Adjust Active Angle, Padlock locked

Type **300** (250 metric) in the *X* field, followed by a (**Shift+8**), then, enter the total number of clip boundaries on the main line for your project (your referenced hdplan.dgn boundaries) in the layout drawing. This will size the cell appropriately for the title sheet. (Figure 4-3)

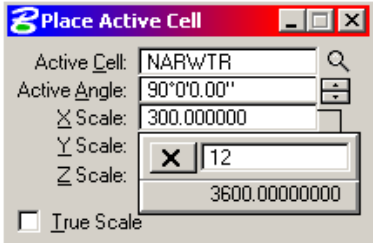


Figure 4-3: Using AccuDraw's Calculator

Set the cell down close to the boundaries in your layout drawing, with a *Datapoint.*

Step Three: Rotate Your View

Rotate your view using the **3 points** method until the graphics in your view are aligned the way you want to see them on your title sheet.

- To make clip boundary horizontal: snap and accept to the lower left and lower right corners of your boundary. These two points define the X-axis. Snap and accept to the upper left corner of the boundary to provide the final point (positive Y direction according to your first point).

Step Four: Create a Saved View

Using the **Plan sheet Settings Manager**, select **Create Plan Sheets > Create Saved View**. Now define the rectangle for your saved view. Be sure to encompass all clip boundaries and your north arrow. Read the dialog and follow the prompts.

A dialog will appear asking for a name of your saved view. Name it "**layout."** A description is not necessary.

Leave the *Add Shape* box **unchecked.**

Click **Make. (**Figure 4-4**)**

Figure 4-4: Saved View Dialog Settings

Step Five: Reference the view into the Title Sheet

Open the **title sheet** (i.e.001_title.dgn).

Go to **File > Reference (Dot)>Attach.**

Select **z_layout** and hit **OK**.

In the *Attach Reference Settings* dialog, select the named view called "**layout".**

Determine how many *clip boundaries* (plan sheets) on the main line for your project (your referenced hdplan.dgn boundaries) in the layout drawing. Multiply this number by the scale in which the sheets were cut (i.e. **300** (250 metric)). Enter this number in the right most field of the scale (Master:Ref) portion of this dialog to scale your layout file appropriately. (i.e. 12 sheets x 300 = 3600) See Figure 4-5.

- If after attaching you decide that you want to the area is too large to fit on the title sheet, you can adjust the attachment with a series of commands or simply detach and reattach adding a one to your number of sheets. (i.e. 1 + 12 sheets (13) x 300 = 3900)

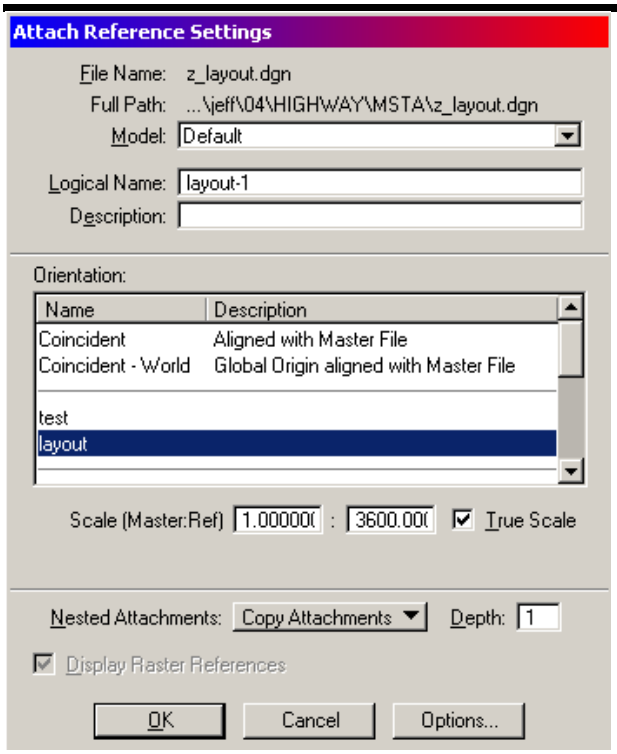


Figure 4-5: Sample Setting for Attaching Layout

Set the *Nested Attachments*: to **Copy Attachments** with a *Depth* set to "1". This will attach the layout drawing and everything it has attached with it.

✓ *Check page 2-71 for an explanation of Reference Nesting.*

Click OK and you should see a rectangle on your cursor. Left click to place it down on the title sheet. You can move it if necessary in the next step.

Fit View.

- If you aren't seeing the same thing you saw in your *layout.dgn*, place a fence around the border and select **File>Reference (DOT)>Clip>Boundary>All.** Set the *Method* to **Fence,** place a *check* in the *Use References Dialog List* and click in the view window (Figure 4-6).

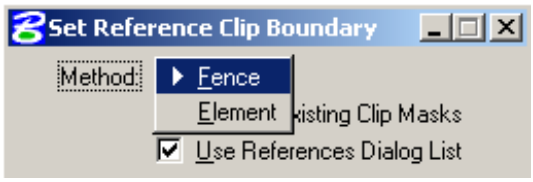


Figure 4-6: Set the Clip Boundary Tool Settings dialog

Step Six: Tweaking the Layout Placement

Once the layout is placed, you can still manipulate the reference files.

Go to **File > Reference (Dot) > Dialog**. Select all reference files in the dialog.

In the **Reference Dialog**, choose **Tools > Move** or **Tools > Scale** or **Tools > Rotate** if things need to be moved, rotated or scaled again. You can repeat this function as many

times as you want, being sure that all reference files are selected before manipulating. You may need to move other things around in your Title sheet to make room for it (i.e. scales, location map box, etc).

ⓘ ***When rotating the referenced saved view, rotate it in the "Z" value only.***

Step Seven: Stationing the Layout

Introduction

The alignment drawing that is attached is most likely too small to read on your Title sheet. It is also centered in your roadway which is going to be filled in, identifying the new pavement area. The alignment is a temporary attachment to be used as a guide for the next step and can be shut off eventually.

Part One: Open z_layout.dgn

Open your **z_layout** drawing and turn off your graphic group lock (**Settings>Locks>Graphic Groups)**.

✓ *Refer to page 2-41 for a description of working with graphic groups.*

Part Two: Copy Alignment String

Copy your alignment element into the **z_layout** file using the copy tool. It isn't necessary to copy in the station or tick marks.

Part Three: Graduate – Create New Tick Marks

Measure a rough distance from the centerline to a point just outside of the proposed pavement area to determine how long the tick mark will have to be to still be visible once the pavement is filled in.

Use the *Plan Sheet Settings Manager* to place station lines by selecting **Graduate** from the left side, and depending on the proposed pavement widths, select a tick mark that will be long enough to be visible outside of the shaded pavement area. Current options are 20', 25', 40' 50' and 60' for US Customary projects (5 m, 10 m and 15 m for metric projects).

A new toolbox should be on your screen. (Figure 4-7) Click on the **Place cell along** tool.

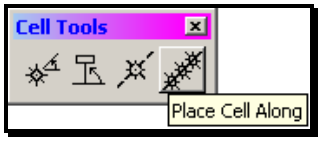


Figure 4-7: Pace Cell Along Tool

When the dialog opens, enter the desired spacing for the tick marks. Defaults are 100' or (10 meters). (Figure 4-8)

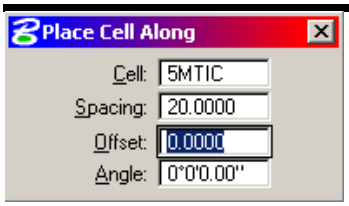


Figure 4-8: Place Cell Along Dialog

Snap to the beginning of your centerline to see how your ticks are going to be placed. Click to accept or reject the placement. If your alignment does not start at an even station, delete a portion of the "copied" center line to force it to start at an even station.

- The normal text for stationing is 100 feet (20 meters), but if you have a really long job, maybe you might want to space them at 1000 feet (100 meters) or another even increment. Be sure that the *Offset* and *Angle* are both set to "0". (Figure 4-8)

Part Four: Adding Text for Stations

Open your **001_title.dgn.** It's best to station the alignment in the Title Sheet to produce standard size text.

Right Click on the *Settings Manager.* Set the *Category Scale* to 12" = 1 ft. (1:1 metric) (Figure 4-9).

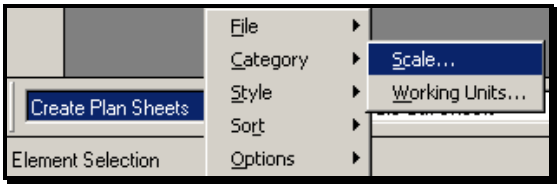


Figure 4-9: Right Click, Category Scale

Using your *Plan Sheet Settings Manager*, select **Proposed Text and Dims>Standard Text (Normal).** Start placing your station text. For long jobs, it may make sense to place your stations every 1000 feet (100 meters).

- Use AccuDraw's functionality of "o" (origin) and "rq" (rotate quick) to place the text at different angles along your project's centerline.

Step Eight: Shading the Layout Drawing

Introduction

This step will shade all proposed pavement areas. Due to certain limitations, you will have to do this in sections as opposed to one large filled shape. Shading should be done in the **z_layout** drawing. It is important that your proposed design **(Highway.dgn)** has been flattened to "0" along with the **z_layout** drawing.

- On large projects, shading may not be necessary because the layout is scaled down so small that when printed, the proposed pavement lines themselves are so close together that they appear to be one solid line. Print out a test plot of the Title Sheet to determine if shading is necessary.

Part One: Open z_layout

Part Two: Create Temporary Lines

Use the *Smartline* tool to create lines across (perpendicular) the roadway every 1000 to 2000 feet (100 to 200 meters) or so to break the shading into manageable areas. Straight portions of the alignment may allow you to shade larger sections at a time.

- The highway.dgn typically needs to have lines draw on it to signify the match points on the beginning and ending of the main line and the limit of work on the side roads. Do this work in the highway.dgn by *Smart Matching* the shoulder or travelway line then drawing a line connecting the opposite shoulders at the beginning and ending of the project.

Part Three: Flatten

Flatten the drawing by selecting **Macros>Flatten** from the *Main Menu.*

Part Four: Select Boundary Lines of Area to be Shaded

Using your *Power Selector* or similar means, select the lines that define the boundaries of area to be shaded (i.e. edge of pavements, and 2 junk lines you created earlier).

Part Five: Create Regions

Select **Group>Groupings>Create Regions** from the *Main Menu* or pick the **Create Regions** tool from the *Groups* tool box. Set the dialog to look like Figure 4-10.

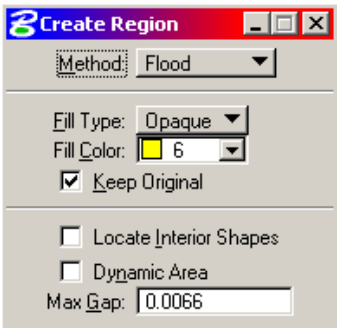


Figure 4-10: Create Region Settings

The color you select is optional. All colors, with the exceptions of 10-16, will print black. Colors 10-16 will print a shade of gray.

The *Level* that you place the shading is optional. It is a good idea to select a *Level* that is not being used.

Part Six: Flood Area

Click anywhere inside of the area you *Power Selected.* Click again to *Accept.* This should fill the area.

- If you get a warning that says “No Enclosing Region Found”, you can adjust the *Max Gap* to a larger number so the tool will jump gaps in the lines.

- If you get a warning that says “Shapes are not coplanar”, it could mean that the Highway.dgn or possibly the z_layout.dgn isn’t flattened. Re-flatten both drawings and try again.

If all else fails, change your *Method* to *Points* and use data points to create the filled shape, however, this doesn’t work so well around curves.

Contact your CADD Support for assistance.

Step Nine: Adjusting the Layout Scale

U.S. Customary Projects

To adjust the scale, you will need to take in account what scale you placed the Layout into your title sheet. In Step 5, we counted the number of clip boundaries (12) and multiplied that by 300 to get 3600. Divide this number by 12 to get the scale per inch of your Layout drawing. In this example your scale per inch would be 300.

You can also find out what scale factor you used by opening the **File>Reference** dialog and double clicking on one of the attachments and looking to the Scale (*Master:**Ref**)* portion of the dialog. Divide the reference scale by 12.

Use **Text>Edit Text** from the *Main Menu* to edit the text in the bar scale Figure 4-11.

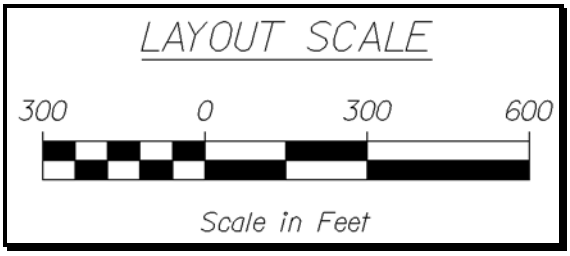


Figure 4-11: U.S. Customary Layout Scale Example

Metric Projects

To adjust the scale, you will need to take in account what scale you placed the Layout into your Title Sheet. In Step 5, we counted the number of clip boundaries (12) and multiplied that by 250 to get 3000. Multiply this number by .02 and the result is the scale used in the Layout bar scale (i.e.3000 X .02(constant) = 60 meters).

You can also find out what scale factor you used by opening the **File>Reference** dialog and double clicking on one of the attachments and looking to the Scale (*Master:**Ref**)* portion of the dialog. Multiply the reference scale by .02.

Use **Text>Edit Text** from the *Main Menu* to edit the text in the bar scale Figure 4-12.

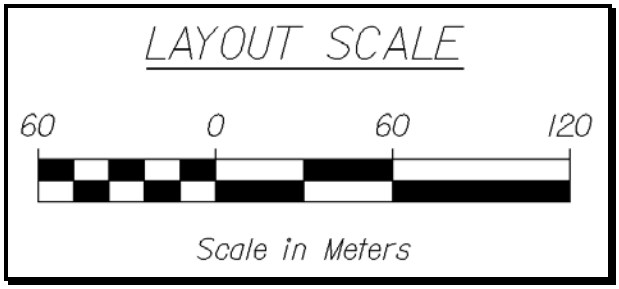


Figure 4-12: Metric Layout Scale Example

Step Ten: Place Text on the Title Sheet

Use the *Settings Manager* (**Prop. Text and Dims>Standard Text (Normal)** to enter text labels for Side Roads, Town Lines, Sheet Numbers, etc.

CREATING A LAYOUT (NO SURVEY)

Introduction

This section is intended for projects with no survey. We will use a portion of the Location Map to create a rough drawing as your layout.

Step One: Place Temporary North Arrow

Before you clip out an area from the Location Map for your layout, place a small vertical line near the project area. This will represent north. North is up in the map.

Step Two: Place a Fence

Use the *Place Fence* command and set the *Fence Type* to ***Shape*** and the *Fence Mode* to ***Clip***(Figure 4-13) **(Group>Fence>Shape).**

Figure 4-13: Place Fence – Clip Mode

Place your fence around the project area, as close to your project as possible, encompassing only the beginning of side roads and your temporary north arrow Figure 4-14.

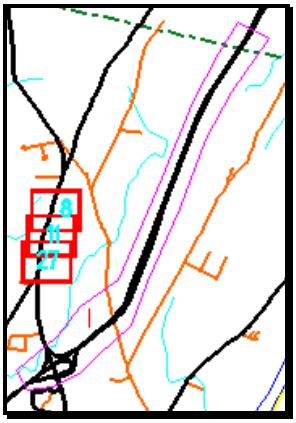


Figure 4-14: Fence Encompassing Project Area with Temporary North Arrow

Step Three: Copy Fence

From the *Main Menu*, select **Group>Copy Fence** or use the *Manipulate Fence Contents* tool**.** Verify that the *Fence Mode* is set to **Clip** (Figure 4-15)**.**

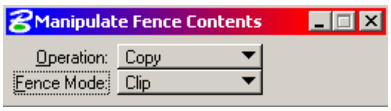


Figure 4-15: Manipulate Fence Contents Settings

Place a *datapoint* to define where you want to copy from and click another *datapoint* in the middle of your title sheet to place the contents of the fence.

Step Four: Scale and Rotate

Use *Power Selector* and select your new layout elements. Use a combination of *Scale Element* **(Zip>Scale)** and *Rotate Element* **(Zip>Rotate>Rotate By 3 Points)** to adjust the layout to fit within your Title Sheet.

Step Five: Adjust Scale

The scale of the layout drawing pulled from the location map will be somewhat rough. It may be a good idea to simply remove the scale for the layout and add a note stating it is "Not to Scale".

Step Six: Place North Arrow

Using the **Plan Sheet Settings Manager**, select **Symbols & Linestyles > North Arrow True.** In the *Tool Settings* dialog, set the active angle to "0" and set the X, Y, Z scales to 1. Snap to the middle of the line you placed in the location map to represent the temporary north arrow. Before *Accepting,* type "O" for origin, then follow it by "RQ" on your keyboard. Snap to the end of the line that should point to north, Accept the *AccuDraw* rotation. Now move the arrow to wherever it fits well on your title sheet. Use a *datapoint* to place the arrow. Delete the "temporary line representing your North Arrow.

Step Seven: Place Text on the Title Sheet

Use the *Settings Manager* (**Prop. Text and Dims>Standard Text (Normal)** to enter text labels for Side Roads, Town Lines, Sheet Numbers, etc.

TYPICAL SECTION SHEET DEVELOPMENT

Quick Punch List

- Create a Typical Sheet Using Make Sheetz
- Run "Template" Macro
- Edit and add cells
- Add Dimensions and text
- Edit Border Using Border Macro

Things to Remember

Whether you use the typical section program to draw your lines or not, there is a certain strategy to keep in mind when you are drawing such things.

First of all, you should draw all your lines first, as the program would have you do.

Then you should trim up all the lines, adding cells if necessary.

Then you should add the dimension, text and notes.

ⓘ ***Use the Cross-Sections* Setting Manager *to draw new lines.***

♫ Draw the typical completely before you move on to labeling and dimensions. This will help you keep the elements in the right levels without needing to *Match Element Attributes* all the time.

Freehand Template Techniques

✓ *Refer to page 2-51 for an example of using AccuDraw to draw roadway sections.*

CREATING A TYPICAL SECTION DRAWING FILE

Step One: Open MicroStation

Open MicroStation and use the project pull-down list to move to your project directory. Open any drawing file in your PIN directory.

Step Two: Create a New Drawing(s)

Select **File > Make Sheetz** to create a new file for every typical sheet you will need. If there will be more than one, be sure to add a suffix in the make sheets dialog (Figure 4-16).

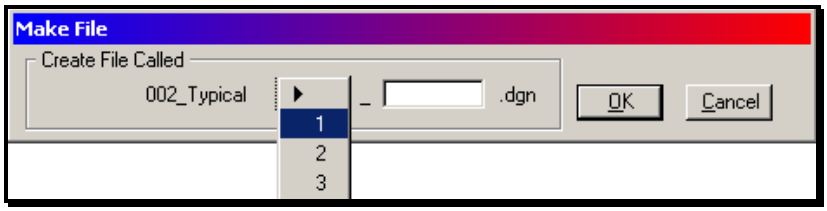


Figure 4-16: Selecting a Suffix for Multiple Drawings of the Same Type

✓ *Refer to page 1-18 for help creating files.*

CREATING TYPICALS USING THE TEMPLATE MACRO

This macro was created for the Bridge Program to make drawing templates on Cross Sections easier. This can be used for Typical Sections as well. It allows you to place guardrail and curbing, and remembers your setting should you need to make more than one.

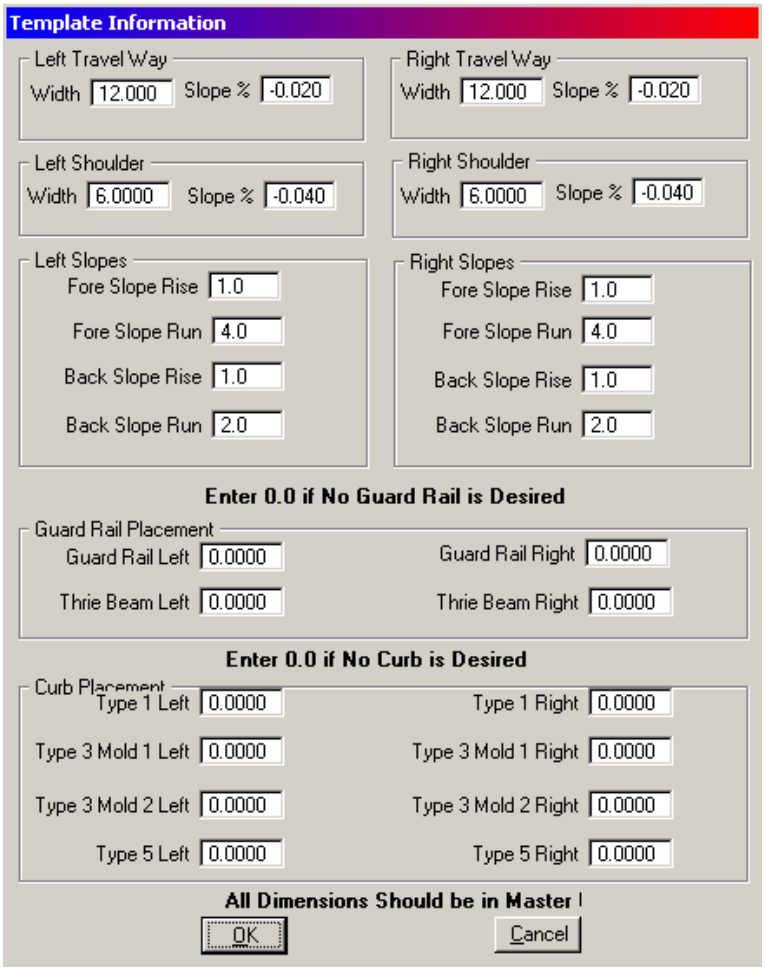


Figure 4-17: Typical U.S. Customary Template Information Dialog

The Guardrail and Curb placement requires that you give the offset from the centerline to the cell. Look to the Standard Details for the proper offsets or ask your designer.

DIMENSIONS, TEXT, AND NOTES

ⓘ ***Always use the Settings Manager when placing dimensions and text. This is especially helpful in keeping your elements on the correct levels.***

✓ *Check page 2-20 for a complete introduction to the Settings Manager.*

Why are levels so important? These files may need to be archived, translated to different CAD systems, or they may be used in the creation of As-Builts. If elements are on the right level, these processes will be much easier.

ESTIMATE SHEET DEVELOPMENT

Quick Punch List

- Add Items To Estimator (If Necessary)
- Export Items from “Estimator”
- Make Estimate Sheet Using Make Sheetz
- Import Items from CSV file
- Adjust Lump Sum Items (If Necessary)

EXPORTING QUANTITY ITEMS FROM THE ESTIMATOR

Introduction

This is a description of how to export a list of Quantities for the purpose of filling out the Estimated Quantities sheet. This assumes that all or most of the items have been previously entered into the Estimator program.

✓ *For information on using the Estimator program, refer to page15-2.*

Step One: Getting into Estimator

First you will need to double click on the icon on your desktop.

ⓘ ***Contact CADD Support if you do not have an icon. Experienced users: Map any drive letter to \\dot0dta1fsaug01\$Com-ProgMan\Highest\ folder. Right click the Highest.exe and select Send To>Desktop (create shortcut).***

Now log in (Figure 4-18)

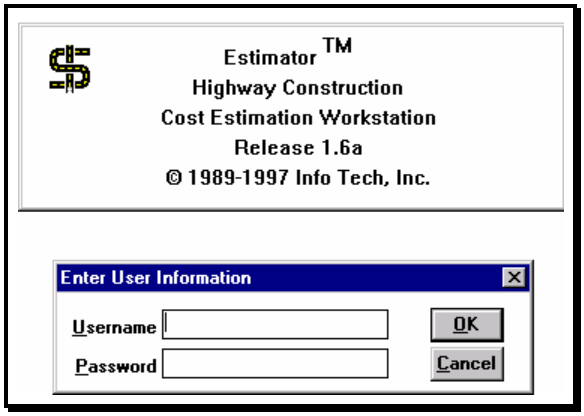


Figure 4-18: Log In to Estimator

"Beta" is the user name and "User" is the password.

♫ Usernames and passwords are case-sensitive: you must capitalize the first letter of each word.

Step Two: Exporting (*.he) File

Once you are in the Estimator program you must select the appropriate file that was created by either you or the Designer and open that file.

Now that you have selected the file, go to **File > Export.**

Here is the important part, you must select the **Export File Format:** and change this to**: Lotus (Category Items)** even though we do not use Lotus products (Figure 4-19).

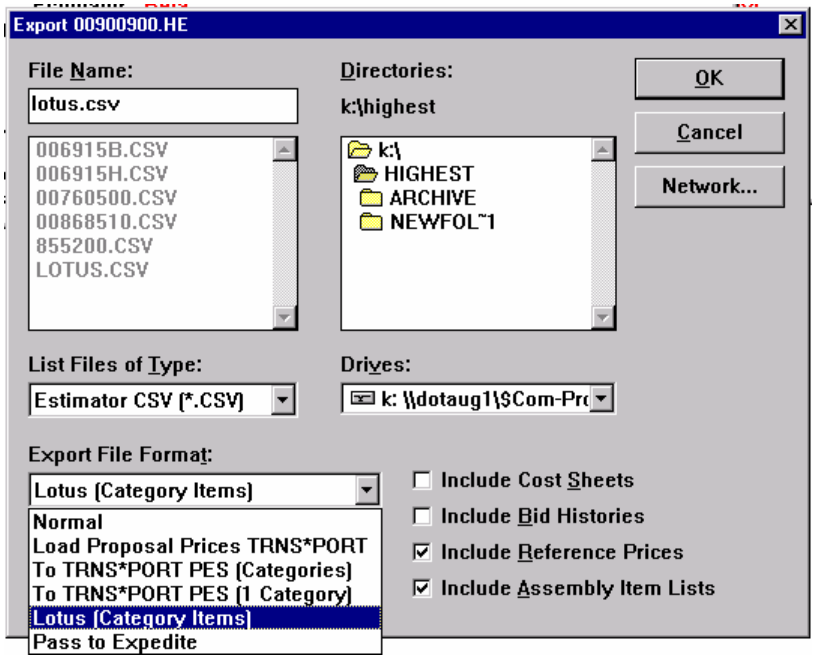


Figure 4-19: Export Dialog

Next you will need to change the directory to the appropriate PIN directory that you are working in. To do this you need to select the drive letter that the PIN is sitting in. In this case MDOT standards is the **Y** drive**.**

Once there, double click on the Pin folder, your PIN number and to your workgroups \MSTA folder. This is where the macro looks for this file (i.e. **y:\pin\9009\00\highway\msta\).**

Now that everything is set, hit the **O.K.** button and the **Estimator** will go through its process of exporting the document into the **MSTA** folder in your pin directory.

IMPORTING LOTUS.CSV FILE INTO ESTIMATED QUANTITIES SHEET

Step One: Open MicroStation

To begin, double click on your **MicroStation** icon and select your project from the project pull down. Open your ###_Estimate.dgn if it exists, otherwise, open any file.

- Some older projects have an estimate.dgn in the MSTA directory. This file doesn't have any grid lines in it and should be deleted. Make a new sheet.

Step Two: Make an Estimate Sheet

If you don't have an estimate sheet (i.e. ###_Estimate.dgn), go to **File > Make Sheetz** and create one.

✓ *Check out page 1-18 for more information about making sheets.*

Step Three: Run Estimate Macro

Once you are in the drawing, you need to activate the macro to begin importing your estimate items. To do this, go to **Macros > Estimate**. You will be prompted to "*snap* to the upper left corner of first table" (Figure 4-20). *Accept* with a left click.

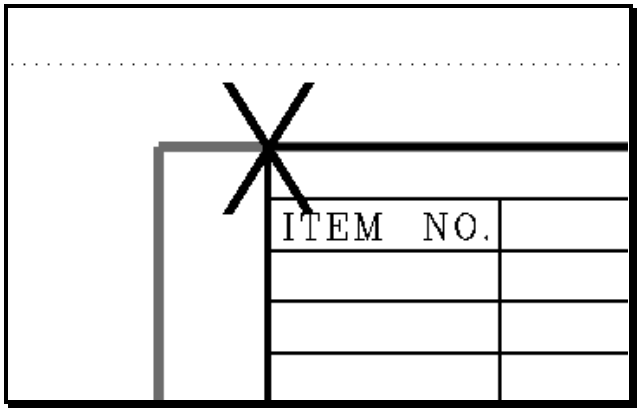


Figure 4-20: Example of Snap Point "Upper Left Corner of First Table"

Step Four: Adjust Quantities

This should have filled out your Estimated Quantity sheet. It will be necessary to edit text on a couple of the items that are supposed to be **L.S.**, but because the Estimator requires actual quantities for the item, it will require that you change the value to "1". Use the *Edit Text* tool.

The Contract Section would rather not see decimals in the quantities. Edit the text and round all decimal number up to the nearest whole number.

ⓘ ***If you would rather use a different justification on certain text, use Text>Rejustify (Macro) and select the text you want to change. When the dialog comes up, pick the new justification.***

- If there are changes to the Estimator (*.he) file, you will need to export another Lotus.csv file and overwrite the existing one. Then go into the file, delete the existing list, and re-run the macro.

Additional Sheet Needed?

Occasionally you may have more items than one Estimate Sheet will hold. In this case, the macro writes the additional information off to the right of the border. If your original border hasn't been dropped, copy it and place it with the additional items. (If it has been dropped, get a copy from the USBorder/Border cell library.)

Place a fence around the new border and select **Utilities>Development Tools>Fence File** from the *Main Menu.* When the new dialog appears, supply the name of an additional Estimate Sheet (i.e. 004_Estimate2.dgn) being sure to increment the prefix and suffix. Click OK. Click on the screen to *Accept* the command. Open the new sheet. If all looks good, delete the extra border and contents from the original file. Contact CADD Support for assistance.

DRAINAGE SHEET DEVELOPMENT

Quick Punch List

- Copy Drainage Spreadsheet into PIN directory
- Enter drainage data into **drainage.xls**.
- Save **drainage.xls** as a *tab-delimited text file*.
- Create a Drainage Sheet using Make Sheetz
- Run the Drainage Macro

USING THE DRAINAGE SPREADSHEET

Introduction

This macro merges data from an excel spreadsheet into MicroStation. There are a couple of steps involved. Follow them exactly.

ⓘ ***Do not attempt to be creative in the naming of your file or create multiple files to somehow trick the program. It won't work.***

Step One: Copy the Spreadsheet

The **drainage.xls** spreadsheet is a standard form. The **drainage.xls** template is located in the **Y:\msworksp\MDOT MicroStation Utilities\Spreadsheets & Notes** folder. Make a copy of this file and place it in your workgroup's **MSTA** folder before entering your project data.

ⓘ ***Do not edit the spreadsheet on the Y: drive!***

Step Two: Enter Drainage Data

Enter your drainage data into the spreadsheet. Do not attempt to reformat the spreadsheet in any way. Add all the information to this one spreadsheet even if there isn't any grid lines present in the rows or columns. Save your file.

♫ Make sure you save your changes by choosing **File > Save**.

Step Three: Save as TXT file

Our macro cannot access excel data when it is saved in workbook (xls) format. From **Excel**, choose **File > Save As…** This will open the **Save As** dialog (Figure 4-21).

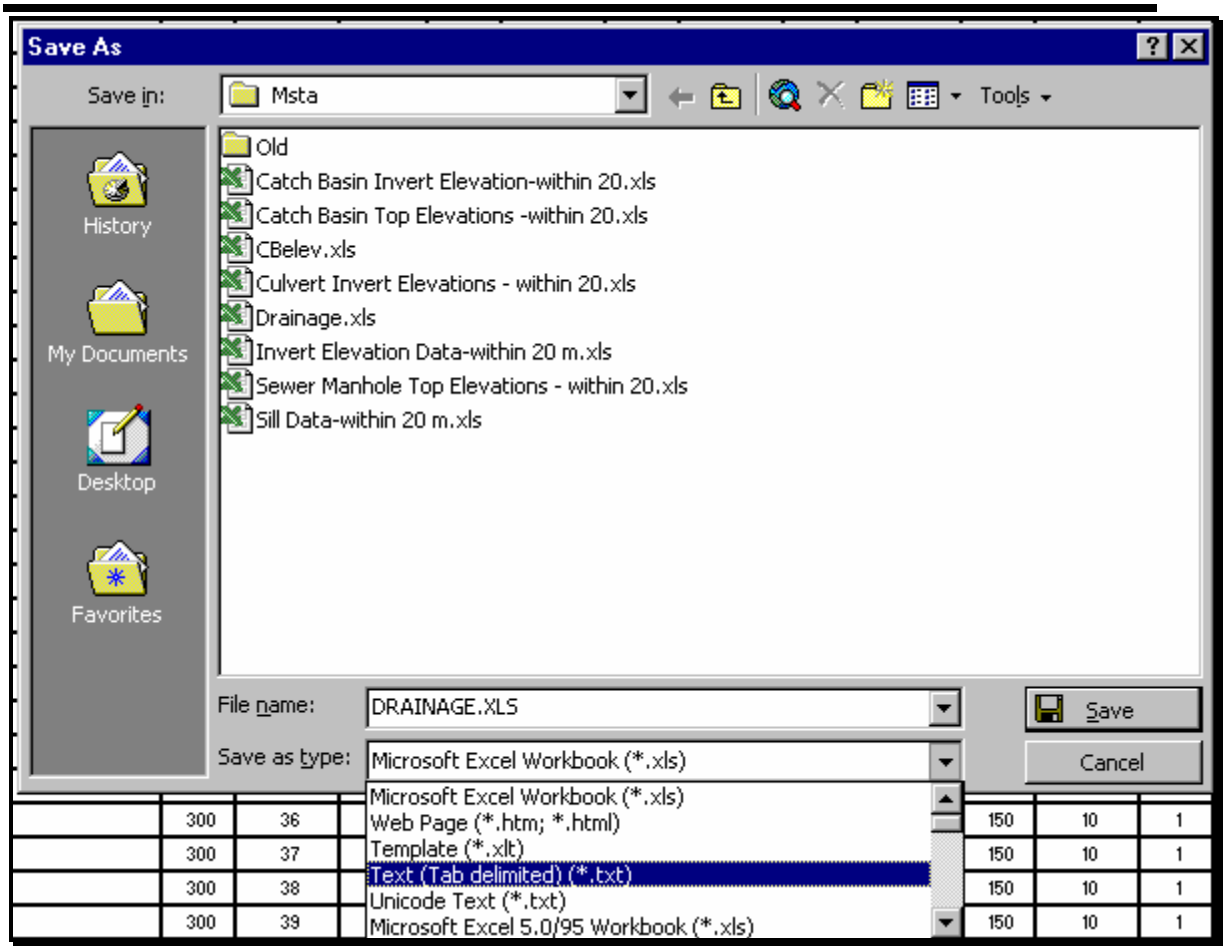


Figure 4-21: Save As Txt

From the bottom of this dialog, choose **Text (Tab delimited) (*.txt)** in the **Save as type** field.

Check that the file name is **DRAINAGE.TXT** and push the **Save** button. This will bring up a **Microsoft Excel** dialog warning you about the limitations of tab delimited text (Figure 4-22).

Figure 4-22: Save As Warning

Tab delimited text files aren't capable of handling all the formatting options of Microsoft Excel. This is not going to be a problem for us.

Dismiss this dialog by pushing the **Yes** button.

- Notice that you are now editing a file called “Drainage.txt”. This filename is a must for the macro to work Figure 4-23).

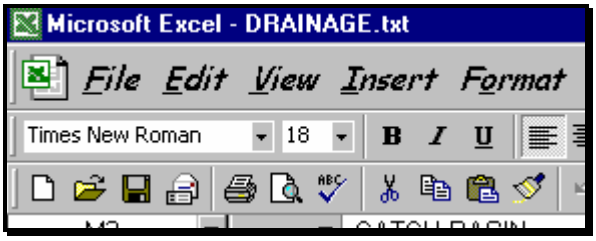


Figure 4-23: New File Name

You are now finished with **Excel**. Choose **File > Exit**. You will get a warning dialog like Figure 4-24.

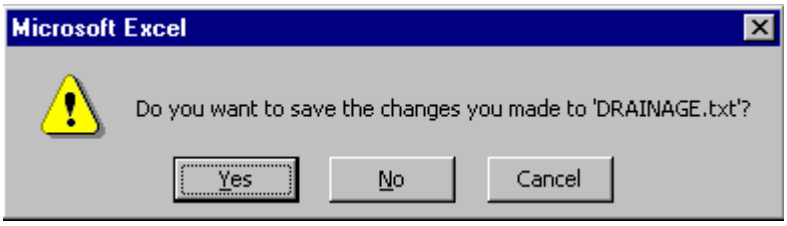


Figure 4-24:Save Changes?

You do **not** need to save this file again. Dismiss this dialog by pressing the **No** button.

IMPORTING DRAINAGE INFORMATION

Step One: Open MicroStation

To begin, double click on your **MicroStation** icon and select your project from the project pull down. Open your ###_Drainage.dgn if it exists, otherwise, open any file.

♫ Some older projects have a drainage.dgn in the MSTA directory. This file doesn't have any grid lines in it and should be deleted. Make a new sheet.

Step Two: Make an Drainage Sheet

If you don't have a drainage sheet (i.e. ###_Drainage.dgn), go to **File > Make Sheetz** and create a *numbered* sheet, with *Highway* workgroup. Choose *Drainage* as the file type.

✓ *Check out page 1-18 for more information about making sheets.*

Step Three: Run the Macro

From the *Main Menu* select **Macros>Drainage**.

MicroStation will prompt you "Drainage > Snap to upper left corner of first table" *Snap* to the point marked with an "X" in Figure 4-25, and *Accept*.

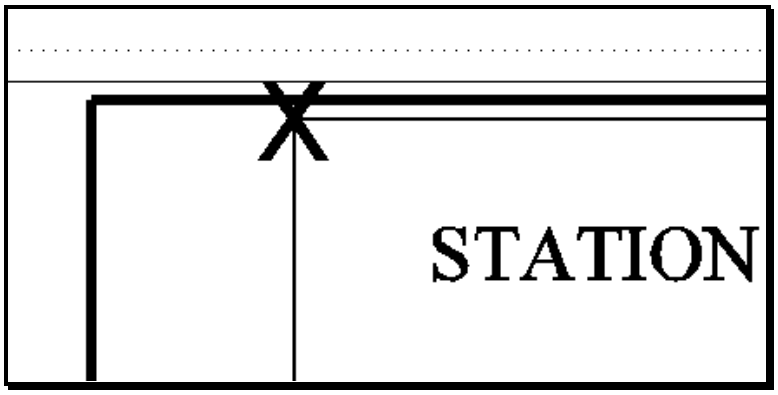


Figure 4-25: Upper Left Corner

MicroStation will place a column of text in every column of the table has information.

ⓘ ***If you would rather used a different justification on certain text, use Text>Rejustify (Macro) and select the text you want to change. When the dialog comes up, pick the new justification.***

Multiple Drainage Sheets

If you have more than 78 lines of drainage information, the macro will start placing another column of text to the right of the first table and place an additional border.

Place a fence around the new border and select **Utilities>Development Tools>Fence File** from the *Main Menu.* When the new dialog appears, supply the name of an additional Drainage Sheet (i.e. 004_Drainage2.dgn) being sure to increment the prefix and suffix. Click OK. Click on the screen to *Accept* the command. Open the new sheet. If all

looks good, delete the extra border and contents from the original file. Contact CADD Support for assistance.

NOTES SHEET DEVELOPMENT

Quick Punch List

- Copy Template from Y: drive to your PIN on the Y: drive
- Open and Edit the Template in Microsoft Office (i.e. Word or Excel)
- Save as new Format (according to specific instructions)
- Open new file, select range of text and Copy to Clipboard
- Open MicroStation, Make Sheetz and set text Style
- Paste (according to specific instructions)
- Edit Sheet Type in title box
- Run **Macros>Border Information**

LOCATION AND EXPLANATION OF TEMPLATE FILES

Introduction

We are using Microsoft Word for all text arranged in paragraph form, to be pasted into MicroStation. Text that is intended to be in columns should be produced in Microsoft Excel. We have placed template files in the following directory - **Y:\msworksp\MDOT MicroStation Utilities\Spreadsheets & Notes**. Please copy files from this location into your projects PIN directory under your workgroups MSTA folder. Do not edit the files in their original location.

General Notes

There are a few template files available to be used for generating your General Construction Notes. They require editing for every project and should be checked for accuracy.

Imperial General Notes.doc - This file has a listing of the most common General Notes used on U.S. Customary projects.

Metric General Notes.doc - This file has a listing of the most common General Notes used on metric projects.

Metric Expanded General Notes.doc - This file includes all of the General Notes in the *Metric General Notes.doc* file, plus, an additional 50+ notes that may pertain to more complex projects. Check both of these files and decide which one suits your projects needs.

Summary of Excavation and Borrow

The Summary of Excavation and Borrow is an Excel spreadsheet. It can be easily pasted into a MicroStation drawing for your final plans. The file is called **Summary-Excavation-Borrow.xls.** This form is sometimes confusing to do by hand on complicated projects. Just enter the figures and the formulas will take it from there. It also allows you to delete the lines (rows) that aren't needed. When doing this, the user must also delete out any lines with an **"ERR"** in them, starting from top of the sheet to the bottom.

Use the same instructions used when pasting Construction Notes into MicroStation.

Estimating US Customary Projects

We have a spreadsheet to help do one of the most tedious tasks of Estimating which is calculating your **Cuts** and **Fills**. Once you supply the stations, without the (+) symbol, the sheet will automatically fill in the distances between stations. (Do not enter numbers in the shaded cells) After you enter areas or lengths, it will automatically average them and give you totals. Each sheet will give you totals that are summarized on the **Index** of the spreadsheet. Right now there are only five pages for the calculations and an index. If more pages are needed, ask your support staff to create them and revise the master. Here is a listing of files available for English projects.

ENGLISH-ESTIMATE-CUYDS.xls - This is for estimating items requiring a cubic yard

measurement (i.e. Common Excavation, Gravel, etc.).

ENGLISH-ESTIMATE-SQYDS.xls - This is for estimating items requiring a square yard measurement (i.e. Loam, Sod, etc.).

ENGLISH-INDEX.xls - This is for indexing your estimate book that you turn in with your project. Many people are not including this with their comps, but if you are, this will make it easier. Also you can experiment with exporting a text file from Highest (Estimator) with out the prices.

Estimating Metric Projects

We have a spreadsheet to help do one of the most tedious tasks of Estimating which is calculating your **Cuts** and **Fills**. Once you supply the stations, without the (+) symbol, the sheet will automatically fill in the distances between stations. (Do not enter numbers in the shaded cells) After you enter areas or lengths, it will automatically average them and give you totals. Each sheet will give you totals that are summarized on the **Index** of the spreadsheet. Right now there are only five pages for the calculations and an index. If more pages are needed, ask your support staff to create them and revise the master. Here is a listing of files available for Metric projects.

METRIC-ESTIMATE-CUMETERS.xls - This is for estimating items requiring a cubic meter measurement (Common Excavation, Gravel, etc.).

METRIC-ESTIMATE-SQMETERS.xls - This is for estimating items requiring a square meter measurement (Loam, Sod, etc.).

METRIC-INDEX.xls - This is for indexing your estimate book that you turn in with your project. Many people are not including this with their comps, but if you are, this will make it easier. Also you can experiment with exporting a text file from Highest (Estimator) with out the prices.

GENERAL NOTES SHEETS

Step One: Copy the Template File

Using Windows Explorer, browse to the Y:\msworksp\MDOT MicroStation Utilities\Spreadsheets & Notes folder. Select the General Notes file that best pertains to your project. Copy the file from this location into your projects PIN directory, under your workgroups MSTA folder.

Step Two: Open and Edit Using WORD

Open and edit the Microsoft Word file, supplying your project specific information. Save the file in its native format (.doc).

Step Three: Save As .txt File

From the Main Menu, go to **File > Save As**., Select "**Plain Text (*.txt)**" in the *Save as Type* pull down (Figure 4-26). Verify that the path of the new file name is pointing to your PIN directory.

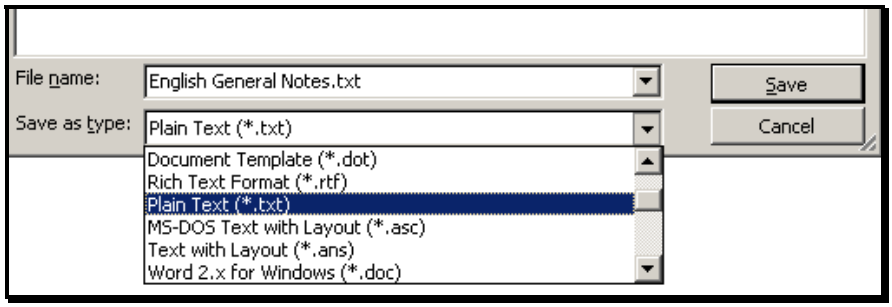


Figure 4-26: Save as type- Plain Text (.txt)*

A new dialog will open. Place a check mark in the "Insert Line Breaks" box (Figure 4-27) and leave the other defaults as is. Click OK.

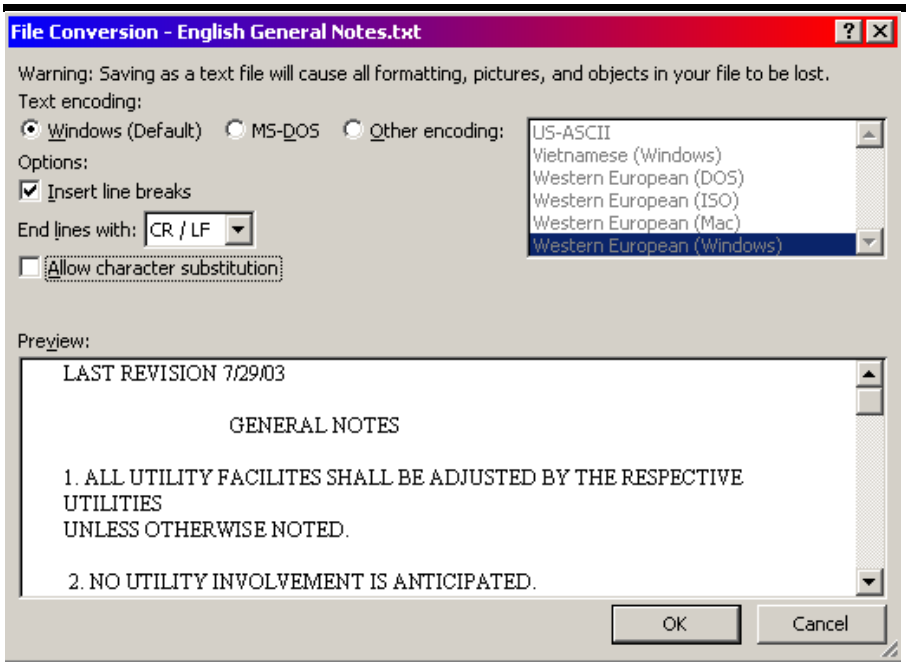


Figure 4-27: Select Insert Line Breaks

Close the Word document.

Step Four: Open and Copy the Text from the New File

Using Windows Explorer, browse to your projects PIN directory and open the file that you just saved with the **.txt** extension. Select the range of text you wish to paste into MicroStation. From the Main Menu, select **Edit>Copy.**

- You can select all of your text and manipulate it prior to placing it in the MicroStation *Text Editor* dialog. The *Text Editor* has the same capabilities as the Notepad text editor. You can Copy, Paste and Cut by either Right clicking in the dialog or using shortcut keys **Ctrl+C (Copy), Ctrl+V (Paste) or Ctrl+X (Cut).**
- If you are familiar with PFE Editor, Right Click the file and select "Open With…" then select "Choose Program" and select PFE Editor. You can select up to 100 lines of text and still fit it within your border. Notepad doesn't give you this information.

Step Five: Open MicroStation

Open MicroStation by double clicking the MicroStation icon on your Desktop and pick your PIN number from the project pull down. Open the MicroStation file that you wish to place the General Notes in. If necessary, create a new file from the Main Menu using **File > Makesheetz.** Use a numbered drawing, selecting **Notes** from the drawing type dialog. Consider adding "General" in the suffix to better specify the sheet type.

✓ *See the Make Sheetz documentation on page 1-18.*

Step Six: Set Your Text Size and Font

Right click on the Settings Manager and select **Category > Scale.** Normally, General Notes are placed on a border that hasn't been scaled. Select 12in. = 1 ft. for U.S. Customary

projects (1:1 for metric projects). From the Settings Manager, select **Proposed Text and Dims > Standard Text (Normal).** This sets your text attributes.

Step Seven: Paste the Selected Text

While your **Text Editor** has focus (active), type **Ctrl+V** to paste the notes into the window or *Right Click* to bring up the "Right-Click Menu" and select **Paste** (Figure 4-28).

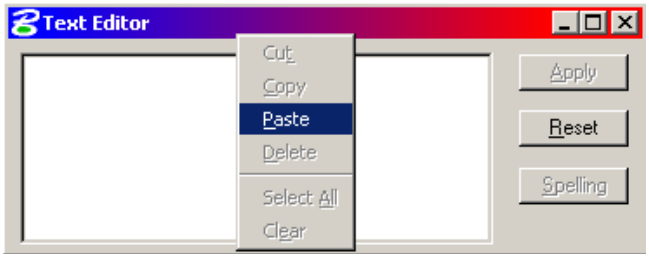


Figure 4-28: Right Click with mouse - Paste Option

Step Eight: Placing Text in the File

Place the text as you would any other text (*Datapoint)* utilizing *AccuDraw* and/or tentative snaps to place it accurately.

If the text you pasted will not fit inside of your border, use the *Edit Text* tool and click on the text. In the *Text Editor* dialog, select the extra text that isn't fitting within the border starting from the bottom up and type **Ctrl+X.** This will "cut" the extra text to the Clipboard. Click *Apply* to accept the changes. Click on the *Place Text* tool. With your cursor in the *Text Editor* dialog, type **Ctrl+V** to paste the remaining text. Place it down using *AccuDraw* to place it accurately. Continue until all of the text fits within the border. Create a second sheet if necessary.

ⓘ ***If you have over 200 lines of text, the text block may not display when you do a fit view. This is normal due to the limitations of multi-line text (text nodes). Zoom in to see the text.***

Step Nine: Editing Text

Edit text like you would any other text by selecting the **Edit Text** tool from the Main tool frame.

CONSTRUCTION NOTE SHEETS

Introduction

Depending on who generated the construction notes, you may be working with an Excel Spreadsheet, reports generated from MX software or hand written hard copies.

These instructions are not intended to explain how to use Excel, but instead, it explains how to take a construction note file and paste it in to MicroStation.

If you are using reports generated from MX, these files are in a **.prn** format. These files can be opened directly using Notepad or the PFE editor. You can select the text and copy it directly into a *Text Editor* dialog for placement. These come in well, but may need adjustments to columns. You can also importing the reports into Excel to provide better formatting abilities.

Importing Reports into Excel (Informational/Optional)

If you are building the spreadsheet from **.prn** reports, select **Data>Import External Data>Import Data** from Excel's main menu. Browse to your workgroups MSTA folder and select the .prn file. Click OK. A text import dialog will open. Select **Delimited.** (Figure 4-29) Click Next.

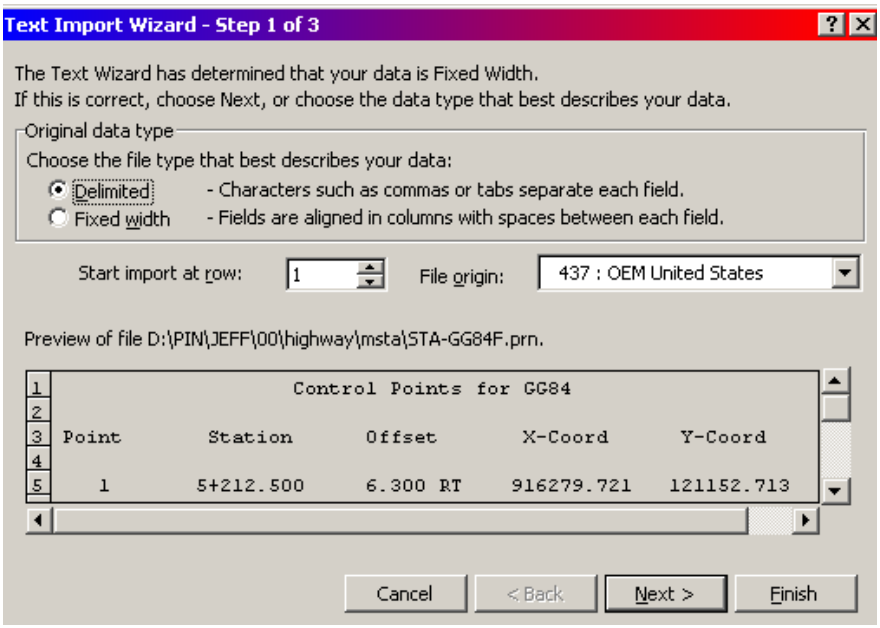


Figure 4-29: Text Import Wizard

In the next dialog, make an additional selection for "Space" as your delimiter (Figure 4-30). The other selections by default do not need changing. Click **Next.**

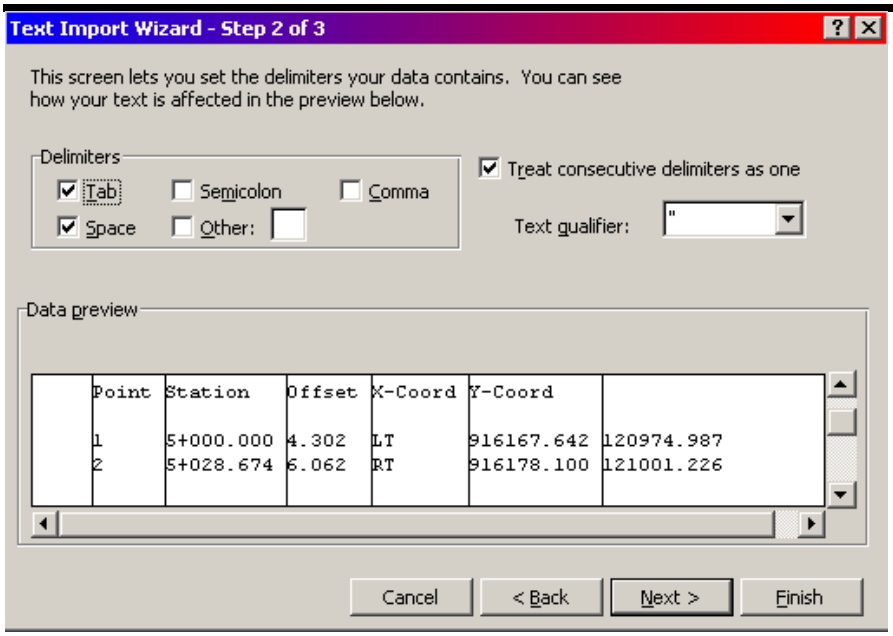


Figure 4-30: Select "space" as your delimiter

In the final dialog of importing text you have the opportunity to format cells in the spreadsheet. "General" is normally good for this setting. If you wish to omit a column, click on the column header and click on the "Do not import column (skip)" button. Click **Finish** (Figure 4-31)**.**

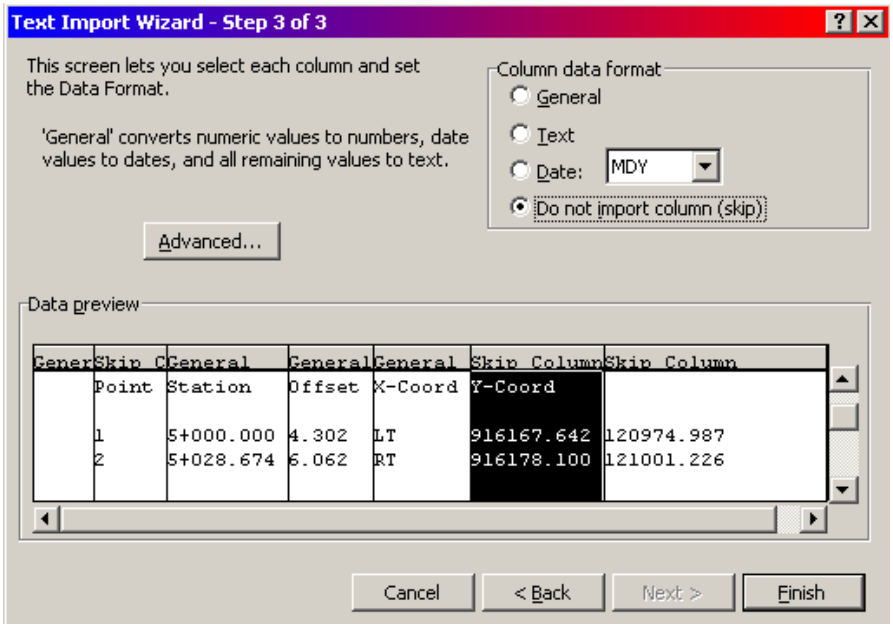


Figure 4-31: Import Wizard column formating

Step One: Open Spreadsheet

Locate and open the spreadsheet (.xls file) in your PIN directory that has the Construction Notes in them.

- Right click in your MSTA folder and select **New>Microsoft Excel Worksheet** if you need to create one. Name it appropriately and add in your information.

Step Two: Save as FormattedText (Space delimited)

If you have to make any changes to the spreadsheet, make the changes and save them.

Select **File>Save As…** from Excel's main menu. Change the *File As Type* pull down to **FormattedText (Space delimited) (*.prn)**(Figure 4-32)**.** Notice that your file name now has a new extension. Click **Save.**

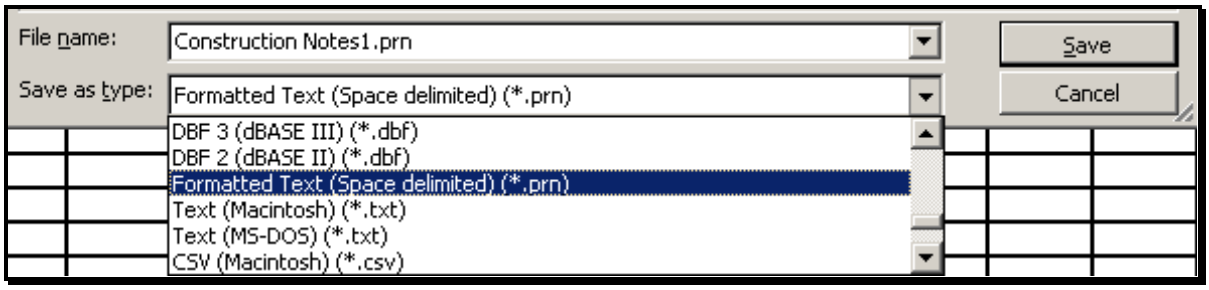


Figure 4-32: Save as Type Text (Tab delimited)(.txt)*

- If you have multiple sheets in one Excel Spreadsheet, you will need to go into each sheet and save them individually as a different file name (i.e. Construction-Note1.prn, Construction-Note2.prn). The .prn format cannot handle multiple pages all at once.
- The .prn extension will allow the user to adjust the widths of the columns in Excel and carry over the changes into the text document (.prn).

Step Three: Warnings

You will get a series of warnings. First one saying the format doesn't support multiple sheets. Click **OK.** (Figure 4-33)

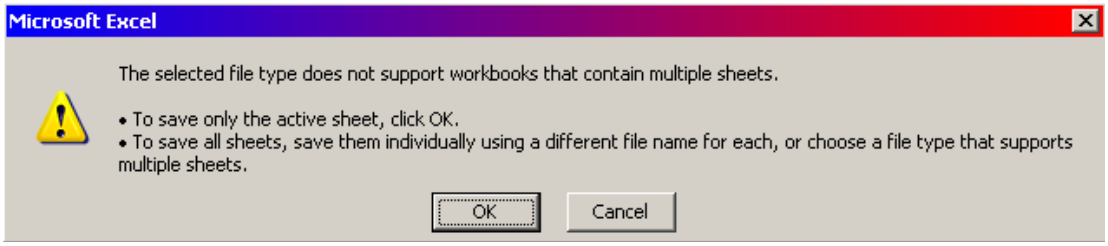


Figure 4-33: Warning One – Click OK

At the next warning click **Yes.** (Figure 4-34)

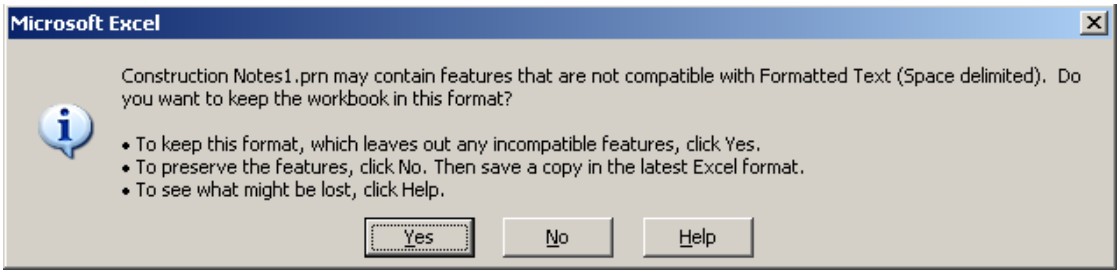


Figure 4-34: Warning Two – Click Yes

Close the Excel session. When asked to save the document, click **NO** (Figure 4-35)**.** You have already created the **.prn** documents as a separate file and do not need to save the changes in the Excel workbook.

ⓘ ***If you had made changes after saving it as a .prn file, do a Save As… and change the "Save as type" back to .xls***

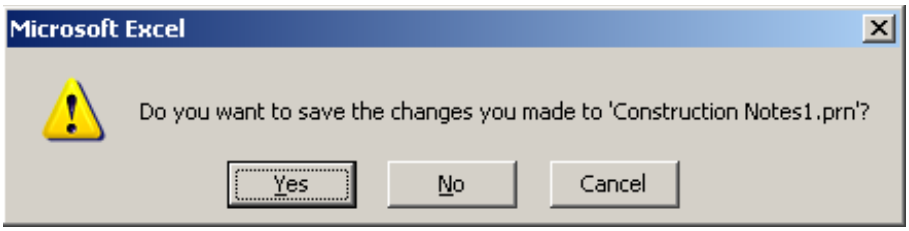


Figure 4-35: Warning when closing the file – Click NO!

Step Four: Open MicroStation

Open MicroStation by double clicking the MicroStation icon on your Desktop and pick your PIN number from the project pull down. Open the MicroStation file that you wish to place the Construction Notes in. If necessary, create a new file from the Main Menu using **File > Makesheetz.** Use a numbered drawing, selecting **Notes** from the drawing type dialog. Consider adding "Construction" in the suffix to better specify the sheet type.

Step Five: Set Your Text Size and Font

Right click on the Settings Manager and select **Category > Scale.** Normally, Construction Notes are placed on a border that hasn't been scaled. Select 12in. = 1 ft. for U.S. Customary projects (1:1 for metric projects). From the Settings Manager, select **Proposed Text and Dims > Monospaced Text.** This sets your text attributes.

Step Six: File Import>Text

Go to **File>Import>Text** from the Main Menu. Select the file that you created with the .prn extension. Place the text with a data point, utilizing *AccuDraw* to place it accurately amongst other notes on your sheet.

Step Eight: Editing the Text

After placement, you will notice that there may be some adjustment necessary. Use the Edit Text tool in your *Main Tool Frame* or use the *Main Menu* and select **Text>Edit Text**. Click the text and adjust as necessary.

ⓘ ***The original .xls file is a handy document because it can be used to generate item lists in your Estimate Book that we turn in to Contracts. It's up to the team as to whether or not you keep the master .xls file up to date or edit the changes within MicroStation only.***

GEOMETRIC SHEET DEVELOPMENT

CLEAN-UP THE GEOMETRY

Introduction

Once the geometry file has been created in MX and is placed in your PIN directory, there is some cleanup required. In the future, we hope this process will be automated by using a macro and/or mapping tables. This section describes how to adjust the line styles of the original drawing to the appropriate style desired in MicroStation.

Step One: Opening and Editing the Geometry

To begin, double click on your **MicroStation** icon and select your project from the project pull down. Open your design file (geometry.dgn) and *Fit View.*

ⓘ ***If design changes are made to curb placement, entrance widths, or other elements in the geometry.dgn, it may be necessary to adjust the in the Highway.dgn file to reflect the same changes to your normal plan sheets. Consider only using certain parts of the geometry file that are unique from the actual proposed design. You could attach the proposed design file (i.e. Highway) to the geometry.dgn and shut off levels that your don't need so that any changes made are reflected on both plan sheets and geometric sheets.***

Part One: MX Enquire

- Turn the Graphic Group lock off (Settings>Locks>Graphic Groups).

Under the **Macro** menu, choose **MX String Info.** An **Enquire** button should pop up (Figure 4-36).

Figure 4-36: Moss Enquire

Press the **Enquire** button.

Click an element to find out what it is called. The attributes of the element you picked will be displayed in a new dialog window.

The **Element Name** is what you are interested in most. If you don't know what the element name is referring to, select **Macros>MX String Search** and type in the name. If the name is recognized, it will display the description.

Go to **Macros > Select By MX Attributes**. Under the **Model** pull down, select the model listed.

- There may be multiple models in your drawing, but normally, there is only one called **geometry.** If there are multiple models, you will have to do this same routine for each and every one.

In the **Name** field, type in the name of the object you wish to have selected. If this element name has numbers in it, supply the characters then use the wildcard "**" after these

characters. This will select all MX elements in your drawing that have the same name. Do not enter a value in the **Object** pull down.

Hit **Select** to pick the elements.

Part 2: Setting the Attributes

The quickest way to set the attributes of an element is to utilize our *Plan Sheet Settings Manager*. Right click on the Settings Manager and pick **Category>Scale.** Select desired scale of your geometric plans normally 1 in. = 25 ft. (1:250 for metric). If what you **Enquired** on represents proposed curb, choose **Proposed Curb, Ret. Wall, GR** from the left side, then choose the type of curb on your project to set the attributes.

Part 3: Changing the Attributes

Click on the **Change Element Attribute** tool in the *Main Toolbar*. Place a check in the **Use Active Attributes** and all of the attributes boxes except for **Class** and **Use Fence** (Figure 4-37). By using the *Settings Manager* in **Part 2,** Level, Color, Style and Weight should be set for you. Click on the screen to change the attributes.

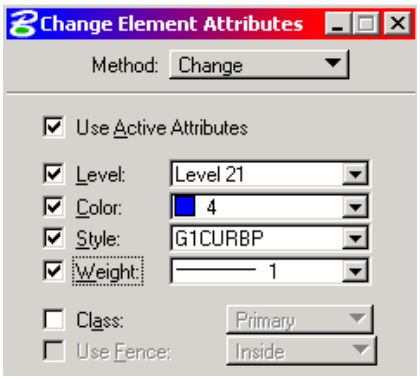


Figure 4-37: Use Active Attributes

Repeat the steps above on all elements that require a custom line style in MicroStation (i.e. retaining walls, curbing, and sometimes, proposed underdrain).

Part 4: Finishing Up

Once all custom line styles are changed to the proper style, all that remains in the active drawing are lines and circles for the geometry.

These lines should be selected and changed to a weight 3. Using the **Edit > Select By Attributes**, check the box to select attributes by weight of "0". Hit **Execute.** Only these should highlight. Now, use the *Change Element Attributes* tool and select only the weight and set the number value to 3. Click on the screen to make the change. Close the *Select By Attributes* and click **Cancel** to stop filtering elements. If you have elements in your file with heavier weights, select them using the Select By Attributes and change them to weight 3 also.

Step 2: Placing Notes from MX Reports

The MX designer can export station and offset reports from MX of the curb locations, curve data, control points and Catch Basin locations. These reports usually have a .prn

extension. They can be read with Notepad or PFE editor or imported into Excel. You have a couple of options for importing them into MicroStation, but it's up to user discretion on which option is best.

- It is a good idea to place them into the individual geometric plan sheets as opposed to the geometry drawing.

Option 1 - Leave these as .prn files and copy and paste them directly into your **Text Editor** after selecting **Proposed Text and Dims>Monospaced Text.**

Option 2 - Open/Import them into Excel as to better enable a user to use this information for generating estimate computations for items that will be used in the Engineer's Estimate book, then save them as a tab delimited *.txt file and import them through MicroStation's *Main Menu* **(File>Import>Import Text).**

✓ *Refer to page 4-37 for the documentation on creating Construction Notes.*

We have a couple of grid boxes available that can be used to group your data. From the *Plan Sheet Settings Manager*, select **Geometric Plans>Control Point Box** and/or **Curve Data Box.**

- Open each individual geometric plan sheet (i.e. 021_geometry.dgn) and paste your notes directly into the border drawing.

Step 3: Annotating Point Numbers

Use the *Plan Sheet Settings Manager* and select **Proposed Text and Dims>Standard Text Normal** to place text for the point numbers. If the circle for the points weren't added to the geometry.dgn, you can place them manually from the *Settings Manager* by selecting **Geometric Plans>Control Points.** Drop the cell and edit the text using the *Edit Text tool.*

CREATING GEOMETRIC PLANS

Geometric plans are required if you have granite curb (Type 1 Curb) or concrete curb (Type 2 curb) on your project.

Step One: Open the geometry.dgn

To begin, double click on your **MicroStation** icon and select your project from the project pull down. Locate the **geometry.dgn** that is in your groups MSTA directory. This file is produced from MX so if it doesn't exist, asks your designer to create one and place the file into your PIN directory.

Flatten this file because it is still 3D. Select **Macros>Flatten** from the *Main Menu.*

Step Two: Reference hdplan.dgn and Alignments.dgn

To reference the files needed for your geometric plan sheets, select **File > Reference (DOT) > Attach**.

Select hdplan.dgn. Click **OK**.

This brings up the **Attach Reference File** dialog. Add a **Logical Name** of hdplan.dgn for the file.

Attach your file by **Coincident - World (Global Origin Aligned with Master File).**

Select **True Scale.** Set the *Nested Attachments* to **No Nesting.** Click **OK.**

Repeat this process for the alignments.dgn.

✓ *Check page 2-71 for an explanation of Reference File Nesting.*

Click **Fit View** (Figure 4-38) to see your reference files.

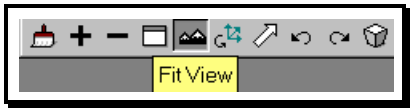


Figure 4-38: The Fit View Button

Step Three: Merging the Clip Boundaries into the Geometry File

In order for the next procedure to work, we need to merge the clip boundaries into the active file. This will produce the geometric plans that look identical in orientation to your normal plans sheets. This procedure is assuming that you want a geometric plan for every plan sheet. If you only need a geometric plan for specific areas on your project, place clip boundaries manually in your active file as you would when creating the normal plan drawings.

✓ *Refer to the procedure on page 5-3 to place clip boundaries manually.*

In the Reference File dialog, highlight the reference file (hdplan.dgn) then select **Tools>Merge Into Master** from the Menu Bar. Now you will be prompted to select a view. Click a *datapoint* in your view. An informational dialog will open telling you that you are

about to merge one reference file into the current design file. This is what you want to do. Select **OK** to start the procedure. Refresh your window to update the view.

Step Four: Make Geometric Plan Files

From the *Plan Sheet Settings Manager* select **Create Plan Sheets > Create Cut Sheets**. This macro is doing a number of things. First off, it is creating saved views in geometry.dgn that are aligned with the clip boundaries you just merged in or just placed. It asks you what number you want to use for the starting number of the geometric plan sheets. If you know where the sheets will fall in your plan set, enter this number here. The default will be eleven. (Figure 4-39) If you don't know yet where they will fall, use the default and we will utilize the **Sheet Renumbering** routine to organize the files outside of MicroStation.

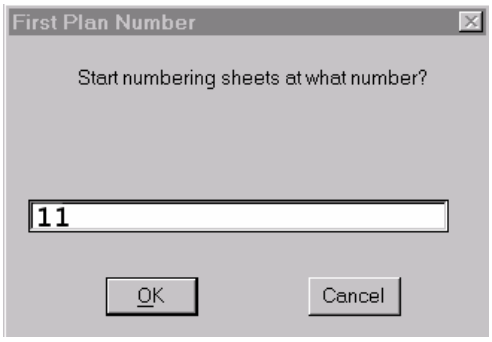


Figure 4-39: Start Numbering At?

When the program finishes, it will drop you back into geometry.dgn. Open up the files you've just created and see how they look!

Troubleshooting

If you open a geometry plan sheet drawing and the graphics within the sheet are not correct, it could mean a couple of things. Try re-cutting the sheets. It won't be necessary to place new clip boundaries, simply select **Create Plan Sheets > Create Cut Sheets** and run through the process of attaching the saved views again. This will correct the problems most of the time.

It could also mean that a drawing that is referenced is not at the same *Global Origin* as the other drawings. See CADD Support for assistance if needed or read the documentation on Flattening drawing and shifting the global origins.

Adjusting Saved Views

You can adjust the area of a reference file on your plan sheet by using the reference file dialog **Tools** in combination with *Move, Scale or Rotate* commands. Be sure to highlight all of your reference files prior to adjusting.

To expand the area of your original saved view, place a fence around your sheet frame and highlight all of the reference files. Choose **Tools > Clip Boundary.**

Place a fence and use the **Tools > Clip Mask** to remove parts of the reference files that may be in your Title Box area.

Re-sheeting

It is possible to use the macro to recreate these sheeted drawings. The macro will prompt you to overwrite duplicate files.

However, it is not capable of only sheeting up one or two sheets—it's all or nothing. If you need to make a change to geometry.dgn (move a clip boundary, add a clip boundary, etc.) you're going to have to go through the process of sheeting again.

Just a reminder, it can only sheet up files in the order that the clip boundaries were placed in the file. If you need to add sheets at the beginning of the project, it might be easiest to delete all your clip boundary cells that you placed and start again from scratch (using *Settings Manager* **Create Plan Sheets > Place Clip Boundary**).

Chapter 5 Roadway Sheets

ROADWAY PLAN SHEET DEVELOPMENT

CREATING ROADWAY PLAN SHEET DRAWINGS

Step One: Open your group's ??plan.dgn

Open MicroStation and choose your PIN.

✓ *Refer to page 1-17 for more information on opening files.*

Locate the **??plan.dgn** that is in your groups MSTA directory (i.e. hdplan.dgn, bdplan, geoplan envplan, etc).

Step Two: Reference in Survey Data

From the main menu, choose **File > Reference** to open the **Reference** dialog.

Check to see that the appropriate files are attached to this drawing (i.e. contours, topo, points, and text). Wetland data will eventually be in a file called **wetlands.dgn.** If it exists in the topo directory, attach it.

By default, all Survey files should be attached. If these files are not attached, you will have to attach them manually. To reference all files needed for you plan sheets into this file, select **File > Reference (DOT) > Attach**. Browse to the **Topo** directory of your current project (Figure 5-1).

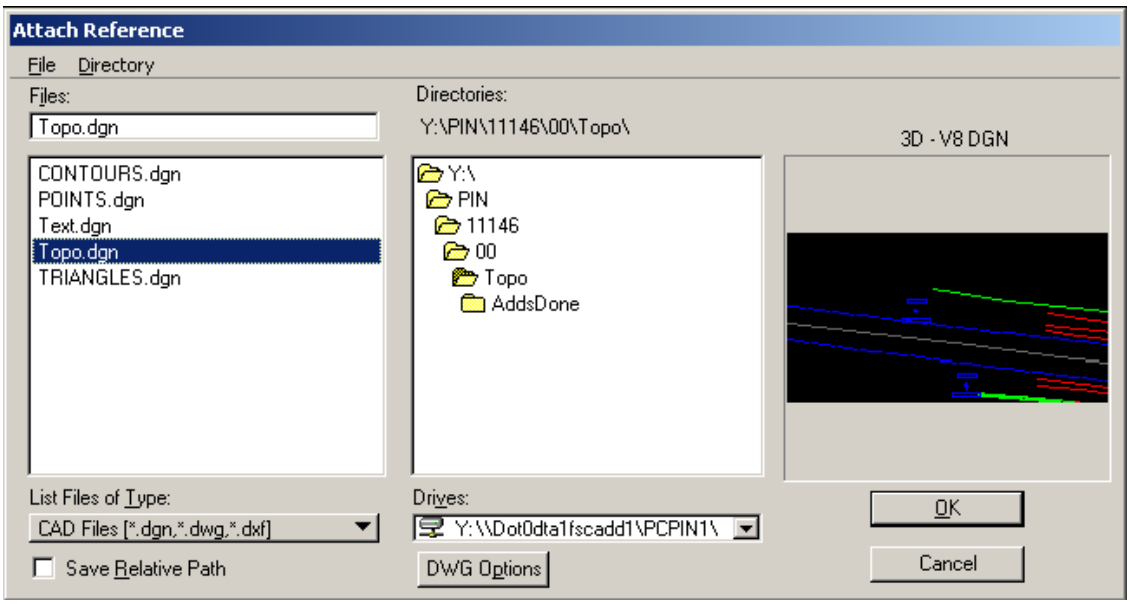


Figure 5-1: The Topo Directory

ⓘ ***It is important that you attach files from the topo directory and not the survey directory. The files in the survey directory are to be used as backups for the survey section only.***

Pick any one of these files from the **Topo** directory and push **OK**.

This brings up the **Attach Reference Settings** dialog. Below file name and path is the Model drawing that you will be attaching. Typically this will show the attachment of the **Default** model.

Next, type in a **Logical Name** (either "topo", "contours", "text", "wetlands" or "points") for the file.

Now pick **Coincident – World** as your Orientation. This will always line up your drawings based on the coordinates of those files.

Leave the **Scale (Master:Ref)** set to 1:1 and **True Scale** checked on.

If the **Nested Attachments** area grays out on you then that is a good indication that there is no files attached to the file you are currently attaching. If this portion does not gray out then you will need to set this to **No Nesting** or change the **Copy Attachment Depth** value to **0** (Figure 5-2).

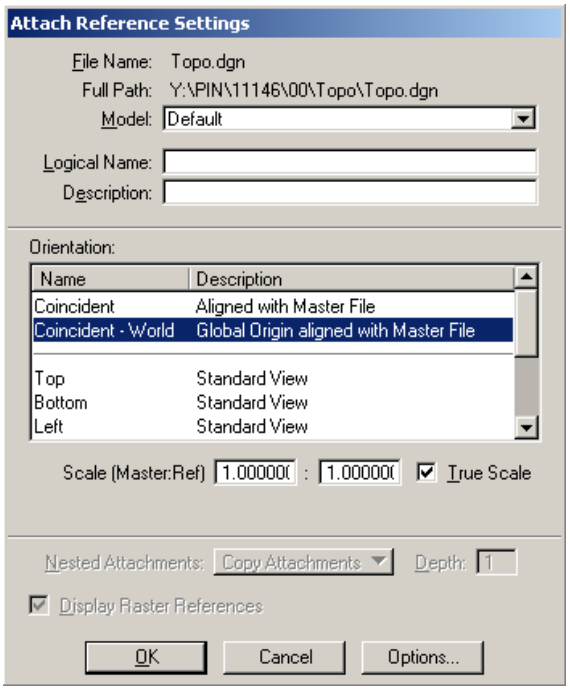


Figure 5-2: Reference Settings

✓ *Check page 2-70 for an explanation of Reference File Attachment settings.*

Push the **OK** button.

Now repeat these steps until you have attached all the survey files you need to attach.

Step Three: Attach Proposed Design and Alignment

If the plans you are creating require the proposed design and alignment, attach them using the same method as above. Depending on type of project, bridge or highway, browse to the necessary workgroups \MSTA folder and attach the two files.

Push **Fit View** (Figure 5-3) to see all your reference files.

Figure 5-3: The Fit View Button

ⓘ ***If you fit view and the graphics zoom way out and does not maximize in your view window, there may be some problems with a file or files that you have attached. Attempt to correct this before you continue. One common problem is that maybe you attached the file base on Coincident instead of Coincident – World. Shut off the display of your reference files one at a time, fitting view after each one is shut off to try and isolate which file is causing the problem. Once you have isolated the file in question, detach and try reattaching based on the method described previously.***

Step Four: Place Clip Boundaries

At this stage we are going to be placing rectangles along the alignment that will correspond to our sheets. We will be using the *Plan Sheet Settings Manager* to accomplish this. If it isn't loaded already, go to **Setting > DOT SetMgrs > Plan Sheet Settings.**

✓ *Check page2-20 for an introduction to the Settings Manager.*

Part One: Set the Category Scale

Right Click the **Settings Manager**, choose **Category > Scale** and set your scale (i.e. 1 in.=25 ft. or 1 in.=50 ft. for U.S. Customary projects or 1:250 or 1:500 for metric projects).

Part Two: Place the Cells

From the *Settings Manager,* select **Create Plan Sheets** > **Place Clip Boundary**.

This selects our sheet boundary cell and activates a cell placement command that will make it easy to place a bunch of these rectangles along the alignment.

Notice the box on the end of your cursor. When you send a *Datapoint* to MicroStation, the box will be placed at that location.

♫ It's best not to snap to elements in your file. If the two elements you snap to are at different elevations, you might end up with a slightly skewed view.

The box you just placed will immediately begin to rotate by the origin point (the point you just entered.) Move your mouse around and notice how it spins. When it is aligned with the roadway, enter another *datapoint* and it will immediately prompt you to place the next boundary.

♫ Don't worry if they're not in exactly the right place. You can go back and clean up any placement later by using the move and rotate tools.

ⓘ ***It is important that you place these boundaries in the order that you want your sheets to be numbered. We have a routine that automatically creates the plan files for us, and it will number them in the same order that you place these clip boundaries.***

Step Five: Placing North Arrows

Start by rotating the view to “top” if not already in a top view.

✓ *Refer to page 2-11 for help with view controls.*

From the *Settings Manager,* select **Symbols and Linestyles**> **North Arrow True.**

North is up in your view. It may be necessary to enter 90 degrees in the *Place Active Cell* dialog to orientate the North Arrow to a vertical position. Place the north arrows inside of your clip boundaries in a place that is out of the busy area of your plan (preferably the top center of each sheet).

Step Six: Create Cut Sheets

Now that you have placed all your sheet boundaries, we are going to run a macro that will create new plan files for us. From the *Settings Manager* select **Create Plan Sheets > Create Cut Sheets**. This macro is going to create saved views in ??plan.dgn that are aligned with the clip boundaries we just placed then create new drawings and attach the saved view from the ??plan.dgn.

The macro asks you what number you want to use for the starting number of the plan sheets (Figure 5-4).

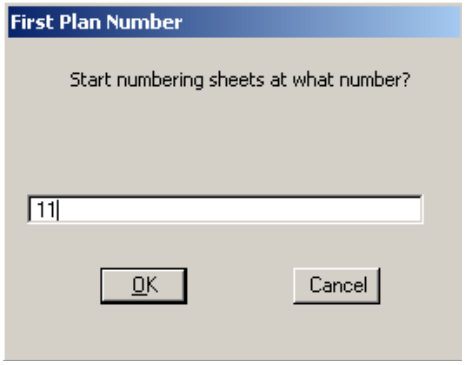


Figure 5-4: Start Numbering At?

- Depending on your workgroup, you may have a different starting numbers by default. The number you see is set based on the estimated number of plan sheets that will be placed before these sheets in your plan package. You do have the option to change this number at this point in the macro if you have a good feel for your plan package set. We will go back later and re-number all the sheets once the complete plan package is ready.

When the program is finished, it will drop you back into ??plan.dgn and fit the view in a top rotation. Open up the files you’ve just created and see how they look!

Live Nesting

What is Live Nesting? This is a new method in MicroStation V8 of attaching a file with references to another file like our border sheets. By using Live Nesting you no longer need to use the old methods of **Batch>Attach** and **Batch>Settings** to manipulate the way you want your cut sheets to appear for plotting purposes. Now if you want to turn off certain levels, adjust displays of reference files or attach/detach additional reference files, you can

simply do this in your source drawing (i.e. HDPlan, BDPlan, etc.) and all of your border files will be displayed in the same manner.

Troubleshooting

If you open a plan sheet drawing and the graphics within the sheet are not correct, it could mean a couple of things.

It could mean that some of the drawings that are referenced in are not at the same Global Origin as the rest of your drawings. See your Support Staff for assistance if needed or read the documentation on Flattening drawings and shifting the global origins.

Or, it could mean that the clip boundary was placed incorrectly. You can fix this without rerunning the "Create Cut Sheets" part of the plan sheet process by following these steps.

1) Open the incorrect plan sheet. Go to **File > Reference** - to open reference dialog.

2) **Tools > Detach All** to detach the existing reference files.

3) Now **Tools > Attach** and be sure to browse to your PIN and select ??PLAN.

4) When the **Reference File Settings** dialog comes up, select the "Saved View" from the Orientation area you need (i.e.. 011) and set Nested Attachments method to **Live Nesting**. Now the saved view will be on your cursor.

5) Set it down as close to being in the center of your border as possible.

- It is not necessary to give a description or logical name.

Adjusting Saved Views

You can adjust (re-define) the area of the reference files on your plan sheet by using the reference file dialog **Tools** in combination with the *Place Fence* command.

Place a fence around your sheet frame and highlight all of the reference files. Choose **Tools > Clip Boundary.** This will expand the area of your original saved view to the extents of your fence.

Also, use the **Tools > Clip Mask** to remove parts of a reference file or files.

Re-sheeting

It is possible to use the macro to recreate these sheeted drawings. The macro will prompt you to overwrite duplicate files.

However, it is not capable of only sheeting up one or two sheets—it's all or nothing. If you need to make a change to ??plan.dgn (move a clip boundary, add a clip boundary, etc.) you're going to have to go through the process of sheeting again.

Just a reminder, it can only sheet up files in the order that the clip boundaries were placed in the file. If you need to add sheets at the beginning of the project, it might be easier to delete all your clip boundary cells that you placed and start again from scratch (using *Settings Manager* **Create Plan Sheets > Place Clip Boundary**).

CLEAN-UP THE PROPOSED ALIGNMENT FILE

Overview

Once the proposed alignment has been created in MX and are placed in your PIN directory, there is some cleanup required.

We will be using a macro to draw the centerline in MicroStation. This will produce true curves and a complex chain that will facilitate measurement.

The MX designer must place the **dab-alignments.prn** file into your projects PIN directory under the MSTA folder. This is the default directory that the macro points to.

Step 1: Open the Alignment Drawing

Open your alignments.dgn design file and *Fit View*.

Step 2: Run the Macro

On the *Settings Manager*, select **Category > Scale** and pick the scale in which you will be printing your drawings. U. S. Customary projects; this is typically one of two scales, 1 in. = 25 ft. or 1 in. = 50 ft. (1:250 or 1:500 for metric projects).

Using the *Plan Sheet Settings Manager*, which should have automatically loaded, select **Proposed Alignment**>**Create Alignment String**.

This opens a dialog that prompts the user to select the dab-alignments.prn file for your project.

- Verify that the default directory is indeed your projects directory. If the path is pointing to a project other than yours, exit MicroStation. Open MicroStation by clicking on the icon and select your project from the **Project** pull down.

If your directory is OK, select the file and press **OK** to have the macro draw your centerline string.

Step 3: Adjusting “Flag” Text

The PC’s and PT’s may need to be rotated 180 degrees so that they are easy to read if looking from the rightmost edge of your plan sheet and may need to be moved.

To do this, use the **Rotate** tool in the main toolbox, set the mode to **active angle** and set your angle to 180 degrees. Move into position using the **Move Element** tool.

If the flag line requires trimming, use the **Extend Element** tool.

Step 4: Placing Curve Data

Open dab-alignments.prn

The curve data exists in the same file that the macro used to run to generate the centerline string. Using *Windows Explorer,* browse to your PIN directory. Open the **dab-alignments.prn** file.

♫ You may get a dialog that asks you what program you would like to use to open this file. Choose either PFE32, or Notepad**.** Check the box to "Always use this program to open this file".

Place and Edit the Curve Data Cell

From the *Settings Manager,* select **Proposed Alignment>Curve Data Cell.**

Place it between your PC and your PT with a *Datapoint.* Now the cell is dynamically rotating around your cursor. Click again to finish rotating it correctly.

Depending on what text editor you are using you may or may not need to drop the cell to edit the text. We will assume you are using the standard text editor.

Once you drop the cell **Qualities>Drop>Complex),** use your **Edit Text** tool and either type or copy and paste the information into the text editor dialog from the **dab-alignment.prn** file.

Step 5: Placing Bearings

To place your bearings, choose **Proposed Alignment > Centerline Bearings** from the *Settings Manager*. *Datapoint* on a tangent line.

ⓘ ***Be sure that your proposed centerline highlights, as opposed to the existing centerline string located in the topo.dgn.***

The resulting label shows both distance and bearing. All we want to display is the bearing. Remove the distance by using the **Edit Text** tool. *Datapoint* on the distance/bearing label to open the **Dimension Text** dialog (Figure 5-5).

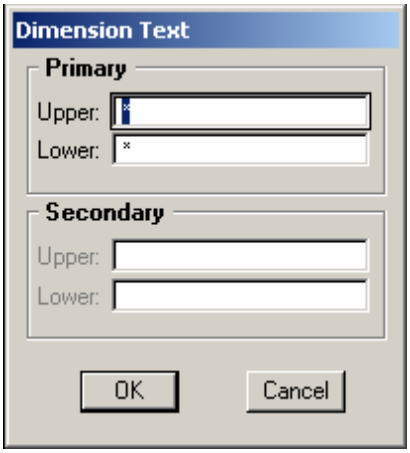


Figure 5-5: Edit Dimension Text

Replace the "*" in the **Upper** field with a space.

ⓘ ***You can't just delete the "*".***

Hit **OK** to apply the change.

Verify that the bearing matches the bearing in your **dab-alignments** file. If it doesn't, edit the text and supply the value from the **dab-alignments** report. This is the correct bearing for the centerline.

- Due to the current working units of the drawing cube in MicroStation, there is not enough precision to accurately formulate the bearings.
- If the bearing you placed is upside down compared to the centerline text, drop the dimension **(Qualities>Drop>Dimension)** then rotate the text 180 degrees.

Step 6: Flatten the Drawing

Go to **Macros>Flatten.** Click **OK** to accept 0 as the desired elevation. Click a data point anywhere in the view window to initiate the command.

EDITING THE PROPOSED DESIGN (I.E. HIGHWAY.DGN OR BRIDGE.DGN)

MX produces most of our proposed design files (i.e. highway.dgn or bridge.dgn). The file is in a very raw format. There are a handful of elements that require adjustment to their linestyle. Some of them are *cut lines, fill lines, ditch lines, curbing, retaining walls, guardrail and possibly drainage lines.* This section describes how to select like lines and make adjustments "Globally" to set the appropriate symbology of the elements in MicroStation.

Step 1: Identify Elements Using MX Enquire

Under the **Macro** menu, choose **MX String Info.** An **Enquire** button should pop up (Figure 5-6).

Figure 5-6: Mx Enquire

Press the **Enquire** button.

ⓘ ***Turn the Graphic Group lock off.***

Click an element to find out what it is called. The attributes of the element you picked will be displayed in a new dialog window (Figure 5-7).

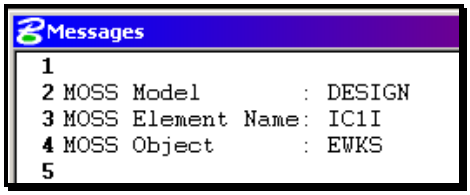


Figure 5-7: MX Enquire Message display

The **Element Name** is what you are interested in most; however, the name may not be clear as to what it represents. Go to **Macros>MX String Search** and enter the "Name" of the element. If this element name has numbers in it, supply the characters then use the wildcard "**" in place of the numbers. If the Designer used standard naming convention for the MX elements, the *Name* of the element should be displayed in the dialog giving you a better idea what the element might be. The designer may also be able to give you some insight on what he or she named the elements.

Go to **Macros > Select By MX Attributes** (Figure 5-8).

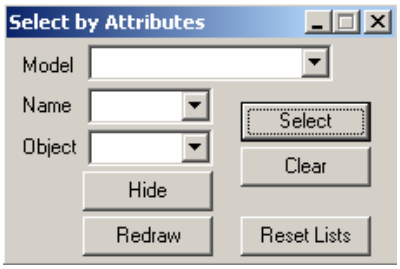


Figure 5-8:Select by MOSS Attributes

Under the **Model** pull down, select the model.

- There may be multiple models in your drawing, but normally, there is only one called **Design.**

In the **Name** field, type in the name of the object you wish to have selected. If this element name has numbers in it, supply the characters then use the wildcard "**" in place of the numbers.

Hit **Select** to pick the elements. This will select all MX elements in your drawing that have the same name.

Step 2: Setting the Attributes

The quickest way to set the attributes of an element is to utilize our *Plan Sheet Settings Manager*.

On the *Settings Manager*, select **Category > Scale** and pick the scale in which you will be printing your drawings. U. S. Customary projects; this is typically one of two scales, 1 in. = 25 ft. or 1 in. = 50 ft. (1:250 or 1:500 for metric projects).

For example, if what you **Enquired** appears to be a proposed slope line, choose **Proposed Slope Lines>Cut Line** or **Fill Line** to set the attributes.

ⓘ ***If you find that the cut and fill lines are not sized correctly then you should verify you Category>Scales is set correctly from the Settings Manager prior to selecting any thing in the Settings Manager.***

- All of your slope lines may be named the same; therefore they will all be selected and changed to the attributes of a cut line or a fill line. Select the slope line type based on what the majority is for your project.

The name "IC" means interface cut. The name "IF" means interface fill. If proper naming was used, you should be able to pick them individually.

Step 3: Changing the Attributes

Click on the **Change Element Attribute** tool in the main toolbar. Make sure **Method** is set to **Change** and place a check in all of the other attributes boxes except for **Class** and **Use Fence**. By using the *Settings Manager***,** Level, Color, Style and Weight should be set for you. Click on the screen to change the attributes.

Repeat the steps above on all elements that require a custom line style in MicroStation (i.e. Ditch arrows, slope lines, retaining walls, curbing, and sometimes, proposed underdrain).

Step 4: Finishing Up

Once all custom line styles are changed to the proper style, all that remains in the active drawing are lines that represent the travel way, edge of shoulder, back of sidewalks and boundaries of entrances, etc.

These lines should be selected and changed to a weight 3. Using the **Edit > Select By Attributes**, check the box to select attributes by weight of "0". Hit **Execute.** Only these

should highlight. Now, use the *Change Element Attributes* tool and select only the weight and set the number value to 3. Click on the screen to make the change. Close the *Select By Attributes* and click **Cancel** to stop filtering elements.

Step 5: Flatten the Drawing

Go to **Macros>Flatten.** Click **OK** to accept 0 as the desired elevation. Click a data point anywhere in the view window to initiate the command.

PROFILE SHEET DEVELOPMENT

PROFILE DRAWING GENERATION

Discussion

To work on the Profile drawings, they must first be generated from Mx and placed in your projects PIN directory on the Y: drive. Typically, there are two standard scales for profiles, 1"=25' scale and 1"=50' scale (1:250 or 1:500 metric). Find out which scale was used to generate the profiles.

Rename file to look alike (Optional)

Use your *Windows Explorer* to browse to your PIN directory and browse to your workgroups MSTA folder. The majority of the files should have names like *PROF-DESIGN-MC10_dr_002.dgn.* When MX creates these files using the wizard, it doesn't add part of the filename to the first file.

Rename this file **(File>Rename)** in *Windows Explorer*, adding **_dr_001** to the end of the file name.

Step One: Symbology Correction

Drawings that have been processed from Mx to MicroStation are now full-size and the standard border is already placed. The only issue is the symbology of our borders comes over as gray.

- All Profile drawings need to be processed, if you see that the borders are gray, process these files by selecting **Macros>Fix Borders (XS/PROF)** from the main menu.

ⓘ ***If you did receive Profile drawings from your designer (Mx user) and there were no borders in the files, then please ask the designer to redisplay the drawings in Mx with the appropriate settings for translation.***

When the macro finishes processing the files, it will open the first file.

Step Two: Rename the Drawings

Close out of MicroStation. Using the "Sheet Renumbering Utility", organize the sheets, using placeholders if necessary, so that the profiles are after the plan sheet. This will add the number prefix to the drawings. If you do not do this, you will not be able to take advantage of automatically filling in the variables in the drawings (Editing the PCF).

✓ *Check page 1-22 for instructions for using the Sheet Renumbering Utility.*

Step Three: Edit the PCF File

"Project Configuration files" are files that contain project specific information that will be used by a macro to substitute project information for variables into your Border. Any text on the border that has a "$" is a variable. Examples of variables are *Town or City, Street or Rte, PIN, Project Number.*

✓ *Refer to page 1-25 for complete instructions on Editing the PCF file.*

Step Four: Border Information

If you would like to replace the variables in your border, run the Border Information Macro. This is kicked off after editing the PCF file, but it can be run as a separate step.

✓ *Refer to page1-27 for complete instructions on running the Border Information macro.*

More Cleanup

Using the profile *Settings Manager*, place all dimensions; text and symbols required on your profile drawings using the **Profile** *Settings Manager*. Refer to a sample set of profiles, your Plan Development Guide or Highway Design Guide for what is required and to see how they should look. For additional information, contact CADD Support.

CROSS SECTIONS SHEET DEVELOPMENT

WORKING WITH CROSS-SECTIONS

Discussion

To work on the Cross Section drawings, they must first be generated from MX and placed in your projects PIN directory on the Y: drive. Currently, there are only two scales for Cross Sections: 1 in.=5ft. and 1 in.=10ft (1:50, 1:75 or 1:100 metric). Find out which scale was used to generate the Cross Sections.

Bridge Program users only use MX to produce Cross Sections with old ground on them, you can use the **Template** macro to produce the proposed lines on your sections. The macro can be found in the main menu under **Macros>Template**.

✓ *For detailed instructions on using the template macro, refer to page 4-18.*

Rename file to Look alike (Optional)

Use your *Windows Explorer* to browse to your PIN directory and browse to your workgroups MSTA folder. The majority of the files should have names like *XSMC*10*_dr_002.dgn.* When MX creates these files, it doesn't add part of the filename to the first file.

Rename this file **(File>Rename)** in *Windows Explorer,* adding **_dr_001** to the end of the file name.

Step One: Symbology Correction

Drawings that have been processed from Mx to MicroStation are now full-size and the standard border is already placed. The only issue is the symbology of our borders comes over as gray.

- All Cross Section drawings need to be processed, if you see that the borders are gray, process these files by selecting **Macros>Fix Borders (XS/PROF)** from the main menu.

ⓘ ***If you did receive Cross Section drawings from your designer (Mx user) and there were no borders in the files, then please ask the designer to redisplay the drawings in Mx with the appropriate settings for translation.***

Step Two: Rename the Drawings

Close out of MicroStation. Using the "Sheet Renumbering Utility", organize the sheets, using placeholders if necessary, so that the Cross Sections are after the Profile sheets. This will add the number prefix to the drawings. If you do not do this, you will not be able to take advantage of automatically filling in the variables in the drawings (Editing the PCF).

✓ *Check page 1-22 for instructions for using the Sheet Renumbering Utility.*

Step Three: Edit the PCF File

"Project Configuration files" are files that contain project specific information that will be used by a macro to substitute project information for variables into your Border. Any text

on the border that has a "$" is a variable. Examples of variables are *Town or City, Street or Rte, PIN, Project Number.*

✓ *Refer to page1-25 for complete instructions on Editing the PCF file.*

Step Four: Border Information

If you would like to replace the variables in your border, run the Border Information Macro. Usually this is kicked off after editing the PCF file, but it can be as separate steps.

✓ *Refer to page1-27 for complete instructions on running the Border Information macro.*

More Cleanup

Step One: Clean up the file

Using the **Edit Text** tool or selecting **Text>Edit Text** from the *Main Menu,* replace the X+XXX and the Y+YYY with the first and last station numbers on your sheet.

- Complete this procedure to all of your Cross Sections before you start plotting singles.

Step Two: Plotting Existing & Proposed "Singles"

There are many items that need to be plotted on the Cross Sections. Trees, Poles, Buildings, Drainage Features, Underground Utilities and Text associated to each of them. We have a **Cross Section** *Setting Manager* designed specifically for this task that will help keep our files standard. It should be automatically loaded.

- Remember to place these items on the closest possible section.

Right click on the *Settings Manager,* choose **Category > Scale** and select the scale of your Cross Sections (i.e. 1 in.=5ft. and 1 in.=10ft (1:50, 1:75 or 1:00 metric)).

Step Three: Plotting Cells

Some cells are created with origins for the Left and for the Right side of the centerline and some have the origin located in the center of the cell. The trees, for instance, have a bottom center origin, but need to be plotted to the face of the tree, depending on whether it is on the left or the right.

The following is the procedure for plotting singles that have a proper origin.

Go to the left pull down of your *Settings Manager* and choose the category of singles you are plotting. In the right pull down, select the specific cell you want to plot.

You will find that the cell you selected is now on your pointer. With your focus in *AccuDraw, tentative* to one of the centerline tick marks and type an "O" to set your AccuDraw Compass to this point.

Move the cell horizontally in the X direction, either left or right, and type in the offset. This offset will be locked for the time being. Move the cell up or down until you have it positioned on the old ground.

- Snap to the ground using your **Nearest** snap (type **N** into *AccuDraw*).

Some items, drainage and utilities, have their own level for text placement, use the appropriate text associated to these cells from the settings manager (i.e. **Exist. Utilities>Utility Text**). For all other text associated to existing cells, select **Existing Text (Misc)>Standard Text (Normal)** from the *Settings Manager*.

A *Text Editor* window opens and waits for your entry. Enter your text in this field and it will be attached to your pointer, waiting for the user to provide a position on your screen.

If you are cutting and pasting from another program, go to this program, select the text and select **Edit>Copy** or **Ctrl+C** on your keyboard and go back to MicroStation and select **Edit>Paste** or **Ctrl+V** into the **Text Editor** window.

Because the tree cell's origin is at the bottom center of the cell, the user needs to take notice of where the temporary dashed line crosses the existing ground string during placement of the cell. At this point, hit the "L" key twice and it will release the lock in the X direction allowing the user to move the cell horizontally until the face of the tree is aligned where the temporary line that was crossing the existing ground. *Datapoint* to place it.

- Please note that the Survey Section defines the face of the tree closest to the centerline of the road.

Step Four: Manipulating The Template

The Template (proposed design) most likely needs some editing, or at the least, additions. For an example, all cross section on each sheet need offsets to the toe of slope, and cut and fill quantities. There are many ways to do one thing in MicroStation, so we will describe the method we found easiest and fastest.

Part One: Adjusting slopes

When adjusting or modifying a line, set your snap mode to *Keypoint.*

Use the *Modify* tool (**Stretch > Modify**).

Snap to the end of the line, and (using your *AccuDraw* shortcut keys) snap to the new location with a **I** for intersection or provide an offset value by snapping to the centerline and type **O** for origin and slide in the X direction and enter a value. Move in the Y direction until you are near the old ground and hit the **N** on your keyboard then *Snap* to the old ground.

Step Two: Creating slopes.

AccuDraw makes it very easy to create lines at a slope or percentage.

Use the *Cross-Sections* Settings Manager to control the appearance of new lines. From the **Settings Manager**, choose **Template Lines and Symbols > Finished Grade and Slope**. This will set the proper Level, Color, Style and Weight as well as launching the *Smartline* command.

To place a slope specified as "rise / run", snap and *Datapoint* to begin the line. Gesture left or right and type the "run" value of your slope into *AccuDraw*. Gesture up or down and enter the "rise" value of your slope into *AccuDraw*. Type "A", while focus is in *AccuDraw*, to lock the angle of the line. Use a *Nearest* snap and click on the old ground.

✓ *Refer to page 2-51 for a description of using AccuDraw to place lines at a percent slope.*

If you need to trim a slope line to the old ground, use the *Extend Element to Intersection* tool and hit the line you want to extend, and then hit the line that you want it to extend to.

Use the *Construct Circular Fillet* command to place rounded ditch slopes (**Zip > Fillet > Fillet**). In the **Construct Circular Fillet Tool Settings Window** (Figure 5-9) make a guess on the **Radius** of the fillet and set the **Truncate** value to **First**.

Figure 5-9: Fillet Tool Settings Window

This command requires two *Datapoints*. The first point indicates the element that is going to be cut ("truncated"). Pick your proposed slope line. The second point identifies the line to trim the first line to. Pick the existing ground to the outside of the slope.

♫ If you don't like the results, try a different radius.

Step Three: Labeling Slopes

Labeling slopes have been made easier by using the *Settings Manager*. Select **Proposed Text and Dims>Slope%** and snap and *Accept* on both ends of the line you are labeling. The slope will appear in your *Text Editor*. It is ready for placement. *Snap* to the middle of the line and *Accept* to finish the placement.

✓ *For more detailed information about the Slope% macro, refer to page 2-86.*

Step Four: Subgrade and Driveway Cleanup

The rest of the cleanup may consist of drawing subgrade lines for your main line and your drives. Be sure to use your *Settings Manager* **(Template Lines and Symbols)** to control the Level, Style, Color and Weight of these lines. Refer to the Standard Details when adjusting driveways. Use the **Proposed Text and Dims>Slope%** macro to label the driveway slopes.

Chapter 6 Geotech Sheets

Chapter 7 Structural Sheets

OVERVIEW

DETAILING TO SCALE

Introduction

We'd like to make it as easy as possible to draw our structural details. The biggest problem we face in doing this is the issue of controlling text and dimension size relative to plot scale. To make sure we're always drawing 1:1 (full size), we've adopted a workflow that relies on MicroStation's built-in use of reference files, as well as a heavily customized *Settings Manager*.

File Segregation

Let's look at an abutment as an example of how we're going to segregate files. Say we have three sheets for abutment one: a footing sheet, an abutment sheet and a wing sheet. In our bridge\msta\ folder for this project, we will have one .dgn file that corresponds to each of these sheets. They might be named "016_abutment1.dgn" "017_pier_1.dgn" and "018_framing.dgn." These files would be empty except for a border that contains the title block, signature block, etc. All of the detailing work that we've done for this abutment will be other files, which might be called "z_abut_1.dgn", "z_pier_1.dgn" and "z_framing.dgn." These files contain the lines, text and dimensions that make up our details.

Creating A Detailed Drawing

The first step in detailing our abutment is to create the drawing file that is going to contain our lines, text and dimensions.

✓ *Refer to page 1-18 for Creating Drawing Files.*

Now we are ready to do our detailing work. We will discuss this in detail elsewhere, but for now, note that we will be using the *Settings Manager* to control our level, color, style and weight. From the *Settings Manager*, select **Structural Detailing > Abutments** and draw up your abutment plan.

Now it's time to decide what scale we're going to want to plot this plan. Until we have placed text or dimensions on this plan, we can plot it out at any scale. It is the size of text and dimensions that lock us down to a fixed plot scale.

If your *Settings Manager* is docked at the bottom or top of your screen, right-click on it to pop up the menu choices (Figure 7-1).

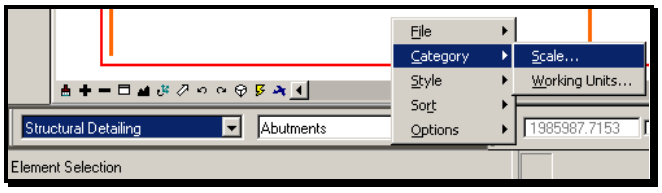


Figure 7-1: Right Click on your Settings Manager

From the menus, select **Category > Scale** to select the working scale for your detail. This brings up the **Select Scale** dialog (Figure 7-2).

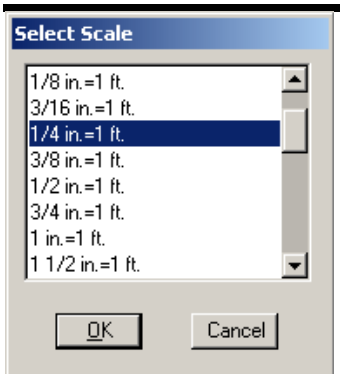


Figure 7-2: Select Scale

Let's select a scale of ¼ in. = 1 ft. and push **OK**.

✓ *Check page 2-23 for more information on the Settings Manager Scale.*

Once you have selected your scale, it is time to annotate your detail. Using the **Prop. Text and Dims > Dimension Ft./In. (1/4 accuracy)** (Figure 7-3), this will setup your dimension sizes and your text size. Finish up your detailing work.

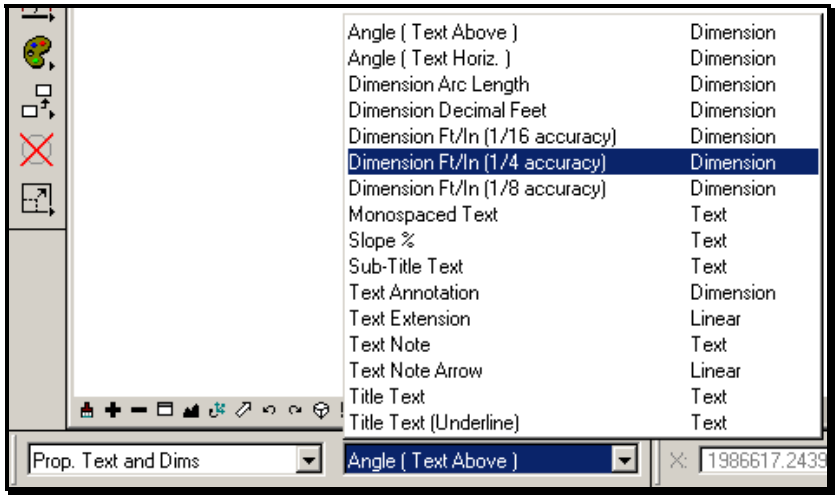


Figure 7-3: The Prop. Text and Dims Group

Once you have finished your annotation, we are going to set up a *Saved View* that contains our detail. From the *Settings Manager*, choose **Tools > Saved View Maker**.

This will run a macro to quickly create a saved view for you. It will prompt you to enter the lower left and upper right hand corners of a box that contains all of the lines and text that make up your detail (Figure 7-4).

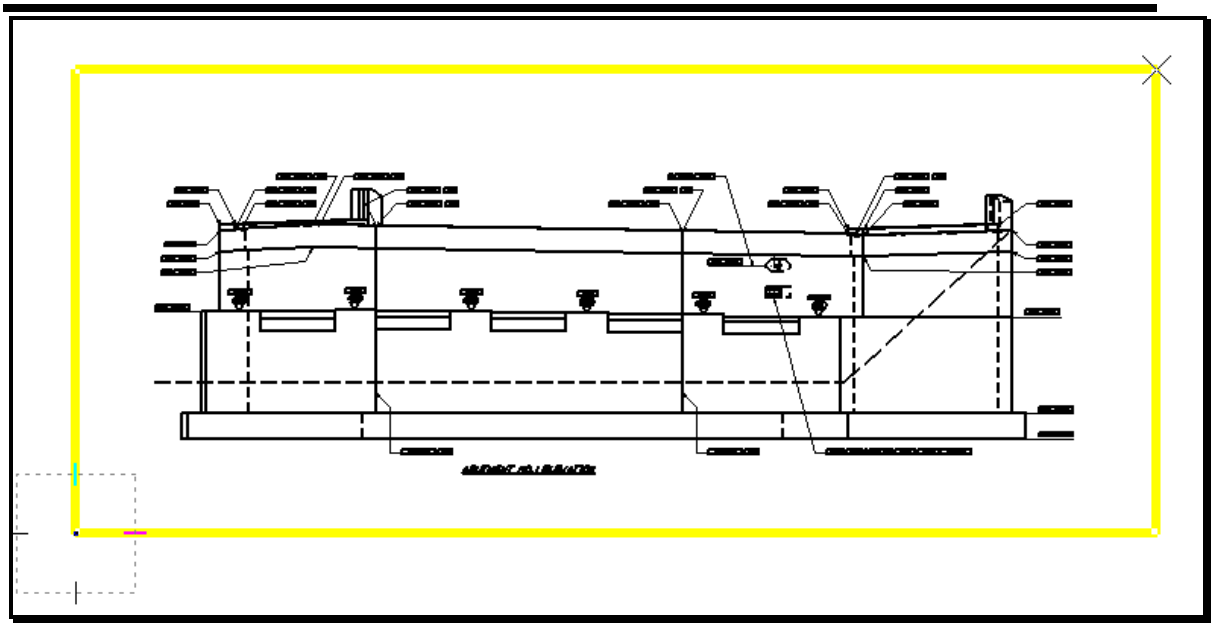


Figure 7-4: Define the Extents of your Saved View

Once you enter in both of these points, the macro will then resize your open window to the aspect ratio of your detail and open up a **Saved View** dialog to ask you for a name and a description of your view (Figure 7-5).

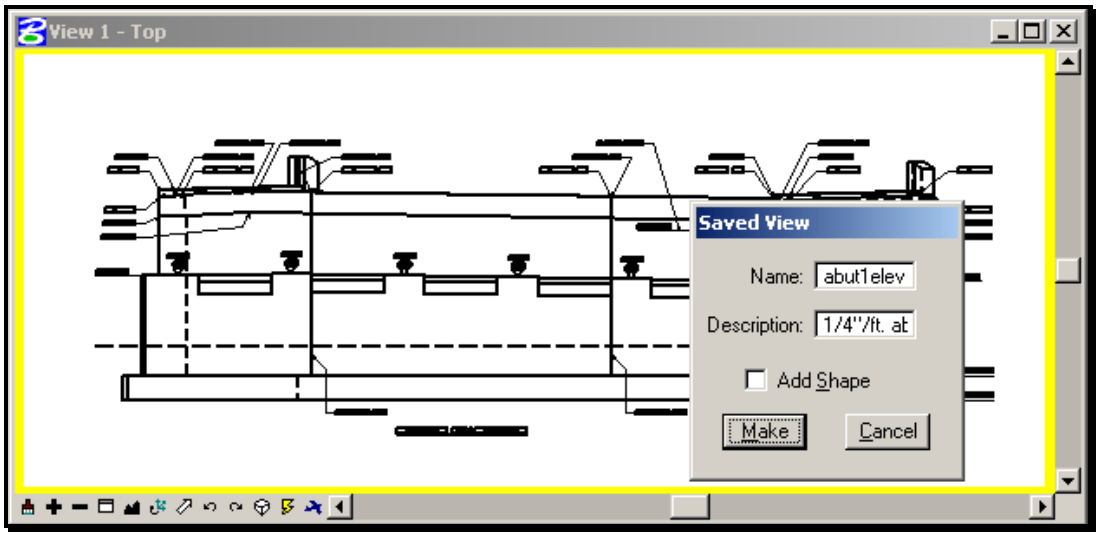


Figure 7-5: Naming a Saved View

- In the description field, make sure to include a reference to the scale of the detail, as you will need that information later.

This completes the work that needs to be done in this file. Now we are going to create a Sheet File and attach our detail to it.

Creating a Numbered Border File

✓ *Refer to page 1-18 for creating your Border File*

Fill in the information in the border by selecting **Macros > Border Information** from your main menu.

- If you find the information on your border to be incorrect then it will be necessary to edit your "Project Configuration File". This can be accomplished by going to the main menu and selecting **Workspace>Edit Project Data (PCF).**

✓ *Refer to page 1-25 for more information about PCF Editing.*

Now it's time to attach our detail to this drawing. Select **File > Reference (DOT) > Attach.**

This will bring up the **Preview Reference** dialog (Figure 7-6).

Select your drawing file and push **OK**.

- Using this selection instead of the out-of-the-box **File > Reference** allows us to go directly to the project directory that we are working in and keeps us from having to browse to the directory.

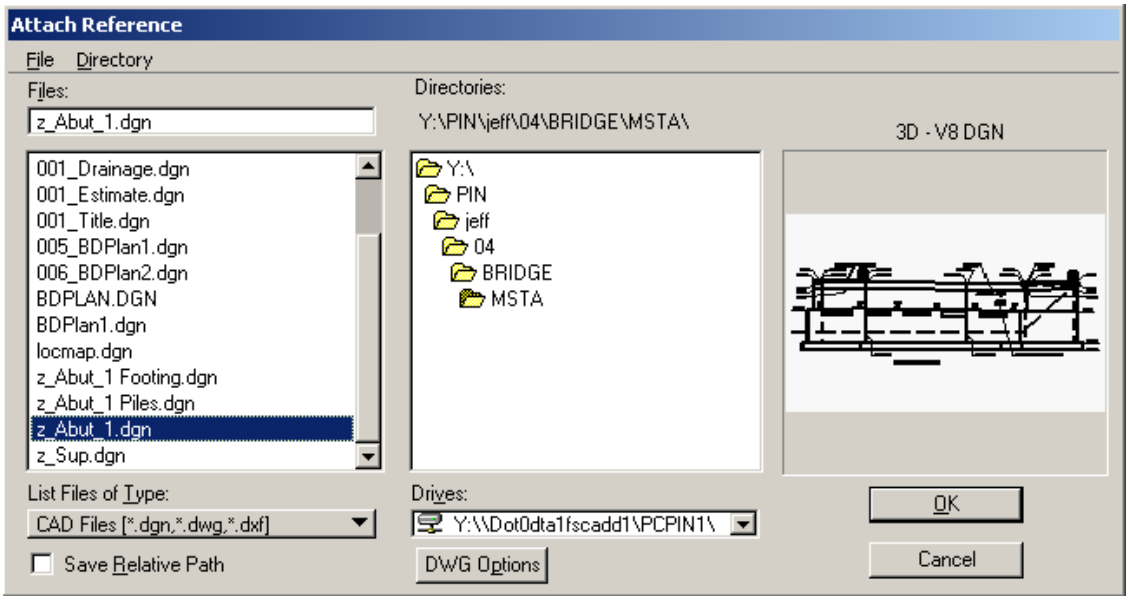


Figure 7-6: The Preview Reference Dialog

This will bring up the **Attach Reference File** dialog (Figure 7-7).

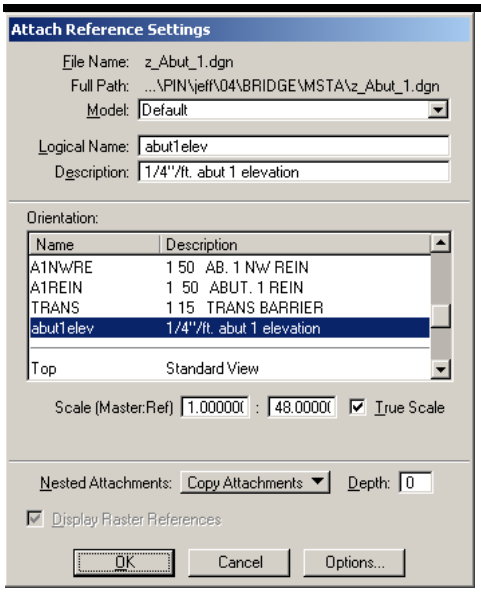


Figure 7-7: The Attach Reference File Dialog

We will need to make a number of selections here. First off, pick your saved view from the **Orientation** portion of the dialog. When picking a *Saved View* you will notice that the *Logical Name* and the *Description* will fill in automatically. Finally, set your **Scale (Master:Ref)** to be equivalent to the *Settings Manager* scale that you used when annotating your detail. (In this case, our ¼ in.=1 ft. *Settings Manager* scale translates to a 1:48 Master:Ref scale.) Push **OK**.

✓ *Refer to page16-2 for the table of U.S. Customary detailing scales.*

This will dump you back into your file with a box hovering on the end of your cursor (Figure 7-8).

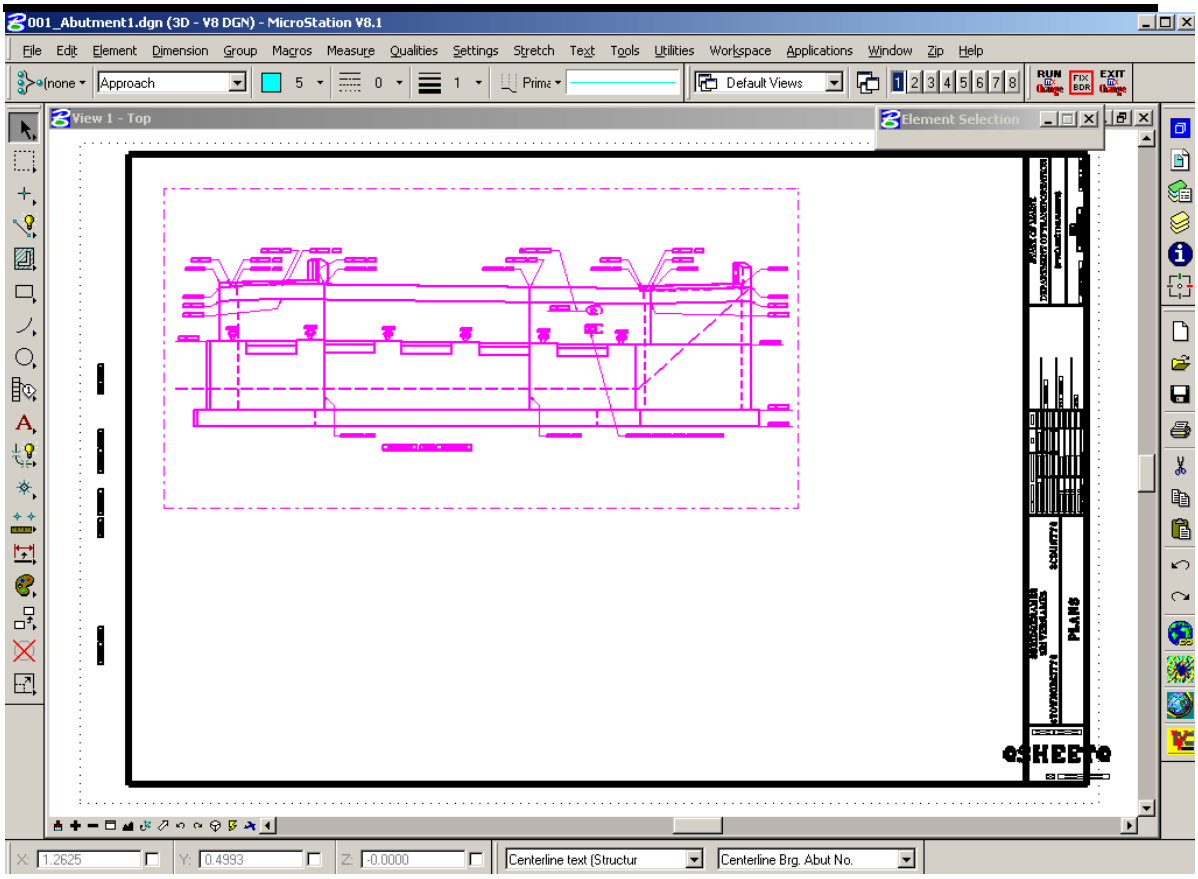


Figure 7-8: Reference Placement by Saved View

Datapoint somewhere on your border to place your detail in an acceptable location.

Adding Further Details, Different Scales

To continue with the previous example, you might go back into your z_abut_1.dgn and create an abutment elevation. Since the abutment plan and elevation may be at the same scale, you should have no trouble working on both of those details in the same file for the life of the project. You would set up a saved view for the elevation and attach that saved view to your 017_abutment1.dgn. Then any changes that needed to be made to those two sections would be made by opening up z_abut_1.dgn drawing file.

However, the abutment section is often at a different scale than the plan and elevation. There are two choices for detailing this section. One method would be to create a new design file ("z_abut1_sect.dgn") and choose something like "1/2in.=1 ft." for the scale. Then draw and annotate as we just explained, creating a saved view and attaching that file to 017_abut1_plan.dgn.

The other method would be to draw the abutment section in the same file as the abutment plan and elevation. Then, when you wanted to place text on the section, you would choose "1/2in.=1 ft." as you *Settings Manager* Scale and reselect **Prop. Text and Dims > Dimension Ft./In. (1/4 accuracy)** to establish the correct dimension and text size for annotating your section detail.

- Remember, this won't affect the text that we've already placed on the ¼ in=1 ft. details. It only impacts text that we are going to place from here on out.

The only drawback to this method arises when you want to add more annotation to the ¼ in.=1 ft. details. You **MUST** select the proper *Settings Manager* Scale before using the *Settings Manager* to place additional text, dimensions, custom linestyles, or cells. This means that as you work on this drawing you will need to continually flop back and forth between scales.

To check your current *Settings Manager* scale, go to the *Settings Manager* and choose **Tools > Plot Scale?** (Figure 7-9)

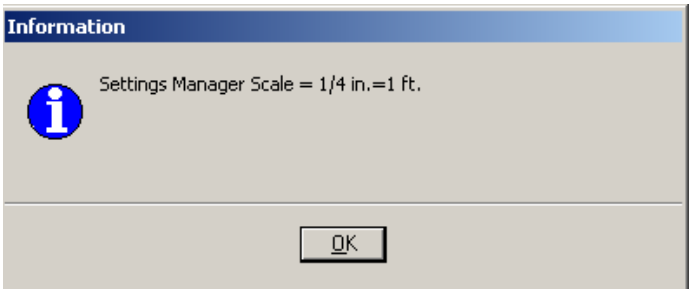


Figure 7-9: Settings Manager Scale Information

TOOLS IN THE SETTINGS MANAGER

The **Tools** section of the **Settings Manager** (Figure 7-10) has a couple useful automation routines.

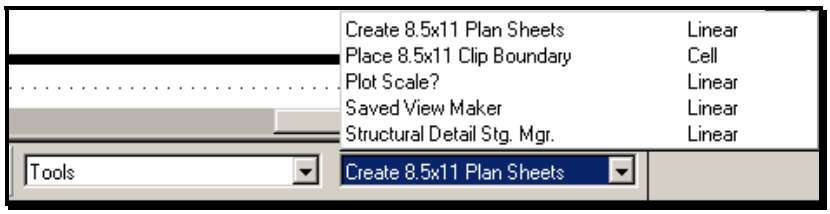


Figure 7-10: Settings Manager > *Tools*

The File Making Macros

File creation has been removed from the Structural Settings Manager. Cut sheets will be created from the **USPlan** *Settings Manager* and all other file creation will be handled through the **makesheetz.bas** macro (**File > Makesheetz**).

✓ *Check page 1-18 for a description of the makesheetz macro.*

- There is a file creating process within the Tools group that allows for developing 8.5 x 11 detail sheets for the purpose of developing Coast Guard permit plans. This works very similar to creating plan sheets. You would use the option Place 8.5x11 Clip Boundary around your specific details and then process them to sheet drawings by using the option Create 8.5x11 Plan Sheets.

Plot Scale

The **Plot Scale?** *Component* reminds you of your current **Settings Manager Plot Scale** (Figure 7-11).

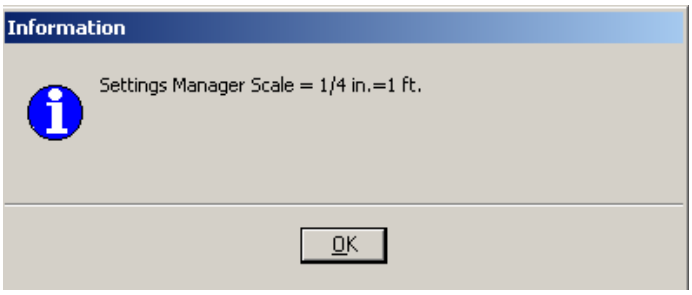


Figure 7-11: Settings Manager Scale Information

Make Saved Views

The **Saved View Maker** is a way of automatically creating a *Saved View* of a specific size and aspect ratio.

Saved Views are a little bit like bookmarks in a MicroStation .dgn file. They help you get back to a specific location in your file by storing the coordinates in a utility called **Saved Views**.

The default way of accessing *Saved Views* is by opening the dialog from the Menus under **Utilities > Saved Views** (Figure 7-12).

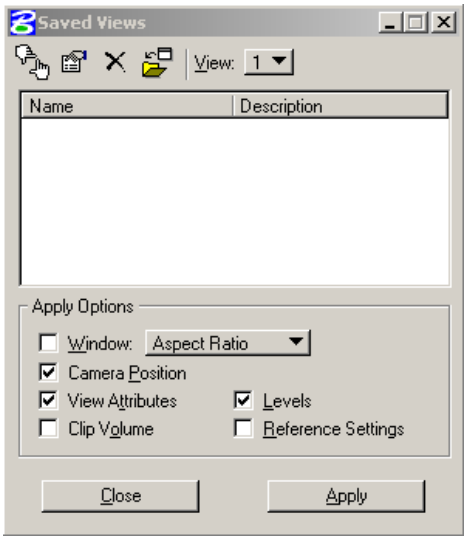


Figure 7-12: Saved View Dialog

Structural Detail Settings Manager

When selecting **Structural Details Stg. Mgr.** you will launch another *Settings Manager* that will allow you to place structural detail cells that have been built into a cell library for you. They are categorized by bridge components.

- If there are any details that you develop while detailing that would be pertinent to be created as cells please contact your support staff to develop and make them accessible to all others.

DIMENSIONS AND THE SETTINGS MANAGER

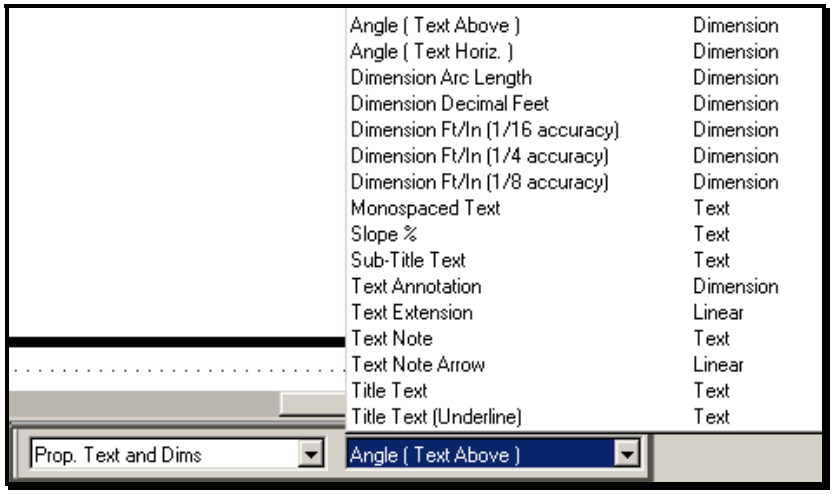


Figure 7-13: Dimensions

Dimensions With Arrows

There are currently four options for placing Dimensions with Arrows.

- **Dimension Decimal Feet** lays out dimensions to hundredths of inch accuracy.
- **Dimension Ft/In (1/16 accuracy)** lays out dimensions to a 1/16” accuracy.
- **Dimension Ft/In (1/4 accuracy)** lays out dimensions to a 1/4” accuracy.
- **Dimension Ft/In (1/8 accuracy)** lays out dimensions to a 1/8” accuracy.

Selection of any of these options will setup your active level, color, style and weight, as well as setting an appropriate dimension text height for your active **Settings Manager Scale**. It will also launch the appropriate tool for dimensioning (in this case, the *Dimension Size Arrow* tool (Figure 7-14).)

Figure 7-14: Dimension Size Arrows Command

Angle (Text Above) & Angle (Text Horiz.)

These Components set us up for dimensioning the angle between two lines. The **Text Above** option places the text in-line with the dimension arc. The **Text Horizontal** option cuts the dimension arc and always draws in text horizontal (Figure 7-15).

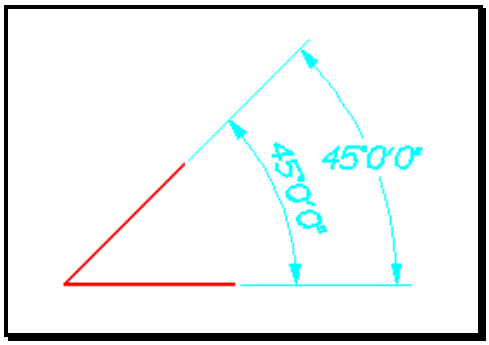


Figure 7-15: Angular Dimension Examples

- This command can be used to dimension obtuse as well as acute angles, depending on the order in which you identify the lines. In the pictorial, I identified the horizontal line first, and then the slanted line and I got the angle that was less than

180°. This is because MicroStation always dimensions angles in a *counter-clockwise* direction, if I had identified the slanted line first, I would have gotten the angle that was greater than 180°.

Dimension Arc Length

This tool allows for dimensioning an arcs length with a radial dimension (Figure 7-16).

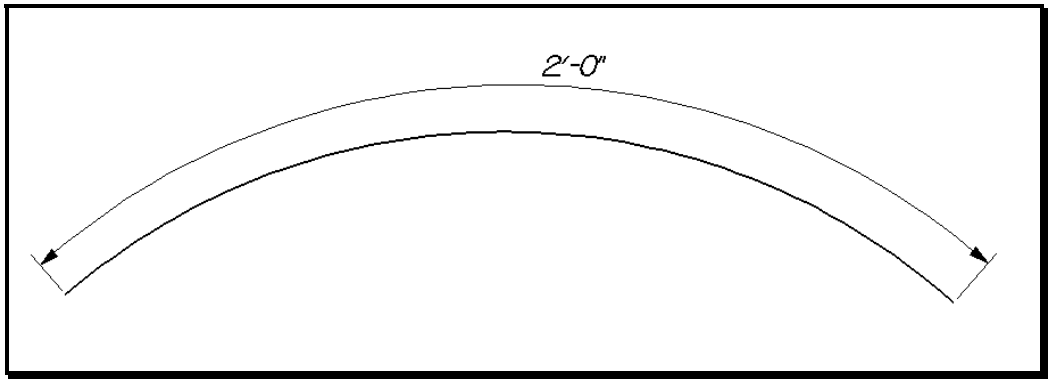


Figure 7-16: Dimension Arc Length

STRUCTURAL DETAILING AND THE SETTINGS MANAGER

The **Structural Detailing** component of the **Settings Manager** (Figure 7-17) is set up to help us control level, style, color, and weight of elements that we place on our drawings as we draw details.

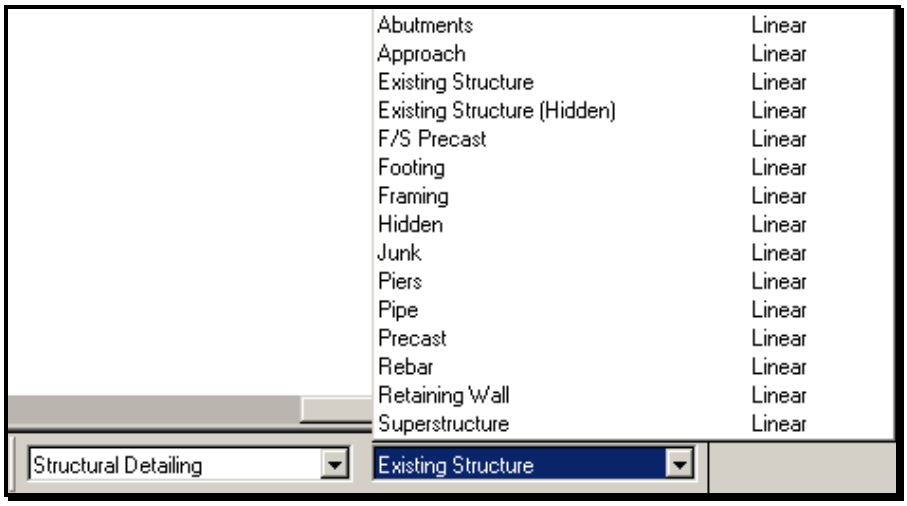


Figure 7-17: Structural Detailing Settings Manager

Nuts and Bolts

Selecting any component from the **Structural Detailing** portion of the *Settings Manager* does a number of things.

Most of the components set you active color, level, style and weight. You can watch these attributes change on your **Attributes** tool box (Figure 7-18).

Figure 7-18: The Primary Tool Box

The only exception to this is the **Hidden** component, which only changes your style to dotted and weight to thin. (This allows you to draw a **Hidden** line of any of the other types: **Abutment**, **Framing**, etc.)

Some Typical Uses

New Elements:

Probably the most common workflow will be simple. Decide what kind of detail you're working on. See which *Component* best corresponds to the work you're going to be doing, and pick that item from the **Settings Manager**. This will set up the proper *Symbology* and level for you.

- *Symbology* is MicroStation's collective term for color, style and weight.

Now choose your drawing commands (place circle, place *Smartline*, etc.,) and start drawing.

Changing Existing Elements:

You'll also use the **Structural Detailing** *Group* for cleaning up elements that may have been drawn wrong. Maybe you constructed lines parallel to a centerline, and now you need to change them to an **Abutment** style.

From the **Settings Manager**, choose **Structural Detailing > Abutments** to set the appropriate level, color, style and weight.

Then, choose the *Change Attributes* tool either from the **Main Tool Frame** or from the Menus (**Qualities > Change > All**). This will prompt you to *Identify Element*. Pick the element that you want to change. (Make sure to *Accept* the change by entering a *Datapoint*.)

Adding New Detailing Types

If there is a detail type that you think needs to be added, please bring it to the attention of your support group.

CHANGING DETAIL SCALE

So you've finished drawing up your detail. You've got it all dimensioned. You've got it all annotated. Now you've changed your mind about what scale you need to use, and all your text, dimensions, and linestyles look wrong.

No Quick Solution

There's no one-step program to fixing this problem. It's going to take some work. But here are the things you need to do:

Scale

First off, let's make sure you pick your new scale. From the **Settings Manager**, choose **Category > Scale** and pick your new scale (Figure 7-19).

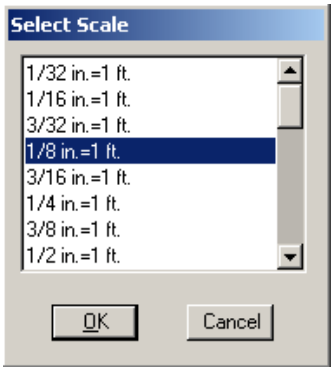


Figure 7-19: Pick a Settings Manager Scale

✓ *Check page 2-23 for more information on the Settings Manager Scale.*

Text

Now let's get the text out of the way. You've already got a lot of text on the drawing; you just need to change it. We're still going to start by going to the **Settings Manager** and choosing **Prop. Text and Dims > Text Note** (Figure 7-20).

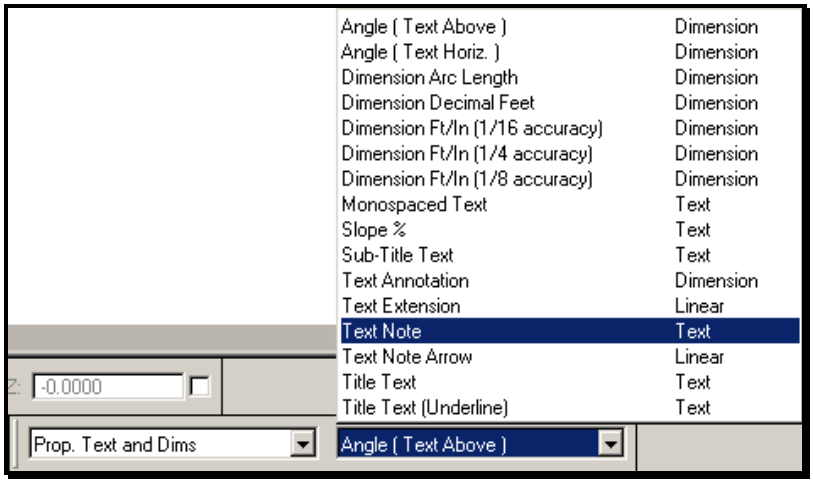


Figure 7-20: Structural Settings Manager

This will open up the **Text Editor** (Figure 7-21).

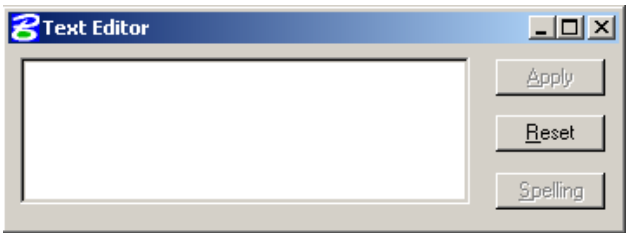


Figure 7-21: The Text Editor

It opens up because that *Component* launched the *Place Text* command. We're not going to use the *Place Text* command, however. Go to your Main Menu and choose **Text > Update Text**. (This is the same as the **Change Text Attributes** command (Figure 7-22) from the **Text** tool box.).

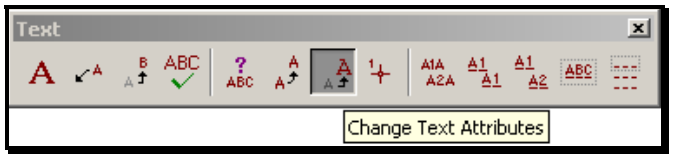


Figure 7-22: Change Text Attributes

This tool is used to change the *Text Attributes* of an existing text item. The status bar will prompt you to "Identify Element." Go around your detailing, picking on all the text that needs to be changed. Or, if you prefer, place a fence that encompasses all of the text items that you want to change and check off the **Use Fence** option in your **Tool Settings Window**. This will let you change a whole bunch of text items at once.

Once that's done, you're going to notice that some of the text doesn't fit into spaces where it used to fit, or text will overlap other text or parts of the detail. This is going to require some cleanup. I recommend the Main Menu **Zip > Move** to move text items back into place. Make sure to use *AccuDraw* to keep them in proper horizontal and vertical alignment.

Dimensions

We're going to use a similar procedure for all the dimensions that need to be changed. First, go to the **Settings Manager** and choose the dimension *Component* that corresponds to the dimension that you need to change.

Once you have selected a *Component*, MicroStation is going to launch a *Place Dimension* command. We're going to ignore that command and go on to select *Update Dimension* either from the **Dimension** toolbox (Figure 7-23) or from the Main Menu **Dimension > Update**.

Figure 7-23: The Dimension Toolbox

This command works very similar to the *Change Text Attributes* command. It will prompt you to identify a dimension to change. Go around your detail, picking on every dimension

that needs to be updated to your current settings. Note that there is no way to change a fence full of dimensions at once. However, you can use the *Element Selection* tool or the *Powerselector* to pick a whole bunch of dimensions, and then issue the *Update Dimension* command to change the whole lot of them.

Linestyles

The last thing that needs to be changed may not be obvious at first. Your Arrow and Bullet linestyles should always be the same size relative to your text. So if your text size changes, you should make sure to change your linestyles as well.

Do this by going to the **Structural Linestyles** *Group* from the *Settings Manager* and picking the linestyle that you want to update (Figure 7-24).

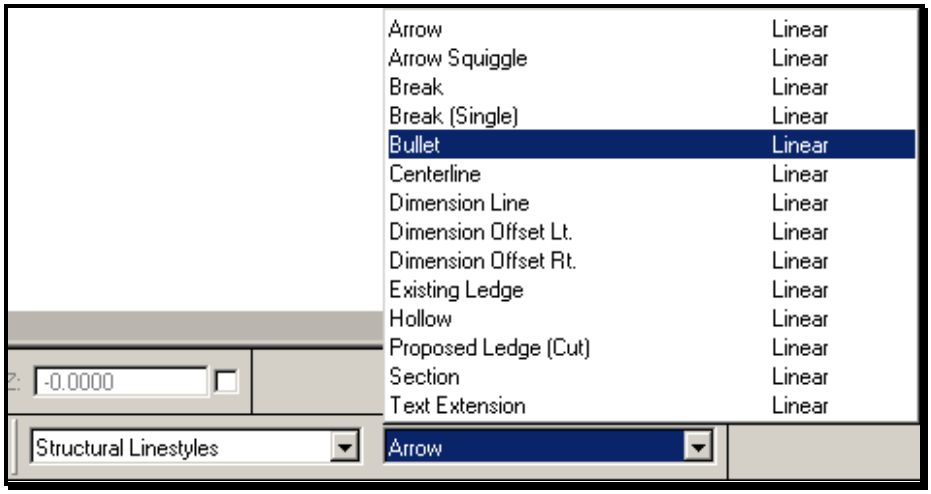


Figure 7-24: Structural Linestyles

This will set your active settings appropriately. It will also issue the *Place Smartline* command. Again, we're going to ignore the command launched by the *Settings Manager* and go on to select *Change Element Attributes*.

This can be selected from the **Main Tool Frame** or from the Main Menu **Qualities > Change > All**. Now identify each line that needs to be changed.

Speeding up the Process

It is possible to use the *Select By Attributes* command from the **Edit** menu (Figure 7-25) to speed up the process of selecting elements that need to be changed.

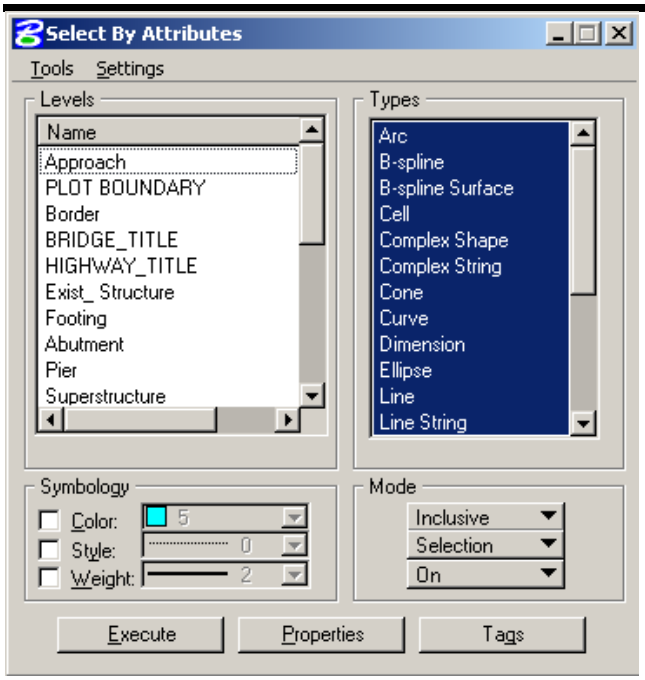


Figure 7-25:Select By Attributes

This utility allows you to select elements by Level, Symbology, and Type (Line, Arc, etc.)

✓ *Refer to page 2-33 for a thorough discussion of Selecting by Attributes.*

TEXT AND THE SETTINGS MANAGER

One of the primary functions of the *Settings Manager* is to help us control text size on details of various scale. We have programmed a number of text settings into the *Settings Manager*. They are accessed through the **Prop. Text and Dims** *Group*.

A Word on Scale

Before you place text on a detail, make sure that you have determined what scale you want that detail plotted at. Make sure you have selected that scale from the *Settings Manager* by choosing **Category > Scale**.

✓ *Check page 2-23 for more information on the Settings Manager Scale.*

Text Components

There are basically four different types of text we'll be placing on our drawing. All of our annotation will be done with the **Text Note** option. This sets up our standard normal text size and activates the text placement command. The other text size options are the **Title Text** options: **Title Text** and **Title Text (Underlined)** and the **Sub-Title Text**.

- It is no longer necessary to underline text by drawing a line underneath it. MicroStation will automatically underline text for you. If you are going to place a detail label, make sure to use the **Underlined** option.

There may be cases where you want larger text that is not underlined, and that is where the **Title Text** *Component* comes in, also you may find an instance where you want a text size that falls between our standard normal size and the title text size. This is when the **Sub-Title Text** option would be handy.

Behind the Scenes: The Long Way Around

What are these *Components* really doing for you? They are setting up text attributes like font, height and width. To see the changes that are made when you select the text *Components*, open up the **Text Dialog** by choosing **Element > Textstyles** from the Main Menu (Figure 7-26).

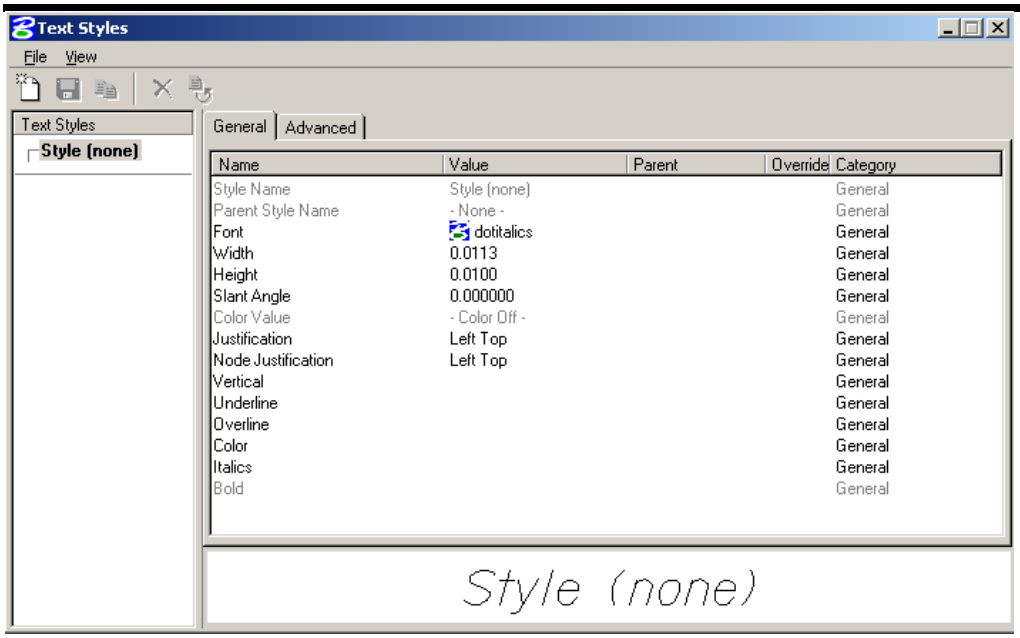


Figure 7-26: The Text Styles Dialog

Placing Text Annotation

Much of the text that we're going to be placing on our drawings is going to be in the form of annotation: a label with an arrow or bullet that extends to a detail. We have decided to approach this matter as simply as possible. First, place your text around your detail. Then, from the **Settings Manager**, select one of the **Text Note** linestyles (like **Text Note Arrow)**.

- Selecting the **Note/Linestyle** component does two things. First off, it sets your active color, style, weight and level -- just like the **Structural Detailing** *Component*. Second, it runs the *Place Smartline* command.

MicroStation is now ready to help you draw a leader line from your text to your detail. Use *AccuDraw* and your snaps to control the geometry of the leader line (Figure 7-27).

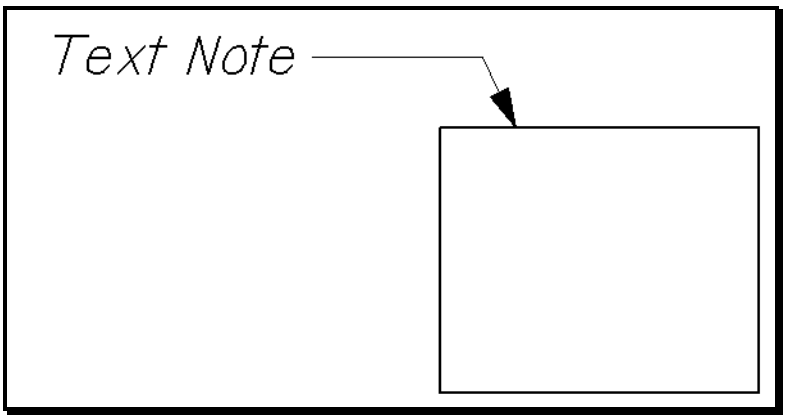


Figure 7-27: Sample Leader Line

Some Difficulties

First off, you can't snap to text in a very useful way for placing notes. The only points you can snap to on text are the origin, the center, and the midpoint. These probably aren't going to help you locate the perfect spot to start placing your leader lines. This means eyeballing is the answer.

Changing Your Mind About Scale

If you change your mind about the scale that a detail is going to be, it's going to screw up your text. There's no way around it.

Chapter 8 Traffic Sheets

ACCIDENT RECORDS WORKFLOW

PIN CREATION

This process is to develop project identifiers for Accident Record Diagrams.

Step One: Opening the Command Prompt Screen

Double click on the Command Prompt Icon on your Desktop (Figure 8-1). If you don't have one, select **Start>Programs>Accessories>Command Prompt.**

Figure 8-1: Command Prompt Icon

Step Two: Changing Directory

You will need to type **Y:** in the Command Prompt window to change your directory (Figure 8-2).

Figure 8-2: Changing directory to Y:\>

Step Three: Creating the Project Identifier

The following steps will need to be done in order to create Project Identifier on the network.

Type: ***Makeaccid 05 0123456789 as*** and press enter (Figure 8-3).

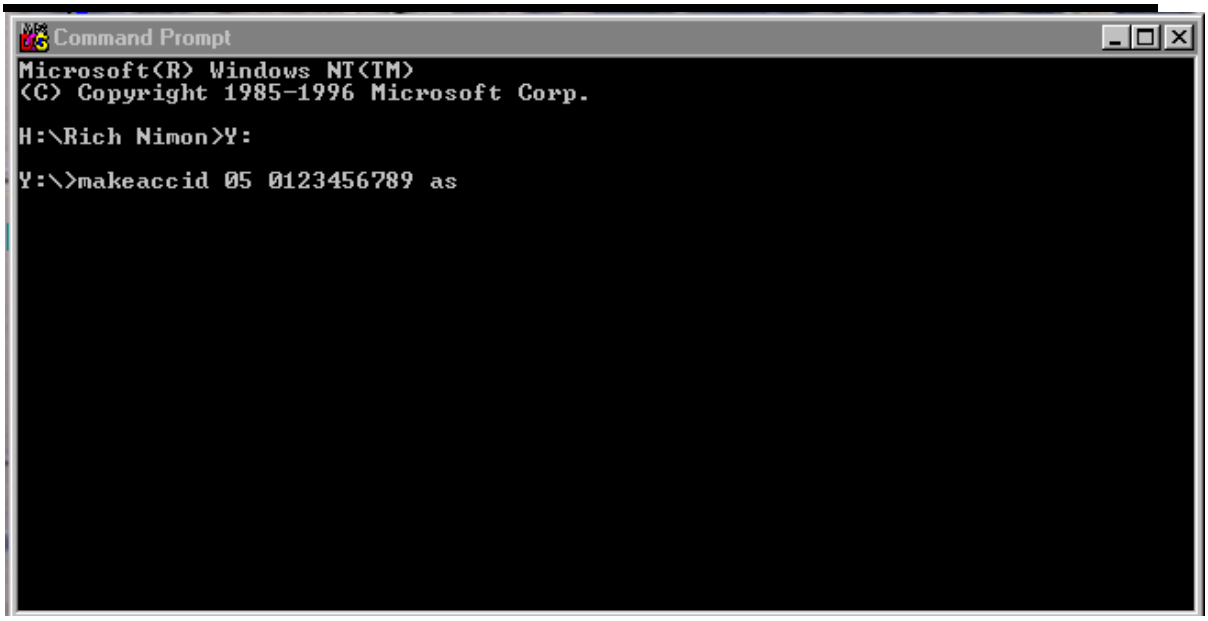


Figure 8-3: Example of an Accid PIN

After pressing enter you will see the following prompt (Figure 8-4), if this is your intention then press enter again.

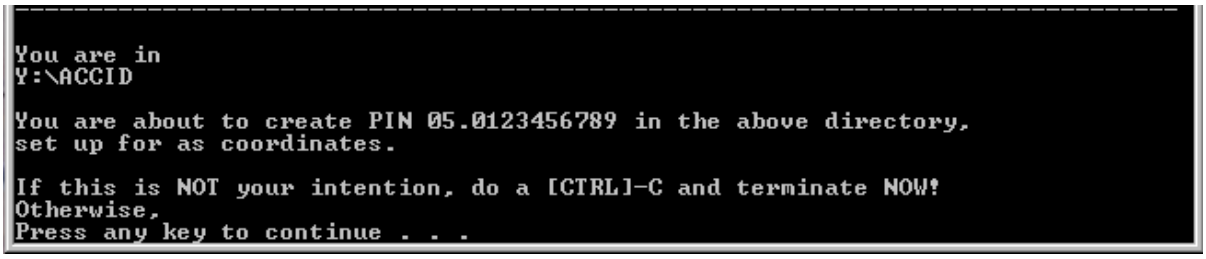


Figure 8-4: Press any key to continue [Ctrl]-C to Cancel

The next prompt below (Figure 8-5) shows you the directory that is being created and verifies that this is correct. If so press enter.

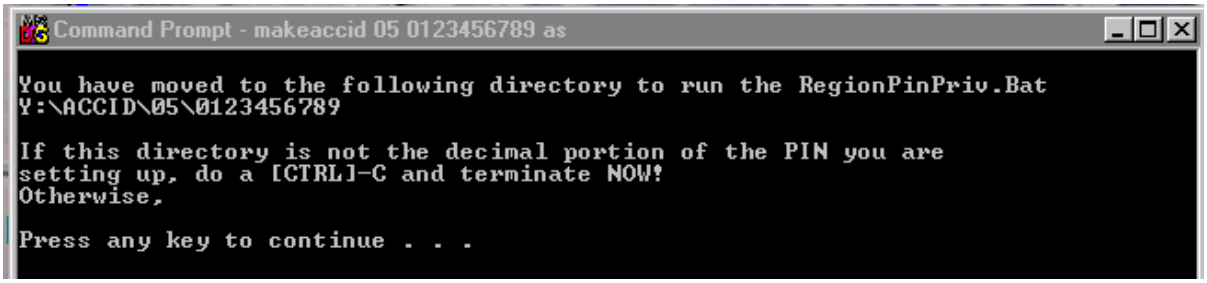


Figure 8-5: Press any key to continue [Ctrl]-C to Cancel

The next prompt just verifies you are sure of your location (Figure 8-6) and if so then enter **Y** in the question statement and press enter.

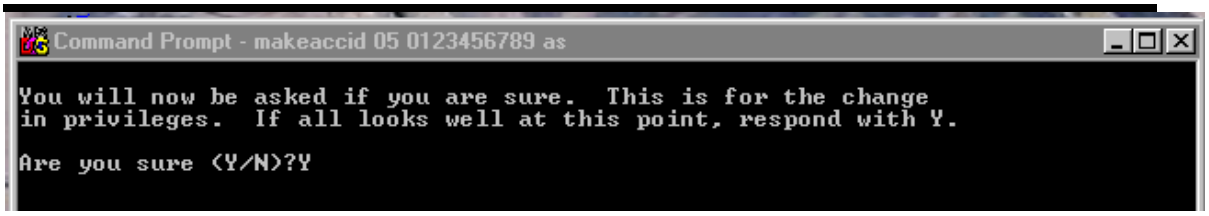


Figure 8-6: Processing the privileges

The next prompt (Figure 8-7) when pressing enter creates a **PCF** file (***Project Configuration File***) for MicroStation.

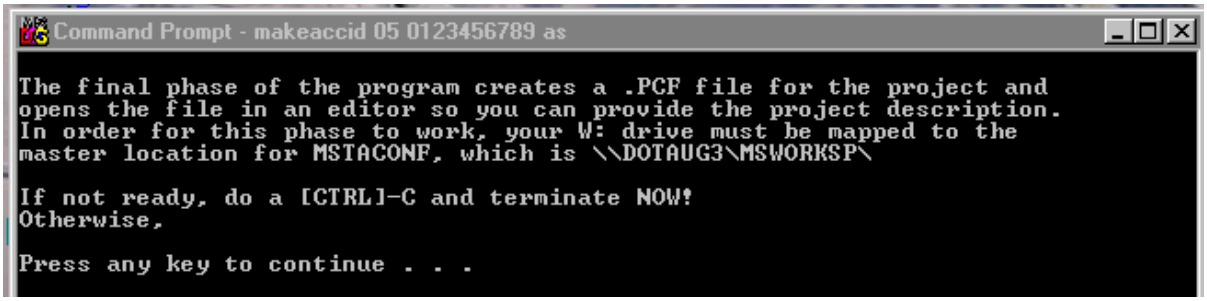


Figure 8-7: PCF File Creation

This next prompt (Figure 8-8) tells you that the file has been created and when you press enter the **PCF** file will open for editing in ***Notepad***.

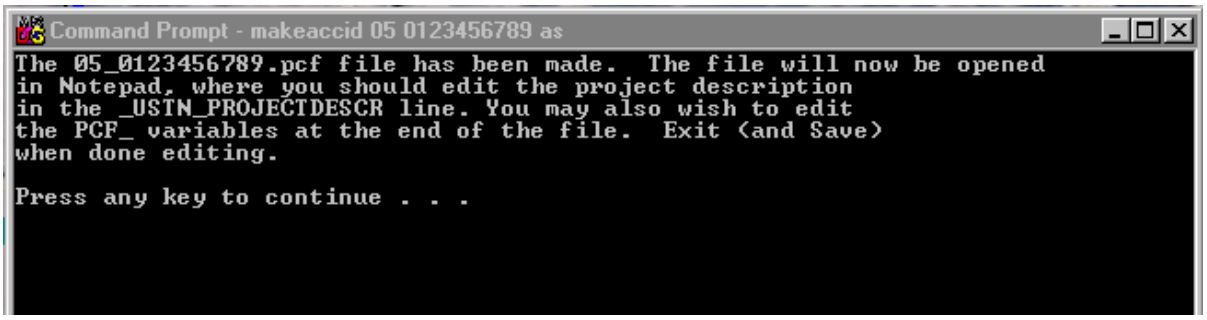


Figure 8-8: Information about PCF file

Step Four: Editing Your Project Configuration File

Below is the **PCF** file for MicroStation (Figure 8-9). The most important thing for you to do in this file would be to fill in the Project Identifier in the line labeled **PCF_PINNUMBER = 05.123456789**. It is important to use a decimal in this number between the **05 and 123456789** for purposes of locating the Project Identifier through your MicroStation Manager dialog. Once edited do a **File>Save and File>Exit**.

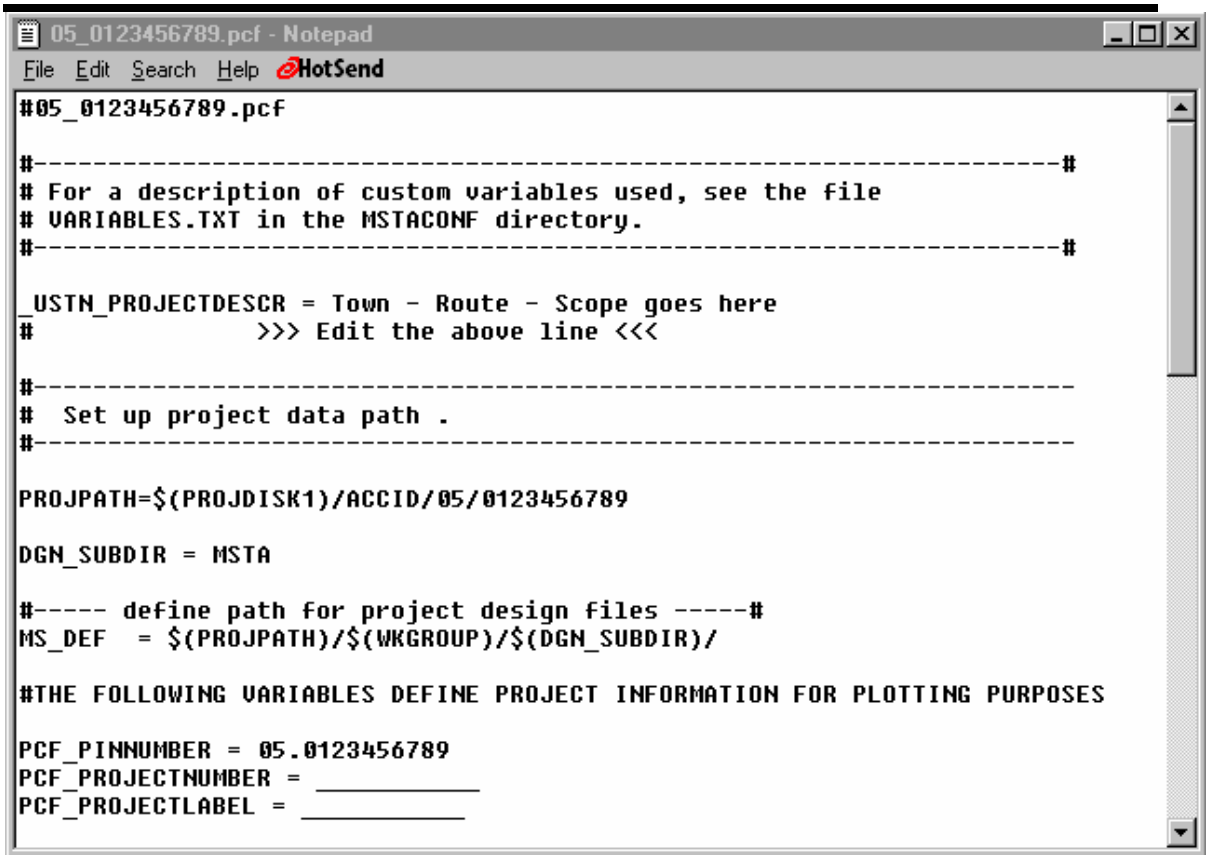


Figure 8-9: Example of PCF file in NOTEPAD

Step Five: Closing Command Prompt Window

You will now need to close out your Command Prompt window by typing **Exit** (Figure 8-10) and pressing enter.

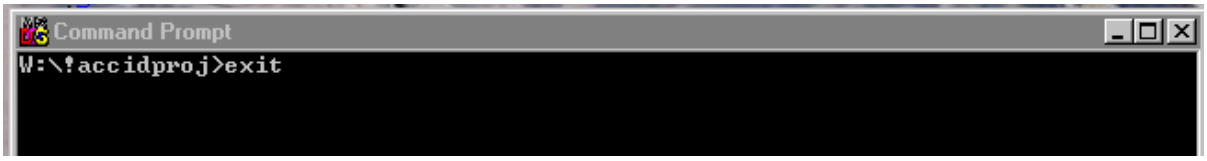


Figure 8-10: Type Exit to Close Command Prompt

Chapter 9 ROW Sheets

OVERVIEW

CONSTRUCT STATION AND OFFSET

The **F12** key runs a customized macro that is going to make it possible for us to construct points at a specific distance along an existing alignment. From these points, we'll be able to draw a line perpendicular to the alignment at a specific distance.

Starting Point

Run the *Pointalong* macro by hitting your **F12** key. You will be prompted to "Identify Point to Construct Distance From." (Figure 9-1)

Figure 9-1: StartPoint Along Status Prompts

The Macro is expecting a data point on your "alignment." Note that you can construct distances along many different kinds of elements: arcs, lines, line strings and complex chains and shapes are all legitimate elements to construct a distance along. This will let you construct distances along baselines, ROW lines, property lines, etc.

You are quite possibly going to be entering this start point based on an intersection of another line with your alignment. For instance, you may want to construct a Plus and Offset starting at the intersection of a tick mark with a baseline.

Entering the Distance and Direction

Once you've entered a data point telling the macro the start point, it will prompt you to "Enter Distance Along Element." (Figure 9-2)

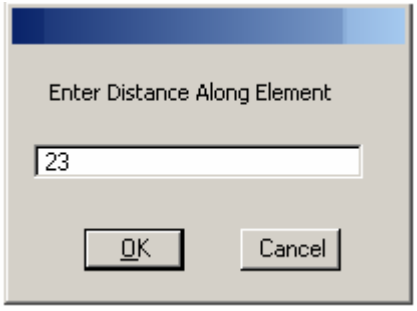


Figure 9-2: Input Distance

If you were trying to construct Station 1+35.240 from a tick mark at Station 1+20.000, the distance to construct would be 15.240. Enter in your desired value and press the **OK** button.

Choosing the Direction

This next step is very important. The macro isn't smart enough to know whether or not you want to construct a point to the left or to the right of the point that you just chose. Look down in your *Status Bar* to see that the macro is now prompting you to "Identify Direction for Construction." (Figure 9-3)

Figure 9-3: Status Bar Message

What it is asking for is a data point either to the left or to the right, or, in the case of a vertical line, above or below the first point you entered. Put your cursor on the baseline near the first point, but clearly to one side or the other (Figure 9-4) and enter in a data point (left button). There is no need to snap to enter this point.

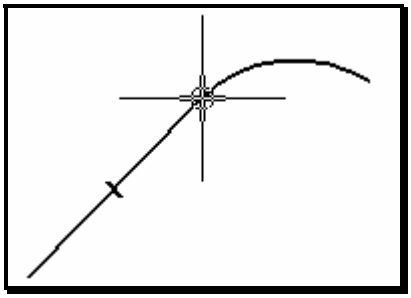


Figure 9-4: Identify Direction for Construction

When you enter a data point, MicroStation will start drawing a line at the specified offset and direction from the first point you entered (Figure 9-5).

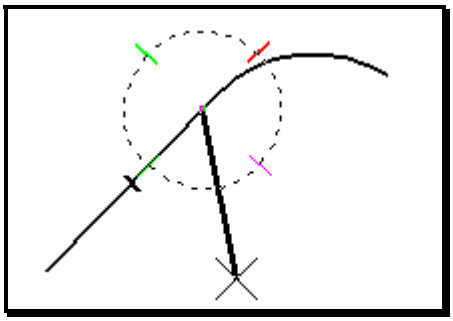


Figure 9-5: Point Constructed

It will also put the **AccuDraw** compass on the line, rotated to make it easy for you to construct a line perpendicular to your baseline.

Choosing the Offset Distance

Now that we are drawing a line, we can choose to go either to the right or to the left of the baseline. Just put your cursor graphically near where you want the line to go. Keep your cursor near the axes of **AccuDraw** and it will ensure that you are drawing perpendicular to the baseline.

Enter your Offset into the **Distance** field of your **AccuDraw** window (Figure 9-6).

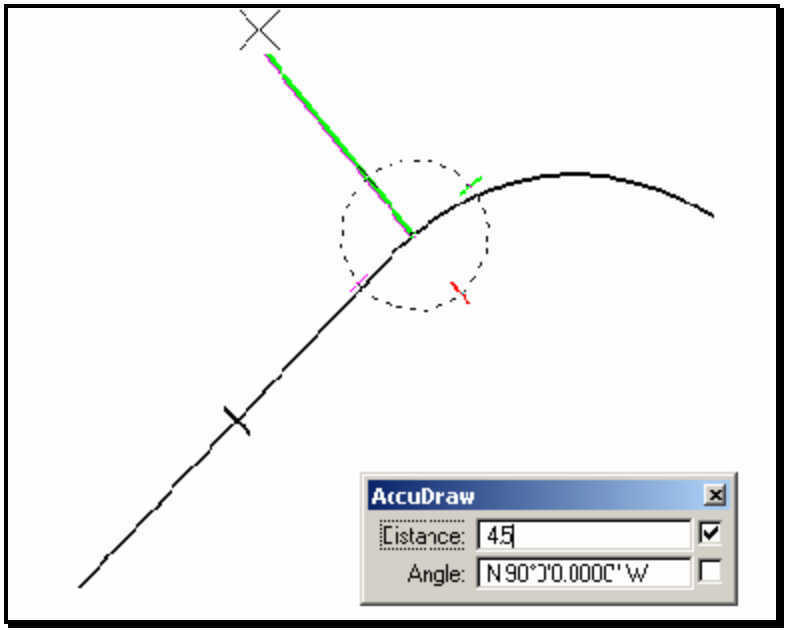


Figure 9-6: Constructing a Distance off the Baseline

Notice that the angle is 90°. Enter a *Data Point* to complete the command. *Reset* to stop drawing lines and press **F12** to start again!

Troubleshooting

There is a **Warning Dialog** (Figure 9-7) that you will get from time to time when you construct distances using this macro.

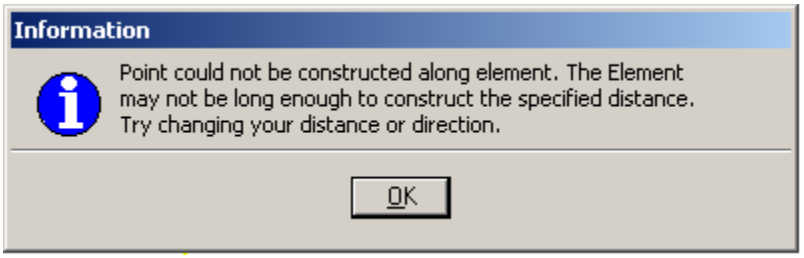


Figure 9-7: Pointalong Warning Dialog

It lets you know that the point you are trying to construct cannot be constructed because your Element is too short. This could happen for a couple of reasons.

1) You may have just chosen the wrong direction to construct from. Your baseline may run 16 kilometers to the right and only 16 centimeters to the left of your offset point. You can't construct a point 10 meters to the left of that first point.

2) You may have picked the wrong element to construct the distance along. Choose the point again and make sure that you *Accept* only the element you want to construct along.

3) You may have used the *Drop Element* tool to drop *Complex Status* of the baseline. This would have broken up the lines and arcs that are joined together in a "complex chain" of a baseline, leaving only individual lines and arcs. The resulting elements are much shorter than a typical baseline.

You can put dropped baselines back together using the *Create Complex Chain* tool. Set your method in the *Tool Settings Window* to **Automatic.**

✓ *Refer to 2-12 for using the Complex Chain Tool*

4) You may be confusing Metric and English units. Make sure you're not trying to go 75 feet along a 40-meter line. MicroStation reads that "75" distance as 75 meters if you're working in a metric drawing.

PROCEDURES

CREATING ROW PLAN SHEETS

Step One: Open RWPLAN-clips.dgn

Select your project from the list of projects in the **Project** pulldown at the bottom of the *MicroStation Manager*.

Select **RWPLAN-clips.dgn** from the list of files on the left and press **OK**. If the **RWPLAN-clip.dgn** does not exist the file will have to be created. Open the **RWplan.dgn**.

Select: > **File > Make Sheetz >** click on **no prefix** (Figure 9-8) and click **OK.**

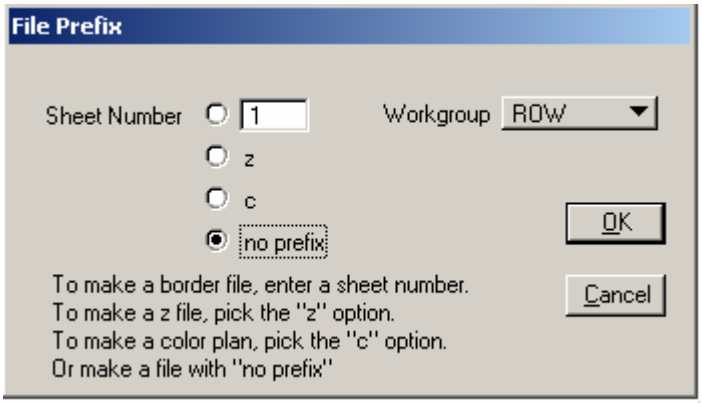


Figure 9-8: File Prefix Dialog

Choose **RWplan-Clips** (Figure 9-9) and click **OK** in the **Create File Of Type…** Dialog.

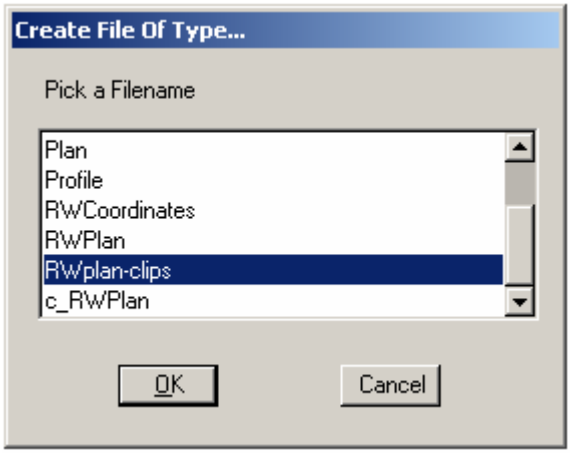


Figure 9-9: Create File Of Type Dialog

Click **OK** in the **Make File** Dialog (Figure 9-10).

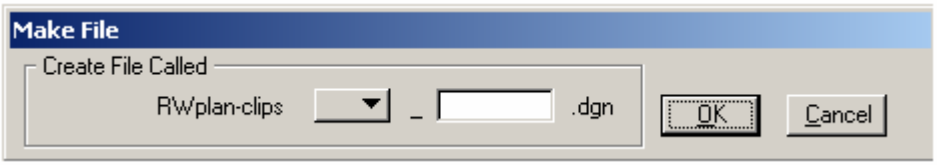
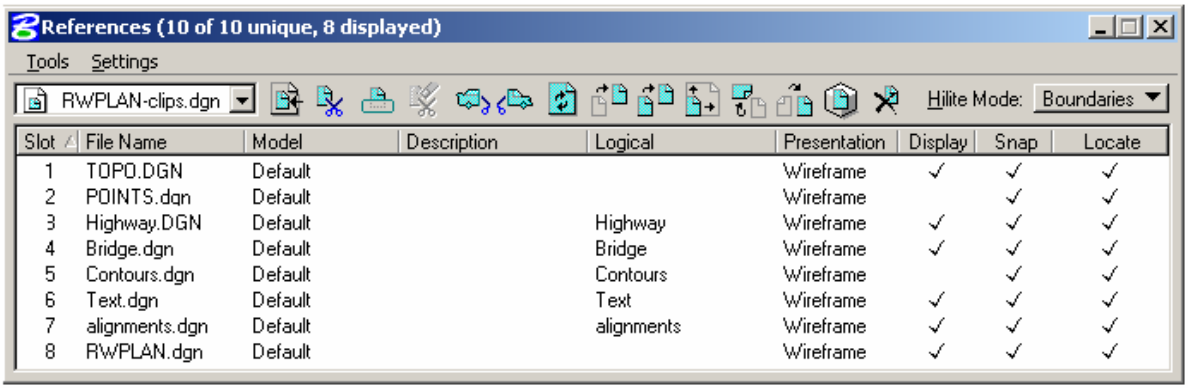


Figure 9-10: Make File Dialog

Click **Cancel** in the **File Prefix Dialog** to exit the **Make Sheetz** program.

In the **RWplan-clips.dgn** look in the **Reference Dialog** (Figure 9-11) to confirm the attached Reference Files.

Select: **Files > Reference(DOT) > Dialog**



Slot	File Name	Model	Description	Logical	Presentation	Display	Snap	Locate
1	TOPO.DGN	Default			Wireframe	✓	✓	✓
2	POINTS.dgn	Default			Wireframe		✓	✓
3	Highway.DGN	Default		Highway	Wireframe	✓	✓	✓
4	Bridge.dgn	Default		Bridge	Wireframe	✓	✓	✓
5	Contours.dgn	Default		Contours	Wireframe		✓	✓
6	Text.dgn	Default		Text	Wireframe	✓	✓	✓
7	alignments.dgn	Default		alignments	Wireframe	✓	✓	✓
8	RWPLAN.dgn	Default			Wireframe	✓	✓	✓

Figure 9-11: Reference File Dialog

- This dialog already shows that you have topo, text, bridge, highway, etc. files attached. If these files are not attached or other files are needed, refer to page 2-70 for Reference Attach Methods.

Step Two: Cut Sheets

Introduction

At this stage we are going to be placing rectangles along the alignment that will correspond to our sheets. We will be using the *Settings Manager* to accomplish this. The *Settings Manager* is docked at the bottom or top of your screen. If the *Settings Manager* is not displayed, it can be launched from the menus by **Settings >DOTSetMgrs > Right-of-Way**. Based on the file name, the correct *Settings Manager* should be automatically loaded.

Part One: Set Category Scale

Right Click anywhere on the *Settings Manager* and select **Category>Scale.** Select the intended plot scale for the plan sheets (i.e. 1 in. = 25 ft. or 1 in. = 50 ft. (1:250 or 1:500 for metric projects)).

- You should be the same scale that other programs are using for the project. When Survey Editors create the topo and text for the projects, this governs the scale.

Part Two: Place Clip Boundaries

From the *Settings Manager* select **Borders >Clip Boundary**. This selects our sheet boundary cell and activates a cell placement command that will make it easy to place a bunch of these rectangles along the alignment.

Notice the box on the end of your cursor. When you send a Datapoint to MicroStation, the box will be placed at that location. (You might want to set your snap mode to *Nearest* and snap to the centerline of road.) The box you just placed will immediately begin to rotate by the origin point (the point you just entered.) Move your mouse around and notice how

it spins. When it is aligned with the roadway, enter another Datapoint (again, you might want to *Nearest* snap to the centerline) and it will immediately prompt you to place the next boundary.

Don't worry if they're not in exactly the right place -- you can go back and clean up any mess later by using the move and rotate tools. It is important, however, that you place these boundaries in the order that you want your sheets to be numbered. We have a routine that automatically creates plot drawing files for us, and it will number them in the same order that you place these clip boundaries.

Step Three: Make new Plan Files

From the *Settings Manager* select **Tools > Plan File Maker**. This macro is doing a number of things. First off, it is creating saved views in RWPlan-clip.dgn that are aligned with the clip boundaries we just placed. It asks you what number you want to use for the starting number of the ROW plan sheets. If you know where the sheets will fall in your plan set, enter this number here. The default will be "1". If you don't know yet where they will fall, use the default and we will utilize the **Sheet Renumbering** routine to organize the files outside of MicroStation.

When you have finished, the program will drop you back into rwplan-clips.dgn. Open up the files you've just created and see how they look!

✓ *Refer to page 1-22 about the Sheet Renumbering Utility.*

✓ *Refer to page 1-25 about PCF editing.*

✓ *Refer to page 1-27 about the Border information macro.*

✓ *Refer to page 1-30 about disabling the Borderinfo Substitution.*

Troubleshooting

This macro has very specific expectations, and anything different about your input has the potential of giving you bad output.

It can only sheet up files in the order that the clip boundaries were placed in the file. If you need to add sheets at the beginning of the project, it might be easier to delete all your clip boundary cells that you placed and start again from scratch.

CREATING ROW INFORMATION PLAN

Overview

As a new requirement Right-of-Way Mappers will be required to generate a **001_RWCoordinates.dgn** file which contains control information for a project. This will require communication with the ***Project Designer/Technician*** to receive the necessary file to read into the dgn.

Step One: Creating 001_RWCoordinates.dgn

From the main menu select **File>Makesheetz**. Leave the dialog toggled to **Sheet Number** and select **OK** (Figure 9-12).

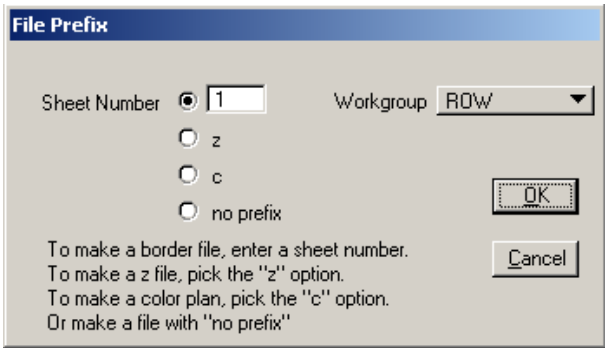


Figure 9-12: File Prefix Dialog

Choose **RWCoordinates** (Figure 9-13) and click **OK** in the **Create File of Type…** Dialog.

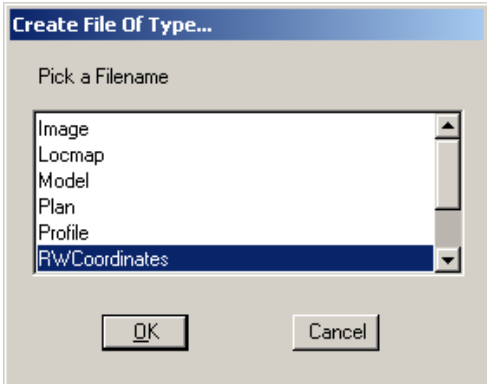


Figure 9-13: Create File of Type… Dialog

Click **OK** in the **Make File** Dialog (Figure 9-14).

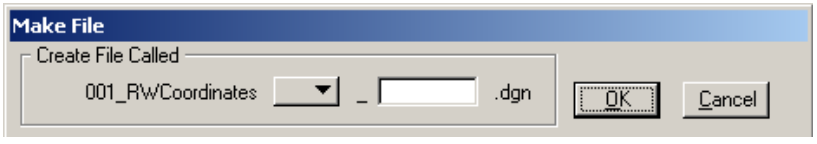


Figure 9-14: Make File Dialog

Now that the file is created select **Cancel** to end the process of creating files.

Step Two: Placing Coordinate Information

In the Right-of-Way *Settings Manager* select **Tools>Create ROW Coordinate Info.** (Figure 9-15).

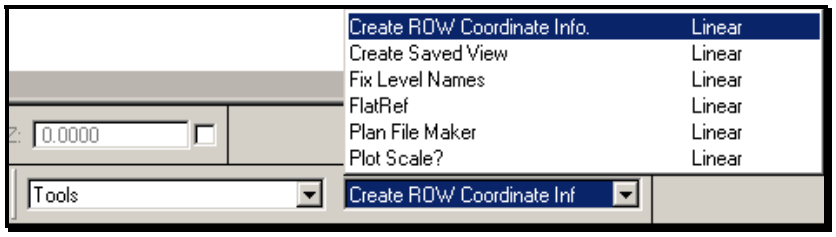


Figure 9-15: Right-of-Way Settings Manager

The information will be developed on the sheet drawing automatically if the file is found. The program also looks for any overrun of information and will create, if necessary, a second drawing to finish the process.

- This program was created to look for a **RWInformation.txt** file created in the **Mx/Reports** folder of the specific work group. (Ie. Bridge or Highway) If the program can not locate the file you will receive a message stating you need to talk to the Project Designer. They are required to run a program within **Mx** called **MaineDOT Right of Way Sheet** to generate this file.

✓ *Refer to page 1-22 about the Sheet Renumbering Utility.*
✓ *Refer to page 1-25 about PCF editing.*
✓ *Refer to page 1-27 about the Border information macro.*
✓ *Refer to page 1-30 about disabling the Borderinfo Substitution.*
✓ *Refer to page 4-4 about creating your Location Map.*

CONSTRUCT A METES AND BOUNDS DESCRIPTION

You will use this routine to construct county layouts and surveys. When you need to construct a Metes and Bounds, there are only a couple of things you're going to need to bear in mind.

Tools

You're going to be using *Smartline* and *AccuDraw*. Make sure that you are in **Bearing** mode by hitting your **F9** function key.

Setup

First off, make sure you're in a *Top View*.

Choose **Rotate View** icon from the tools at the bottom of your View 1 - Top Window (Figure 9-16).

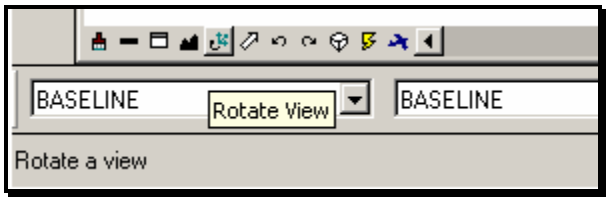


Figure 9-16: Rotate View Dialog

Look at your **Tool Settings Dialog** and make sure you have *Top* selected as your rotation **Method** (Figure 9-17).

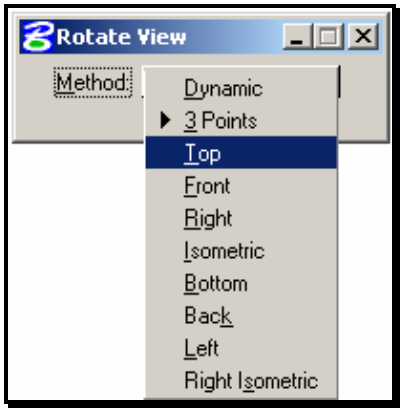


Figure 9-17: View Rotation Top Dialog

Enter a *Data Point* to begin your line, then type your bearing and distance into the **AccuDraw Dialog**. Make sure you are in **Distance/Angle** mode. Hit your **Spacebar** if you aren't (Figure 9-18).

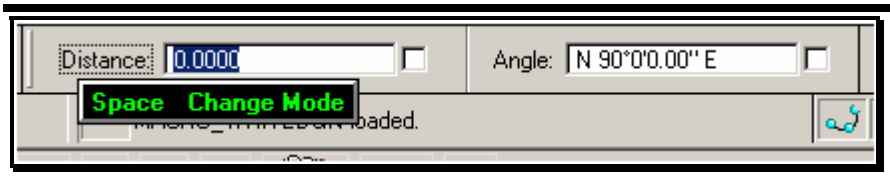


Figure 9-18: Toggle AccuDraw Mode Dialog

Placing Lines

As you go, your **AccuDraw Compass** is going to rotate to align with line that is being placed.

- You have to make sure that it is always rotated back to horizontal between every segment: type **V** with active **AccuDraw** to rotate the **Compass** to the view (Figure 9-19).

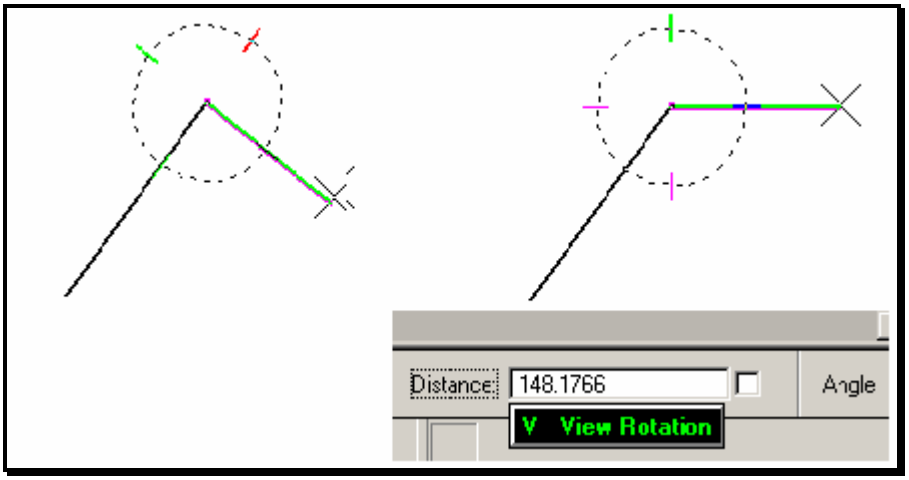


Figure 9-19: Rotate AccuDraw to the View

For More Information

✓ *Check page 9-17 for more information on working with Baselines.*

Offset Using Copy Parallel

Once your line is constructed, you're going to want to offset the line by some distance. Use the **Move Parallel** tool from the **Manipulate** toolbox (Figure 9-20).

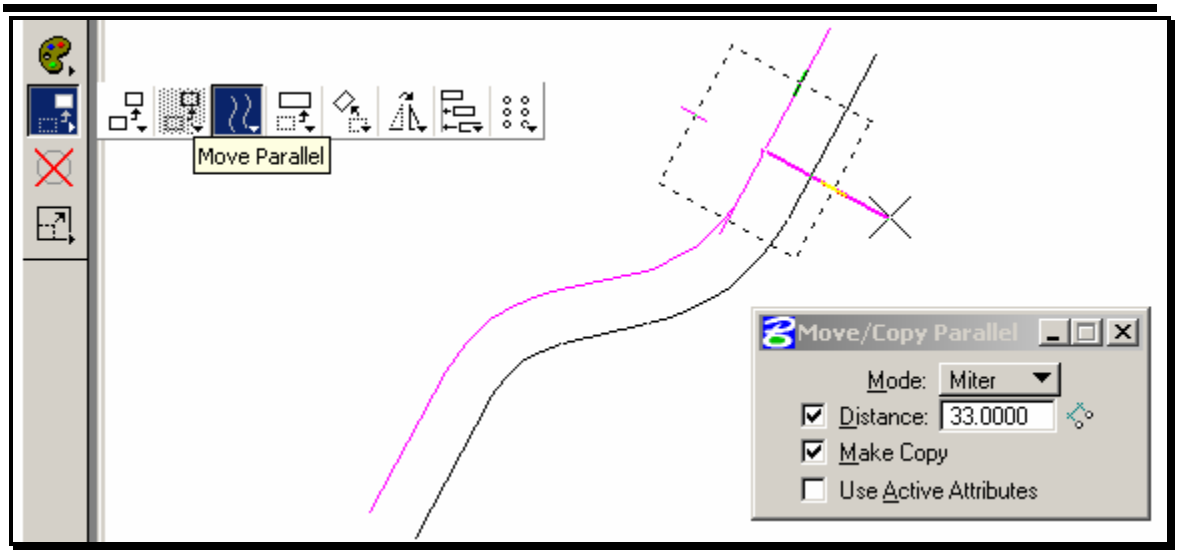


Figure 9-20: Move/Copy Parallel Dialog

In your **Tool Settings Window**, make sure that **Distance** and **Make Copy** are turned on. Type the offset distance into the **Distance** field and identify the element you want to copy by *Data Pointing* on it. Move your mouse and watch the line pop back and forth to either side of your original line. Once it is displaying on the proper side, *Data Point* again to accept the final location. *Reset* to complete.

Fitting the Layout

Once the layout has been constructed, you're going to need to rotate and move it into place over the survey information. There are only a couple steps to this process.

First, use the *Element Selection* tool or *PowerSelector* to pick all the elements in your layout (Figure 9-21).

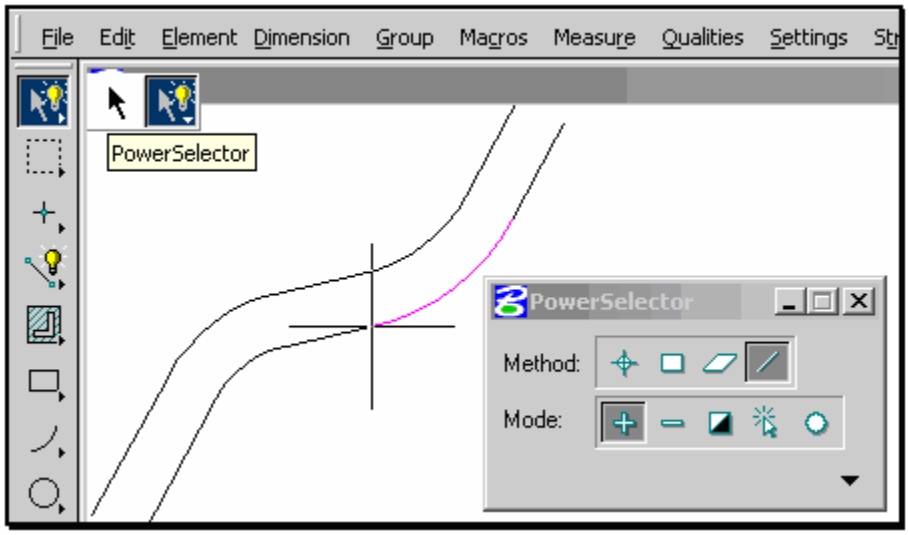


Figure 9-21: Pick the Elements in your Layout

Snap (but do not *Accept*) to your layout at the point you want to pick it up from.

Second, choose **Edit > Cut** (**Ctrl+X**) from your **Main Menu**.

Now, choose **Edit > Paste** (**Ctrl+V**) from your **Main Menu**. You should see your layout hovering over your drawing, hanging off your cursor from the point you gave it in step one (Figure 9-22).

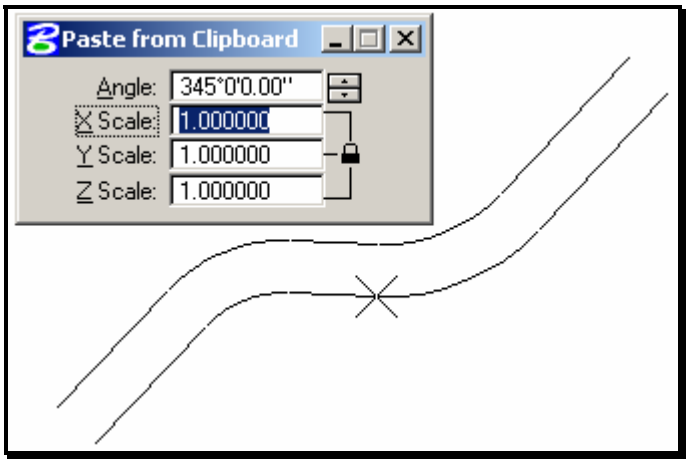


Figure 9-22: Paste your Layout Down

Look at your **Tool Settings Window** and be sure that your **Scales** are all set to 1 (otherwise, your layout will be made bigger or smaller.) Change the **Angle** field and move your layout around your drawing until you get a good fit. **Data Point** to place the layout in your drawing.

Fine Tuning

If you want to make changes to individual components of your layout after you've got it into place, use the **Modify** command from the **Manipulate** toolbox (Figure 9-23).

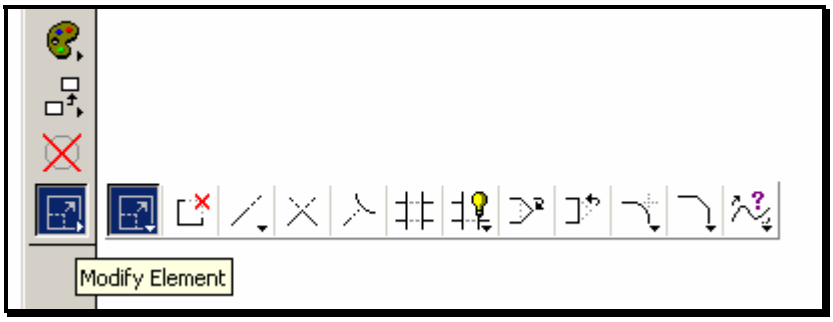


Figure 9-23: The Modify Command

With this command you can flatten or sharpen angles and shorten or lengthen lines. It basically will allow you to move any vertex to any other point. *AccuDraw* sometimes interferes with these kinds of “eyeball” commands -- press your **F7** key until you see your **AccuDraw Window** disappear. When you’re done, press **F7** and it will come back again.

It’s going to be tough to use *Modify* to make your second line be parallel to a *Modified* line. Use *Delete* to get rid of your second line entirely, and then use *Copy Parallel* to create another parallel copy of your *Modified* line.

BASELINE OVERVIEW

As with most things in MicroStation, there is more than one possible approach to constructing a baseline. What we are presenting here is the method that is going to minimize the amount of hand calculating required.

Baseline Geometry:

First we're going to construct the baseline using *Smartline* and *AccuDraw*. We're only going to need a few pieces of information to complete a Baseline. For starters, we're going to need a Bearing and Distance of a tangent. After that, all we need is the Radius and Delta Angle for each curve and a distance for further tangents.

Checking and Cleaning Up Geometry:

After we have constructed a Baseline, we're going to drop it into its components to make sure we've drawn it correctly. If we've made any mistakes, we'll correct them with the *Modify* and *Rotate* tools. Then we'll group the Baseline back together as a *Complex Chain*.

Stationing and Annotating:

Next we'll place PC and PT lines. We'll label them from the *Settings Manager*.

✓ *Check page 2-20 for an overview of the Settings Manager.*

From those we'll find a beginning station and we'll put station marks along the length of the baseline. Then we'll edit the text of our Station Marks and place Curve Data.

BASELINE TOOLS

There are a number of tools that we're going to be using to construct our Baseline. Some of them have some very specific capabilities that we should review and clarify before you get started working with them.

Smartline

We're going to be relying on *Smartline* to create our baselines. *Smartline* is capable of creating a series of lines and arcs (Figure 9-24). We are going to be constructing lines based on *Distance* and *Bearing* and constructing arcs based on *Radius* and *Delta*. With a little help from *AccuDraw*, it's going to be simple to build "on the fly" lines that are tangent to arcs as well as arcs that are tangent to other arcs.

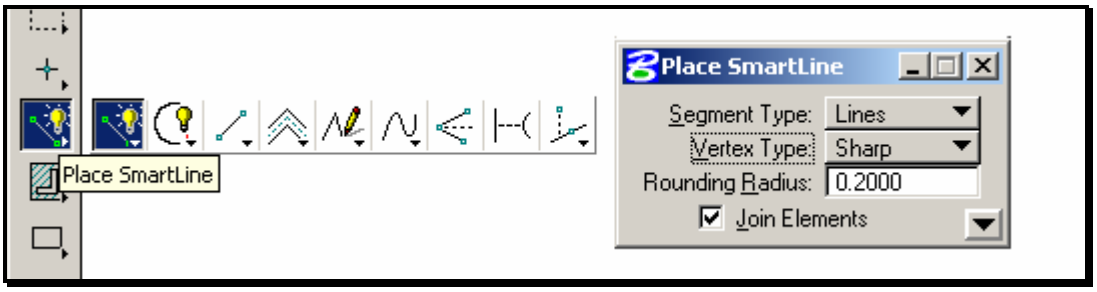


Figure 9-24: Smartline Segment Type Options

As we work we are going to be toggling *Smartline's Segment Type* back and forth from **Lines** to **Arcs**. We are not going to be making any changes to *Smartline's* **Vertex Type**. We are going to make sure it's set to **Sharp** and leave it at that.

Something that isn't going to be obvious at first about drawing with *Smartline* is that you should try to do all of your construction without hitting your *Reset* key (right mouse button.) With **Join Elements** selected in your *Smartline Tool Settings Window*, constructing your entire baseline without hitting *Reset* means that the resulting series of lines and arcs is going to be joined together as one element (a *Complex Chain*). Another benefit of constructing the *Smartline* as one element is that *AccuDraw* is going to be more helpful. It's going to do this by keeping constant tabs on our latest distance and direction of construction.

A Word About AccuDraw

AccuDraw is a critical part of this process. There are a couple of things to keep in mind when you're using *AccuDraw*.

First off, when you type angles into *Accudraw's* **Angle** field, you have to make sure you're typing in the right **Angle Mode**. Since we're going to be entering angles in both **Bearing** (N 23° W) and **Conventional** (113°) we need to be able to toggle back and forth between these two **Angle Modes** quickly.

We've set up *Function Keys* to accomplish this. **F8** will set the Angle Mode to *Conventional*; **F9** will set the Angle Mode to *Bearing*. When you are typing in Angles in *Bearing* mode, make sure to start your angle with either an **N** or an "S" and end your angle with either an "E" or a "W." In both *Bearing* and *Conventional* mode, you need to separate Degrees, Minutes, and Seconds with an appropriate symbol. MicroStation uses the ^

character to represent degrees (**Shift+6**). MicroStation uses the ‘ character for minutes and the “ character for seconds.

- Make sure that when you type a distance or an angle into *AccuDraw* that you do not use the **Enter** key to “submit” your values to *AccuDraw*. **Enter** has a very specific function to *AccuDraw*. It is the *Smartlock* function. What this does is to lock the **Angle** of whatever you’re constructing to be either horizontal or vertical (relative to the **AccuDraw Compass**.) We will be using the **Enter** key for **Smartlock**, but not for entering numbers in the window.

Also, keep your eye on your **AccuDraw Window** when you’re entering in distances and angles to keep from typing angles into the distance field and vice versa. It takes a good long time to type an angle in bearing format right down to the nearest tenth of a second. It’s a shame to have to type it all over again because you entered it into the distance field instead of the angle field. The easiest way to get into the distance field from the angle field is by using your **Tab** key (just to the left of the letter Q).

AccuDraw Shortcuts

AccuDraw Shortcuts are single (or occasionally double) key strokes that you type while **AccuDraw** is active. A common example of a shortcut is the **Spacebar**. When *AccuDraw* is active and you hit the **Spacebar**, *AccuDraw* shifts back and forth between **Distance/Angle** and **XYZ** mode.

Another shortcut that we’re going to get a lot of mileage out of is the **tilde** key (~). This is the key that’s just to the left of the number 1 at the top of your keyboard. This shortcut is called *Bump Tool Setting*, and we’re going to use it when we swap back and forth between drawing arcs and lines as we’re using the *Smartline* tool. It’s worth noting that you don’t have to hold down the **Shift** key to get this shortcut to work -- even though the “~” character is usually typed by holding down the **Shift** key.

Conclusions

These tools are going to be able to do just exactly what we need them to do to help us minimize the amount of hand calculations required to lay out a Baseline. However: they’re finicky. You’re going to have to keep a constant eye out on your **AccuDraw** window and your **Tool Settings Window** to make sure that your options are set correctly as you go.

BASELINE GEOMETRY

Step One: Bearing and Distance

From the *Settings Manager* select **Baseline > Baseline** (Figure 9-25).

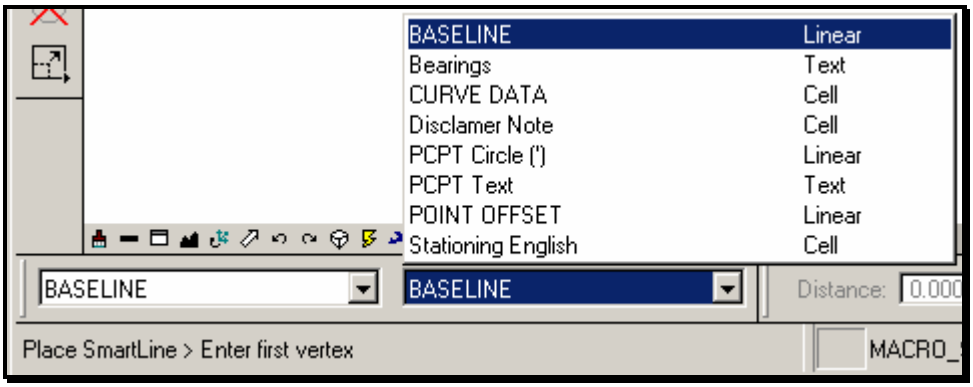


Figure 9-25: ROW Settings Manager

This will put you in the correct level, color, style and weight for drawing Baselines, as well as activating the *Place Smartline* command.

It's a good idea to start every baseline with a Bearing and Distance if at all possible. Start by entering a Data Point to begin your line. Take a look at your **AccuDraw Window** and make sure that you are in *Bearing* mode (look for an **N** or an **S** in the angle field.) If you're not, press **F9**. This will run a MACRO that sets your active **Angle Mode** to **Bearing**. Then enter your **Bearing** and **Distance** into your **AccuDraw Window**.

Note that you can still draw the line either to the left or the right of the origin point, as illustrated in Figure 9-26 and Figure 9-27. Make sure that your line on the screen visually agrees with the baseline you intend to draw by moving your cursor either to the left, right, up, or down to get the direction correct.

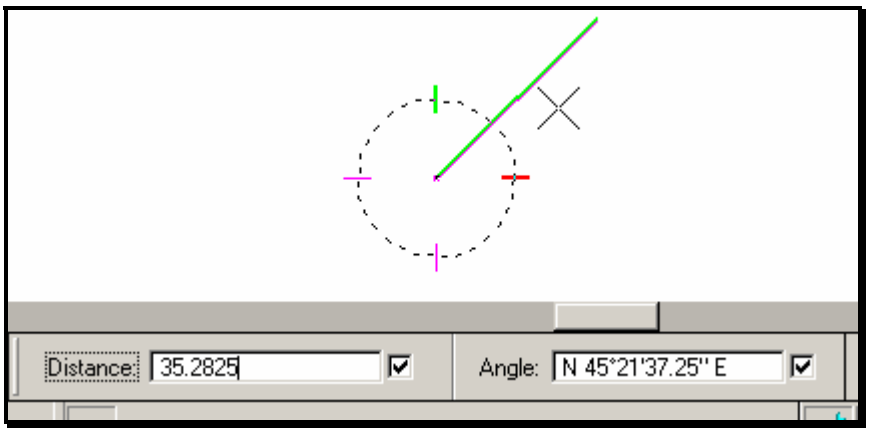


Figure 9-26: Drawing to the Right at a Fixed Angle

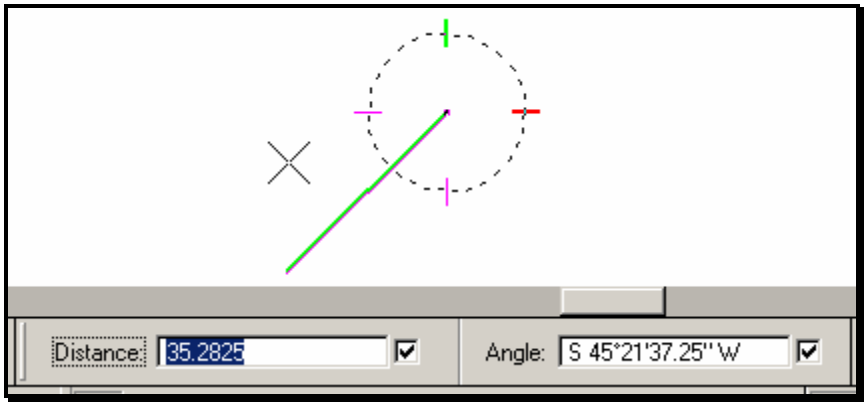


Figure 9-27: Drawing to the Left at the Same Angle

ⓘ ***Don't enter a Data Point until you're satisfied that you're drawing in the right direction.***

Step Two: Troubleshoot and Prepare to Draw a Curve

You have now successfully entered the first segment of your Baseline. Do not hit your *Reset* button (right mouse button.) MicroStation should now be in the middle of drawing a *Smartline* (Figure 9-28) Your **Status Bar** (bottom of your screen) should be prompting you to "Enter next vertex or Reset to complete."

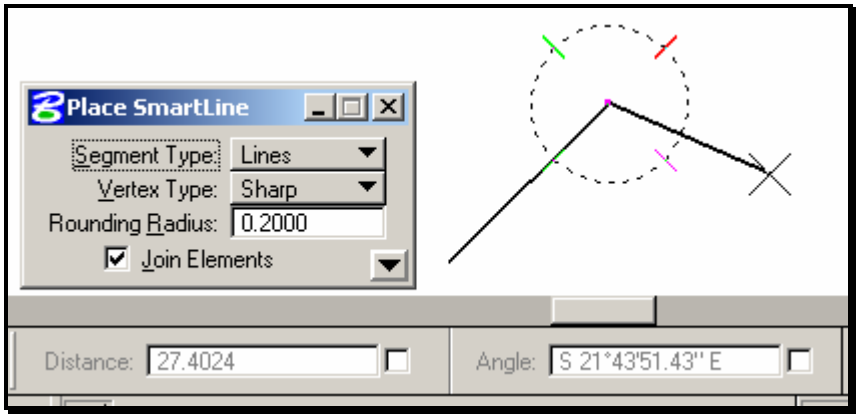


Figure 9-28: First Line Complete

Even if you have screwed up this first portion, do not hit your *Reset* button -- go to your *Main Menu* and select **Edit > Undo Last Data Point**. This is important to keep in mind now and for the rest of this creation process: if you make a mistake, **UNDO**. Do not *Reset*. You can also **Undo** by typing **Ctrl+Z**.

If you do (accidentally) hit your *Reset* at this stage, it's not the end of the world. All you have to do is start drawing again. Snap to the end point of the baseline you just constructed and *Accept*. This will put your **AccuDraw Compass** at the correct point but it will probably not be rotated.

Tentative Point. Instead, type "RQ." This will activate **Accudraw's** *Rotate Quick Shortcut* and spin the **Compass** to the proper rotation.

- Use the **Tilde** key (~) to toggle *Smartline* from **Segment Type Lines** to **Segment Type Arcs** (Figure 9-29).

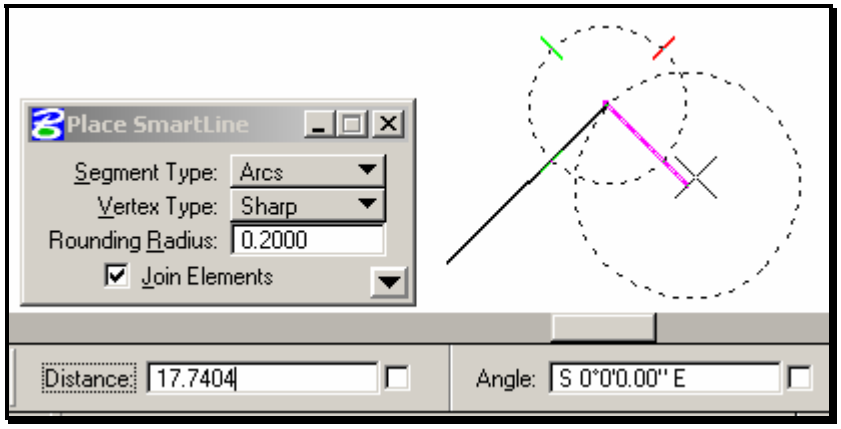


Figure 9-29: Swap to Smartline Arcs

Now type **F8** to change your angle mode back to *Conventional* from *Bearing*. This is going to help us enter in curve deltas (as arc sweep angles.)

Step Three: Draw a Curve

Move your mouse around a bit to notice a couple of specific features here. First off, you're going to see a dotted circle moving around the screen. Notice that your cursor is at the center of this circle.

Notice also that the **AccuDraw Compass** is at the edge of this circle at the point where the circle intersects the line you just drew. Move your mouse around until the dotted circle looks like it's perpendicular to the line you just drew. Notice that as you get close to this point, **AccuDraw** is going to tend to "snap" you in along one of its axes. This is going to help us lock in our curve to be tangent to our baseline.

Moving your mouse around, line up the dotted circle so that it is curving in the right direction. Also make sure it is at least visually perpendicular to the baseline, then hit **Enter**. This is **Accudraw's Smartlock**, and it will nail down the location of the center of the curve. Now you're ready to enter in the Radius of the curve.

ⓘ ***Make sure that you are typing in Accudraw's* Distance *field (if there is a cursor blinking in the* Angle *field, hit your* Tab *key to put it in the* Distance *field.), then type the radius of the curve.***

What you are entering at this point is the center point of the curve. As you know, the center of the curve can be a long way away from the baseline. What this means to us in MicroStation is that the point you are about to enter may be way out of your *Window*. This is not a problem. Enter in a Data Point to accept the point you've just constrained, and let's see where we are.

What you're going to see is probably going to be something like the picture in Figure 9-30. As you move your mouse around you'll notice you're constructing an arc. You'll notice a couple of dotted lines that are radial to the arc, one of them at the tangent point to the baseline, one of them near your cursor.

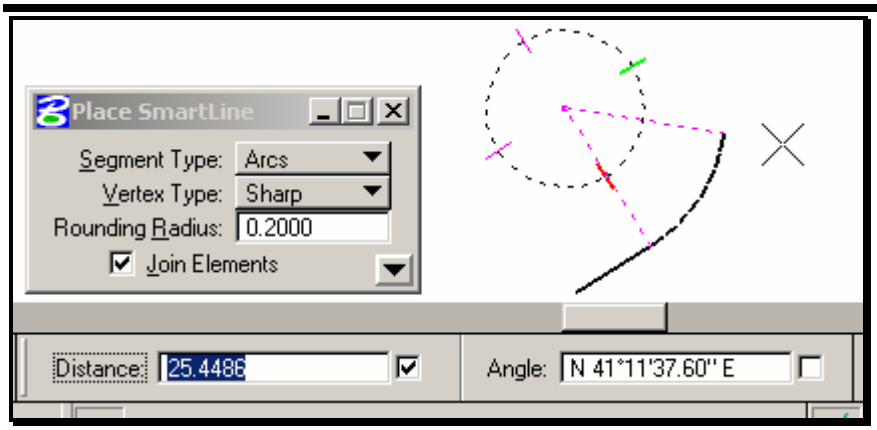


Figure 9-30: Sweep an Arc

What you need to do here is make sure that you are drawing this curve in the right direction. You may have to use the **Zoom Out** command to get the center of your arc in your view. Type **F3** and *Data Point* in your window.

Zoom Out. You may need to click a few times to **Zoom Out** a number of times. *Reset* (just once) and MicroStation will drop you out of your **Zoom** command and back into the **Place Smartline** command and it will show you a more complete picture of the curve you are constructing.

Once you can see the **AccuDraw Compass** at the center of the arc, move your mouse around a bit. Notice that the arc sweeps around with the mouse. To change the direction of the arc, sweep your cursor around the **Compass** point until you see the arc begin to look a little bit more like you want it to. Now you're ready to enter in the Delta of the curve.

Make sure you are typing in **Accudraw's** *Angle* field. Again, if you are in the *Distance* field, just type *Tab* to get to the *Angle* field. Now type the Delta value for the curve into the field. Enter a **Data Point** when you are done.

Step Four: Troubleshoot and Prepare for Another Curve or Tangent

You have now successfully placed a Curve on to your Baseline.

- If you made a mistake in this portion of construction, remember NOT TO HIT YOUR **RESET** (Right mouse button.) All you need to do is **Undo** (**Ctrl+Z**) to gracefully step back in the command and pick up your construction from the last correct point. You can **Undo** more than once, if need be, but take it slow and be sure not to **Undo** too far.

If you did (Accidentally) hit your *Reset* key, you can start up again like you did in **Step 2** with one notable exception. You're going to snap to the end of your baseline and Accept to start placing your *Smartline* again. Then you need to get the **AccuDraw Compass** rotated correctly again. Instead of snapping to the center of the last tangent, you're going to want to snap to the center of the last curve that you placed (use the *Center Snap* by typing **C** into *AccuDraw*). Note that this center point is usually far away from the baseline. Once you've snapped, type **RQ** to rotate *Accudraw's* compass.

At this stage of the game you're totally set up to repeat **Step 3** and construct another curve. Your *AccuDraw Compass* should be all set up and your *Angle Mode* should be correct and ready for curve placement. Go back to the beginning of **Step 3** if you're going to lay in another curve.

If, however you are going to construct a tangent from this point, you need to toggle *Smartline* back to its **Segment Type Lines** mode by typing a **Tilde** (~) into **AccuDraw**. Check that the change has been made in the **Tool Settings Window**.

It is not going to be necessary to enter in the *Bearing* for this next tangent. If we have constructed our curve correctly we can just let *AccuDraw* get the *Bearing* right for us.

Move your mouse around until *Smartline* looks like it's going to draw a tangent in the right direction (Figure 9-31). Hit the **Enter** key to activate *Accudraw's* **Smartlock**.

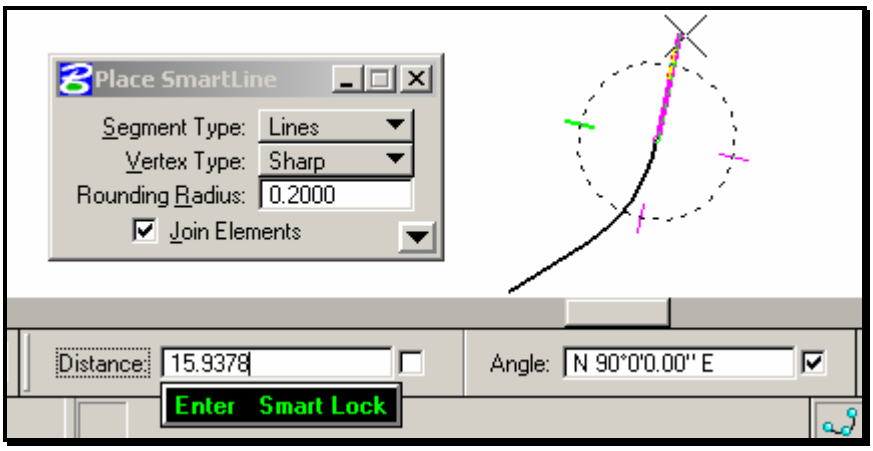


Figure 9-31: Construct Tangent Direction

Make sure you are in the **Distance** field by hitting your **Tab** key and type in the length of the Tangent

Note that this tangent distance is just the distance between the PT and the next PC or end of project. Enter a *Data Point* to accept this point.

Step Five: Troubleshoot and Prepare for Another Curve or Tangent

Again, make sure not to hit your *Reset* until you're done with your whole baseline. If you do hit your *Reset*, check out **Step 2** for a method of getting back on track.

From this point, you now have all the construction tools you need to create any sort of baseline. The next step will be to double-check the geometry you have laid out and make any necessary corrections. Then we'll go on to Stationing and Annotating

BASELINE CHECKING/CHANGING

Once you have your baseline constructed you're going to want to make sure you haven't made any mistakes. If you have, you're going to need to fix it up.

Drop Complex

It's going to seem strange since we went to all that trouble to make sure our alignment was a single element, but the first thing we're going to do when we check our baseline is to drop it up into separate elements. We're going to do this to make it easier to check the length of individual elements.

Pick the **Drop Element** tool from the **Main Tool Frame**. Check your **Tool Settings Window** and make sure that *Complex* is checked off (Figure 9-32). This ensures that *Complex Chains* will be dropped into their individual components.

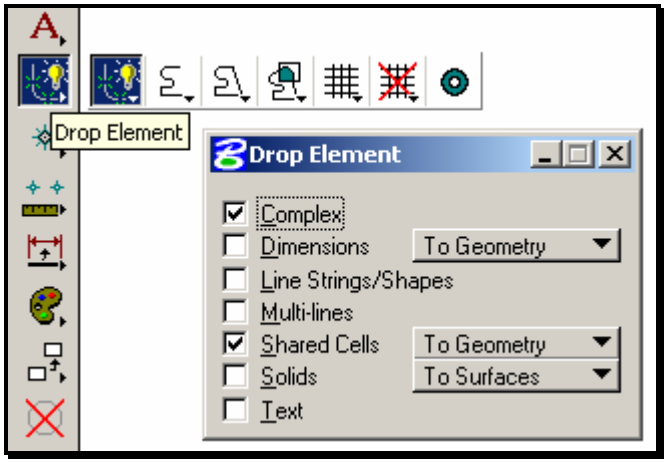


Figure 9-32: Drop Elements Complex

Check your *Status Bar* (at the bottom of your screen) for prompting about what to do next. It should tell you to "Identify element."

Data Point on the baseline. It will highlight, and your *Status Bar* will prompt you to "Accept/Reject (select next input)". *Data Point* to *Accept* and your baseline will be broken up into a series of lines and arcs. If there was an angle point on your baseline, you may have constructed a baseline that has two intersecting tangents. When you drop complex status of this baseline, this "elbow" is going to be preserved as a *Line String*. To drop that *Line String*, use *Drop Complex* again, making sure to have *Line Strings/Shapes* toggled on in your **Tool Settings Window**.

Measure Lengths

From the *Measure* toolbox, pick the *Measure Length* tool. This is a great tool for measuring the components of a baseline. It will tell us the length of tangents and curves, as well as the bearing of tangents. Make sure that you are reading angles in *Bearing* mode by pressing **F9**.

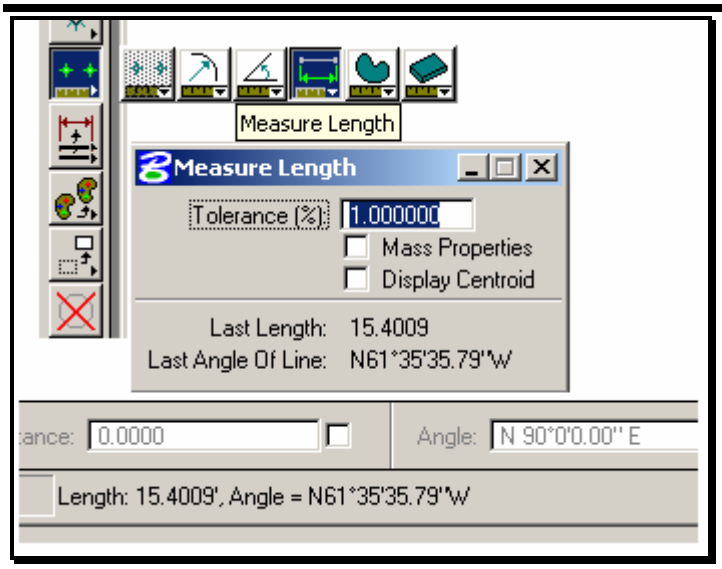


Figure 9-33: Measure Length

Your *Status Bar* will be prompting you to “Identify Element”. It is not going to be necessary to snap to the element to pick it here, just *Data Point* on the element you want to measure. It will highlight, and you’ll be prompted to "Accept/Initiate Measurement." *Data Point* to *Accept*, and MicroStation will display some information for you regarding this element. Look to the lower middle of your *Status Bar or the Measure Length Dialog* for the length of lines and arcs, as well as the bearing of lines (Figure 9-33).

Measure Radius of Curves

Once you have established the bearing of lines and the length of lines and arcs, you should double-check the radii of the curves of the baseline. From the **Measure** toolbox, choose **Measure Radius**. The *Status Bar* will prompt you to "Identify Element."

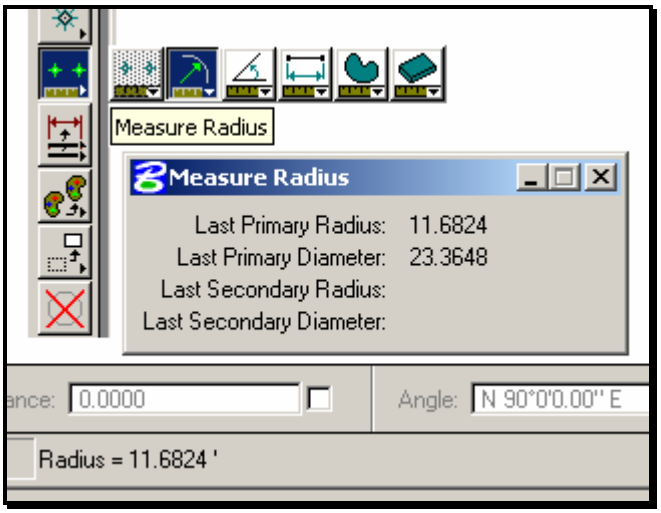


Figure 9-34: Measure Radius

Data Point on an arc and it will highlight. You'll be prompted to "Accept/Initiate Measurement." *Data Point* again and you will see the Radius being displayed in the lower middle of the *Status Bar or the Measure Radius Dialog* (Figure 9-34).

Fix the Problems

So you've found out that something isn't quite right with the baseline you've just constructed. There are a number of tools that we can use to fix it up.

Modify

The *Modify* tool is going to let us change the distance and bearing of lines, as well as the sweep angle (delta) and radii of curves. From the **Modify** toolbox on the **Main Tool Frame**, choose the **Modify** tool (Figure 9-35).

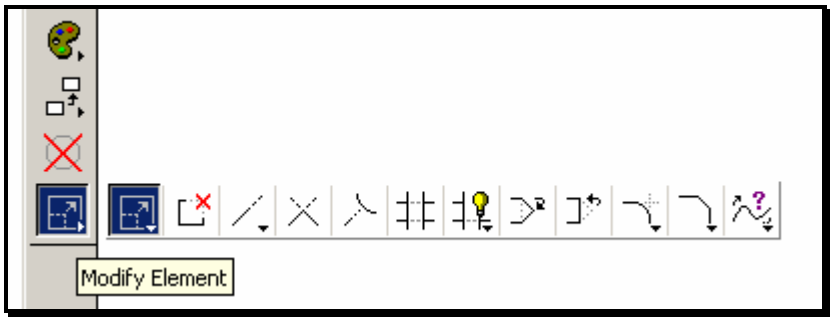


Figure 9-35: Modify Element

Rotate

Say you've made a change to the bearing of a tangent line. That is going to affect the curve that you previously constructed from that tangent. You need to use the *Rotate* tool to reorient that curve to align with your modified tangent.

From the **Manipulate** toolbox on the **Main Tool Frame**, choose the **Rotate** tool (Figure 9-36). From the **Tool Settings Window** make sure to set the **Method** to **3 Points**.

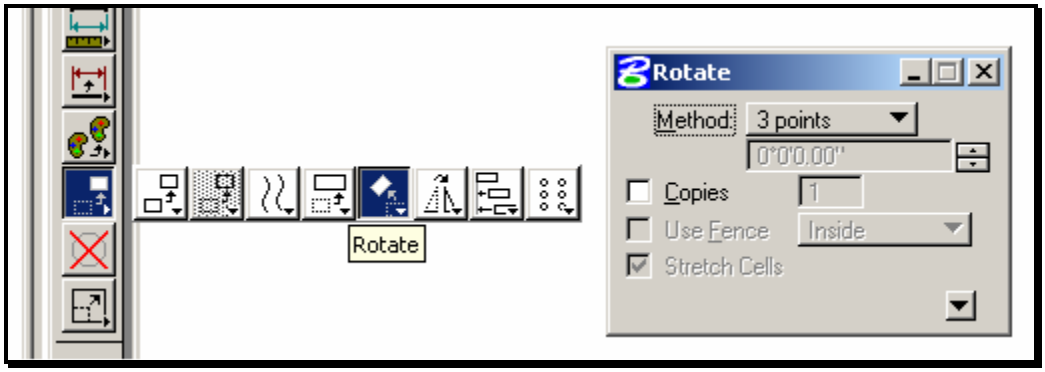


Figure 9-36: Rotate Element

It is also possible that you made a mistake on your initial bearing and need to reorient the rest of your baseline. You might have too many segments to want to fix them one at a time. You can use the *PowerSelector* to pick all of the elements that need to be reoriented (Figure 9-37). That makes it possible to rotate the entire baseline at once.

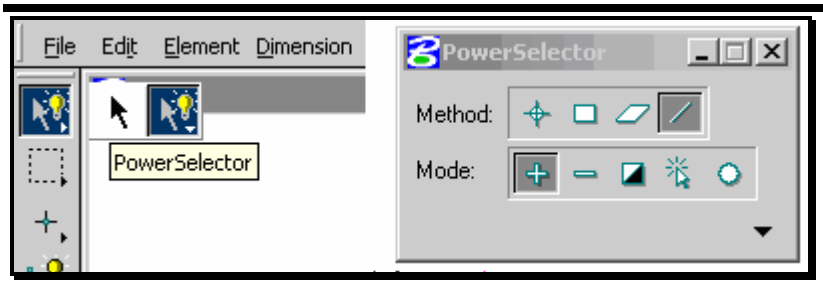


Figure 9-37: Power Selector

Punt

If it looks like it's going to be too complicated to modify and manipulate your baseline into shape, you can always wipe it out and start again. Practice is good.

Put It Back Together Again

Now that we've checked and rechecked and fixed all of the problems in our baseline, we're going to want to reassemble it into a *Complex Chain*. From the **Groups** toolbox, choose **Create Complex Chain**. In the **Tool Settings Window**, make sure to set the **Method** to **Automatic** instead of **Manual** (Figure 9-38). Your **Status Bar** is going to be prompting you to "Identify Element". Pick the first element in the baseline with a *Data Point*. The element will highlight. *Data Point* away to *Accept*.

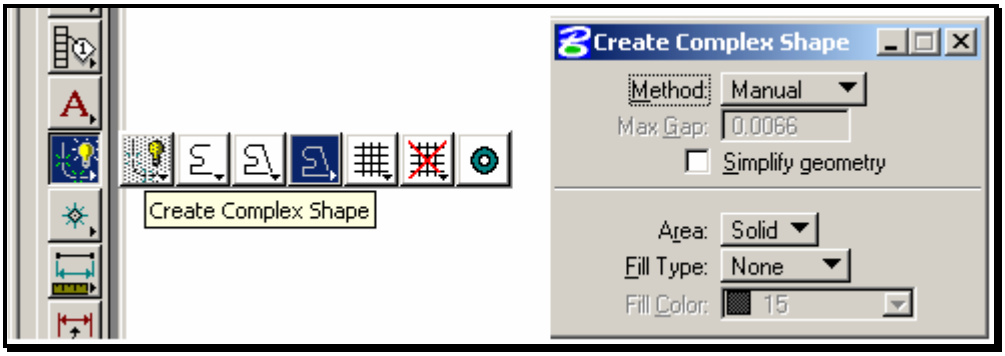


Figure 9-38: Create Complex Chain

Now MicroStation will look for another element to attach onto the end of this first element. Whatever element it can find at the end of that first element (within a certain distance: the "*Max Gap*") will be highlighted, and MicroStation will prompt you to "Accept Chain Element." *Data Point* to *Accept* each portion of the baseline as MicroStation finds it. If MicroStation cannot find an element, it will finish up the *Complex Chain*.

If for some reason MicroStation doesn't find elements that should be part of the baseline, the first thing you need to do is **Undo** the **Complex Chain** that you just created. If you don't do this, you're going to end up with lots of elements on top of each other by the time you're through recreating your baseline.

MicroStation may not have found elements to put on the end of the chain because they were too far away from the end of the element preceding them. This could be as simple as a missed snap or as complicated as a 3D issue. You should be able to resolve it by using the *Move* command (make sure to *PowerSelector* if you want to move the entire alignment

together) and carefully put the problem elements into place at the end of the baseline. If this doesn't work, try flattening the file (**Macros>Flatten)**. Then go back and recreate the *Complex Chain* from the first element again.

BASELINE STATIONING

There are going to be a couple of steps involved in Stationing. First we're going to label the PCs and the PTs. Then we'll use those points along with the *"Pointalong"* macro to find a beginning station. From there, we'll use the *Settings Manager* to place our stations.

Construct the PCs and PTs

Choose **BASELINE** from the *Settings Manager* to set the element attributes**.** The way to find the PCs and PTs is to snap to the ends of your curves. Place your cursor *near* the intersection of a tangent with a curve but ON the tangent and hit your middle button. You should see the tangent highlight and a crosshairs will appear at the end of the tangent (Figure 9-39). *Accept* this point with a *Data Point* to start the PC line.

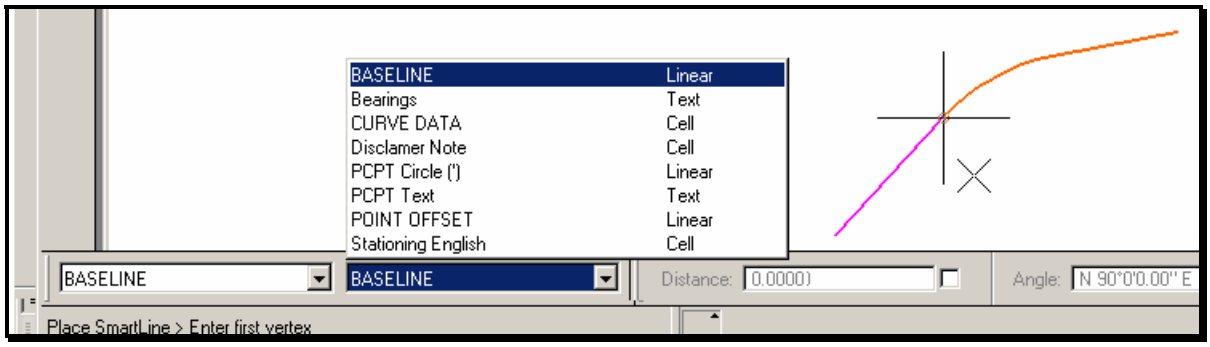


Figure 9-39: Snap to the End of a Curve

Choose **Center** as your *Snap Mode* and *Tentative snap* to the curve. Make sure **AccuDraw** is in **Distance/Angle** mode (the *AccuDraw Compass* will be a circle if it is). Type "150" (50 for metric) as your distance (making sure your cursor is in the *AccuDraw Distance* field.) This will lock your line to be pointed at the center of the curve (perpendicular to the Baseline) and 150 feet (50m metric) long. Accept by entering a *Data Point*.

Repeat this process for all PCs and PTs along the Baseline.

Double Check Your Baseline Chain

Step Zero at this phase is to make sure that your Baseline is all one element (*Complex Chain*). From the **Primary Tools,** pick the **Element Information** tool. MicroStation will prompt you to “Identify Element.” Pick on your Baseline with a *Data Point. Data Point* again to *Accept*. A dialog box will appear that will tell you (at the top) what kind of an element your Baseline is. The top of the dialog should say “Element Information for Complex Chain [Type 12]”. If it does, close the dialog and continue. If it doesn't, make it into a *Complex Chain*.

Generate a Station Marker

Once the PC’s and PT’s lines are drawn, you're going to use the Station of a PC or PT to locate an even 100’ (20m metric) Station on the Baseline. Press the **F12** key to run the *Pointalong* macro.

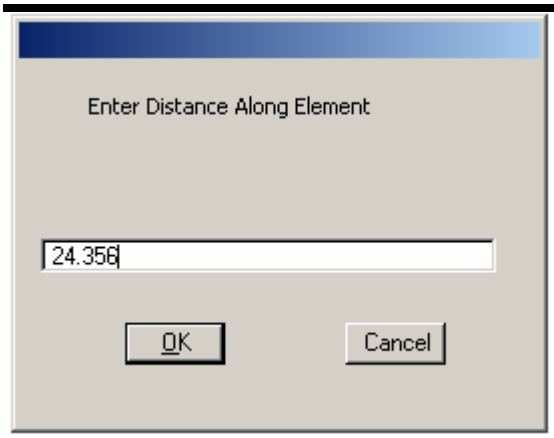


Figure 9-40: Point Along Distance

Data Point to *Accept* and MicroStation will prompt you to enter in a distance (Figure 9-40). Take the station of your PC or PT and calculate the distance to a nearby 100' (20m for metric) station (you do the math.) Enter this distance and push **OK.** MicroStation will prompt you to "Identify Direction for Construction." Enter a *Data Point* on the Baseline in the direction of the Station you want to place. Finish drawing the line at this point. This will serve as a *Station Marker Construction Line* for placing your Stationing in the next step.

Place Generic Stations

Now that we have a marker on an even Station, we can use the Stationing tools in the *Settings Manager* to begin to annotate. From the **Settings Manager**, choose **Baseline > Stationing Metric.**

MicroStation is going to prompt you to "Place Cell Along > Identify Element." We want to pick the Baseline, but we want to be certain to pick it at the point where our Station Marker Construction Line intersects the Baseline. We're going to do this by using the *Intersection* snap again. Make sure to snap to the Construction line first, then the Baseline. *Data Point* to *Accept* and it will show generic station markers at even intervals along your Baseline. At this point you will need to **Data Point** one more time to Accept this configuration.

Fill in the Station Information

What you have just placed is a series of tick marks along your Baseline. These tick marks are labeled by stations marked 0+00 (0+000 for metric). The next thing we have to do is change these stations to the proper values. These Underlined letters are a special kind of MicroStation text called *Enter-Data Fields.*

We are going to make changes to these Fields by using tools from the **Text** toolbox from the **Main Tool Frame** (Figure 9-41).

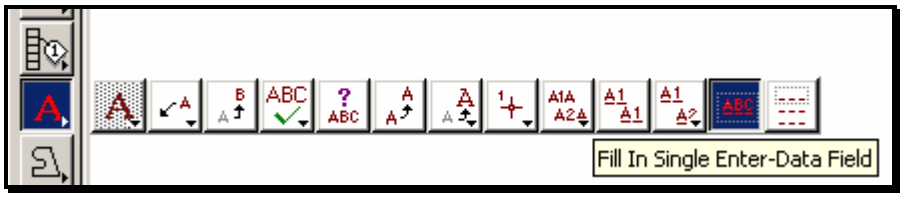


Figure 9-41: Fill in Single Enter Data Field

We're going to start by changing the value of the first Station on our Baseline. From the **Text** toolbox, choose the **Fill In Single Enter-Data Field** tool. MicroStation will prompt you to "Identify Element". Pick on the underlined characters of your first Station with a single *Data Point*. MicroStation will open the **Text Editor**. Type your Station into the **Text Editor** and hit **Enter** (Figure 9-42).

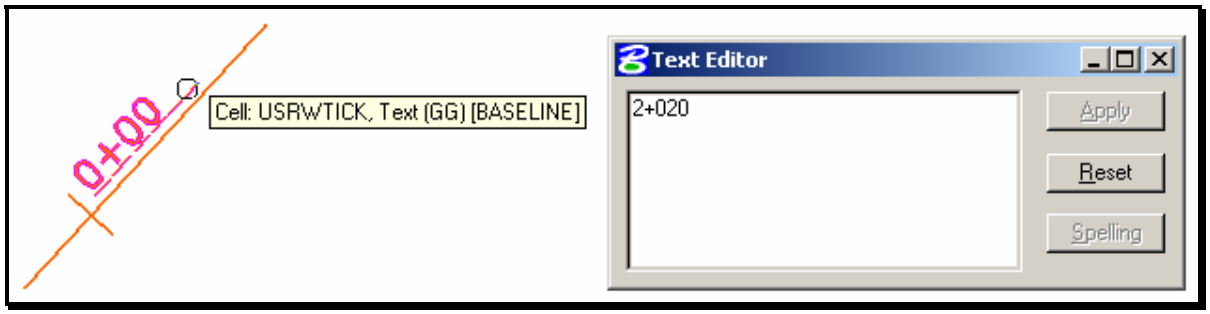


Figure 9-42: Pick an Enter Data Field (Metric Example)

MicroStation will put the text you typed into the **Text Editor** into the **Enter-Data Field** (Figure 9-43).

Figure 9-43: Data Point to Change the Field (Metric Example)

Once we have the first Station correct, it's going to be easy to fill in the rest of our Stations. We're going to use a tool that will copy our Data from that one field into each Station. For each Station we fill, MicroStation is going to add 100 to the value of the previous Station.

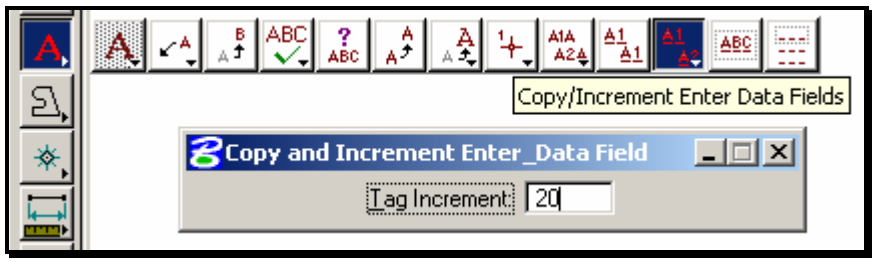


Figure 9-44: Copy/Increment Enter Data Fields

From the **Text** toolbox, pick the **Copy/Increment Enter-Data Fields** tool (Figure 9-44). On your **Tool Settings Window**, set your **Tag Increment** to 100 (20 for metric). MicroStation will prompt you to "Select enter data field to copy." *Data Point* on the field you just entered.

The Station value should appear in your Status bar. Now *Data Point* on the next Station. MicroStation will change the value of that Station to the next appropriate value.

Keep picking stations (in order) until you get station 2+100. MicroStation is not smart enough to put that hundred marker on the left side of the plus sign. Go back to the *Fill In Single Enter-Data Field* tool and change the station to 3+00. Then use the **Copy/Increment Enter-Data Fields** tool to continue stationing.

PTS AND CURVE DATA

There are only a couple of tricks to labeling the PCs, PTs and Curve Data.

Text Placement Options

The first step here is to label the PCs and PTs. MicroStation has a couple of text placement features that are going to make this an easy process. When you place text, you have a number of options about how that text is going to get stuck into the drawing. By default, your text placement method is **By Origin**. This method hangs the text off the end of your cursor and stamps it into the drawing wherever you click.

The methods that we're going to be using to label the PCs and PTs are **Above Element** and **Below Element** (Figure 9-45). When you use these methods, you type in the text you'd like to place, and then *Data Point* on an element. MicroStation will then place in the text you've typed either *Above* or *Below* that element.

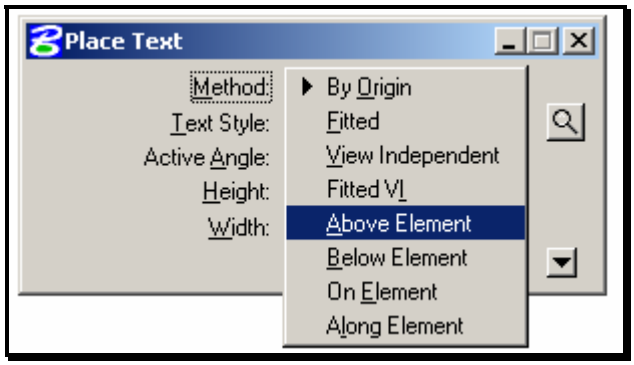


Figure 9-45: Text Placement Methods

We will also be setting the **Justification** value to either a **Right Top** or a **Left Top Justification**. If the PC/PT line is on the Right of the Baseline, we'll be using the **Right Top Justification**. If the PC/PT line is on the Left of the Baseline, we'll be using the **Left Top Justification**. To set the *Justification*, expand by click the arrow in the lower right corner of the *Place Text Dialog.*

Label the PCs and PTs

From the **Settings Manager** choose **Baseline > PCPT Text**. This will set your active text height, width, and font and will launch the *Place Text* command. Based on the desire to keep the PC and PT labels to the INSIDE of the curve, make a decision about whether your current PC or PT should be **Above** or **Below** the PC/PT line. Select **Above** or **Below** from the **Method** section of the **Place Text Tool Settings Window**. Select a **Justification** from the same **Tool Settings Window** (Figure 9-46).

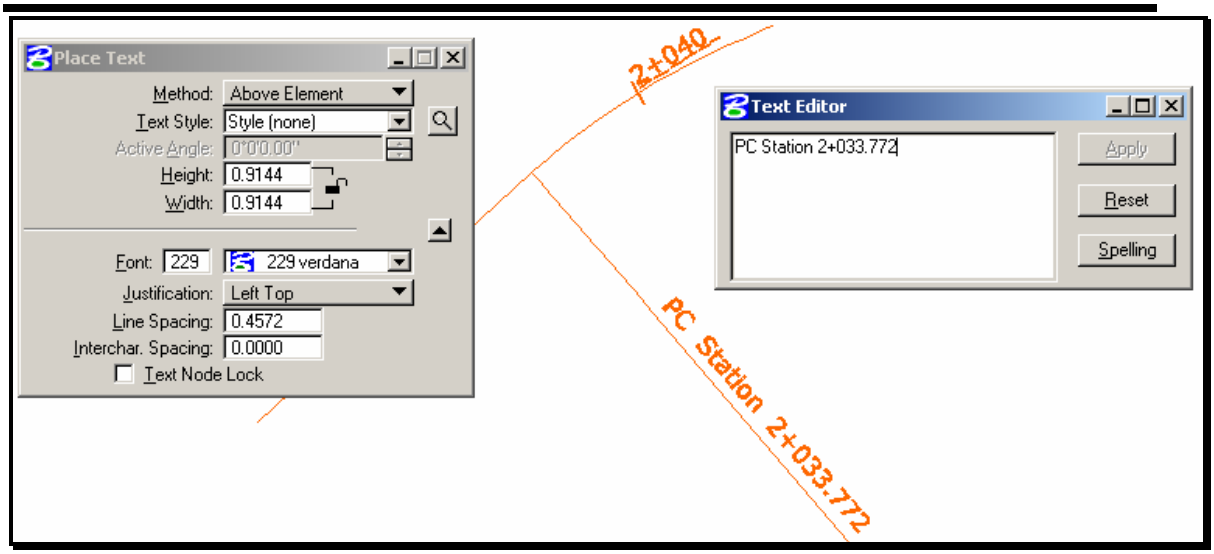


Figure 9-46: Labeling a PC (Metric Example)

Type your text into the **Text Editor** and place it on your PC/PT line by snapping (*Keypoint*) to the end of the line. **Data Point** to Accept and MicroStation will highlight the line (Figure 9-46). **Data Point** again and it will place the text.

Place PC/PT Circles

Next we need to place circles (of radius 2.5' (.75m metric) at the PC and PT point on the Baseline. From the **Settings Manager** choose **Baseline** > **PCPTCircle (m)** or **>PCPTCircle (')**. This will stick the appropriately sized circle on the end of your cursor. Stamp it into place by snapping to the ends of the PC/PT lines.

Place and Edit Curve Data

Once you have labeled the PC and PT lines with text and circles, it's time to place Curve Data on the Baseline. Our Curve Data is stored in a cell in our ROW cell library. We're going to place the cell onto our drawing as many times as necessary to label all of our curves. For each one, we're going to want to try to rotate the cell such that it's aligned with the radius of the curve at the center of the curve's length.

From the **Settings Manager**, choose **Baseline > Curve Data** (Figure 9-47). This will pick our Curve Data cell from our cell library and stick it on the end of your cursor.

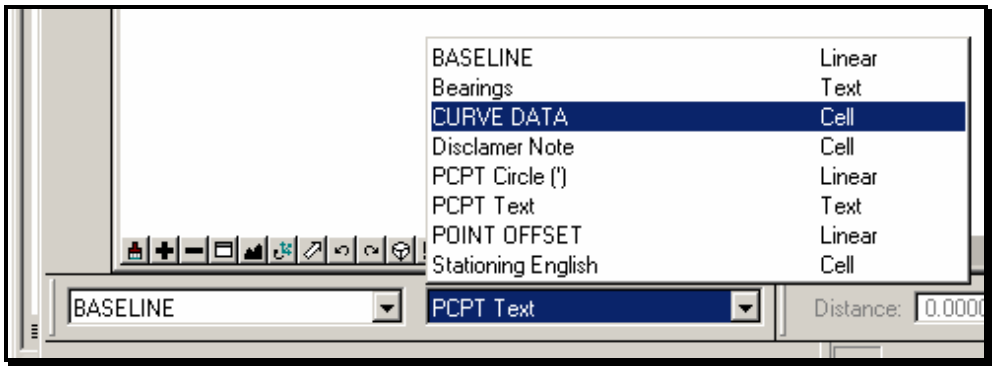


Figure 9-47: Choose Baseline>Curve Data

When the *Cell Tools Dialog* appears click on the **Place Cell and Rotate Icon** (Figure 9-48). By adjusting the number of degrees in the **Angle** field of the **Place Cell and Rotate Dialog** can be placed between the PC and PT of the curve with a *Data Point*.

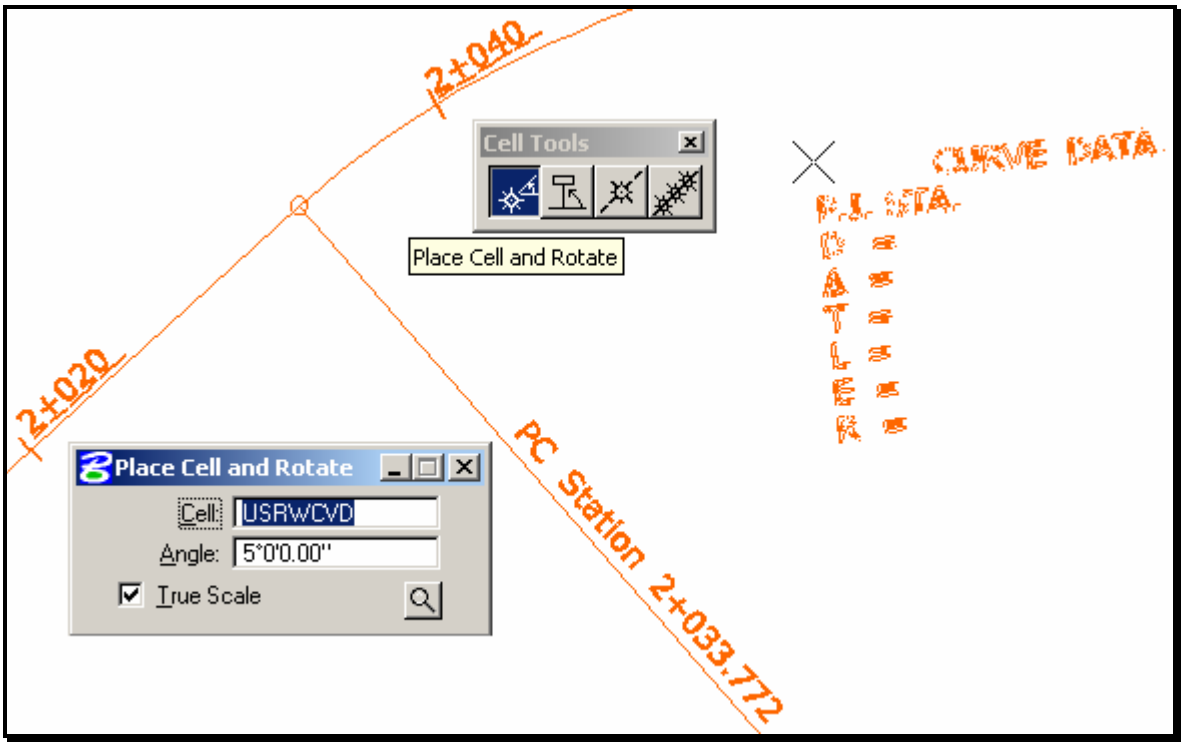


Figure 9-48: Placing Curve Data

Once your Curve Data is in the right place on your drawing, you are going to have to edit it to the correct values. Since you can't edit text that is in a cell, we're going to have to start by *Dropping* the cell into its *Components*.

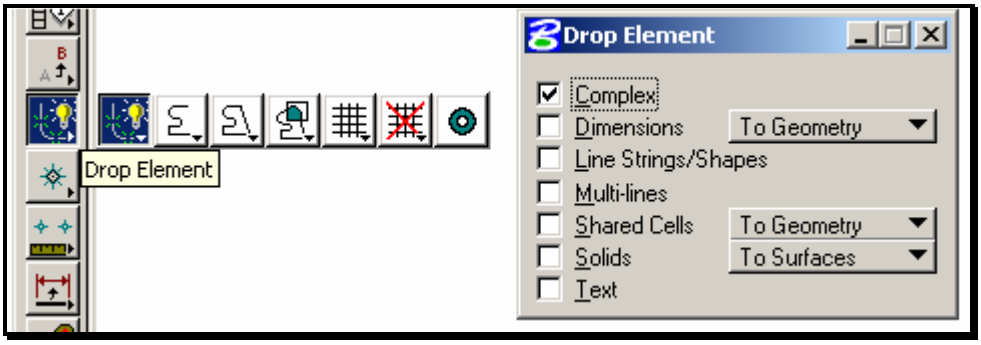


Figure 9-49: Drop Element Tool Settings

From the **Main Tool Frame**, pick **Drop Element**. Look at your **Tool Settings Window** and make sure that **Complex** is turned on (Figure 9-49). MicroStation will prompt you to "Identify Element." Pick on the Curve Data Cell. It will highlight, and you will *Accept* with a *Data Point* to complete the *Drop*.

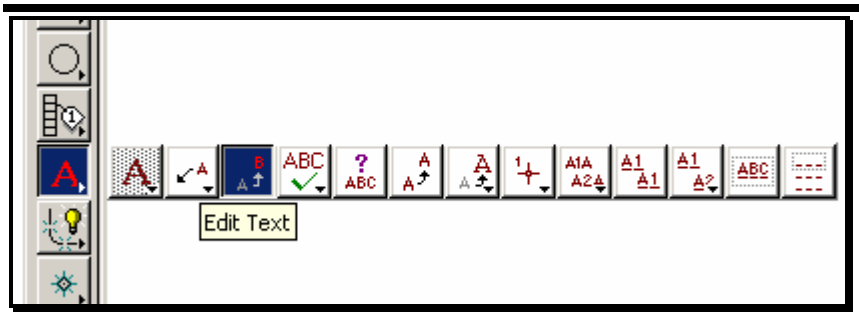


Figure 9-50: Edit Text Button

Once the Curve Data has been dropped, use your *Edit Text* tool to change the values to reflect your current curve (Figure 9-50).

RESOURCES

ROW FUNCTION KEYS

F1	Flatten Flattens your active file to 0 elevation
F2	Window in
F3	Zoom Out
F4	Update View
F5	*Powerselector*
F6	Fence
F7	*AccuDraw* On/Off
F8	Set Angle Mode to Conventional
F9	Set Angle Mode to Bearing
F10	Distance Macro measures along element and gives you options on how you can label distances.
F11	Perpendicular Snap
F12	Construct Point at Distance and Offset
Alt+F1	Works similar to a refresh/ clear
Alt+ F2	Acre/square Feet Macro Automatically changes Square meters to feet or acres and places on your pointer.
Alt+ F3	/actan2 changes your active angle with 2 hit points for placing text.
Alt+ F4	Reserved for Closing Windows/Files
Alt+ F5	Copy Parallel & Change Attributes (Color, Style, Level, Etc.)
Alt+ F6	
Alt+ F7	
Alt+ F8	
Alt+ F9	
Alt+ F10	
Alt+ F11	
Alt+ F12	Copy Parallel
Shift+F1	
Shift+ F2	
Shift+ F3	

Shift+ F4	
Shift+ F5	
Shift+ F6	
Shift+ F7	
Shift+ F8	
Shift+ F9	
Shift+ F10	
Shift+ F11	
Shift+ F12	
Ctrl+F1	
Ctrl+ F2	
Ctrl+ F3	
Ctrl+ F4	
Ctrl+ F5	
Ctrl+ F6	
Ctrl+ F7	
Ctrl+ F8	
Ctrl+ F9	
Ctrl+ F10	
Ctrl+ F11	
Ctrl+ F12	Move Parallel

Chapter 10 Hearing Sheets

Chapter 11 Environmental Sheets

MHPC DOCUMENTATION

Quick Punch List

- Create a MHPCPlan.dgn using Make Sheetz
- Copy or Place New Clip Boundaries
- Create Cut Sheets
- Run Border Macro
- Place Legend
- Edit Sheet Info. (Title Only)
- Send to Color Plotter

VIEWING A PROJECT USING MHPC COLOR SCHEME

Step One: Start MicroStation

Double-click your MicroStation icon. Click the ***Project*** pull-down and pick on your PIN. Select **EnvPlan.dgn** from your list of files and click OK.

- Picking your project from the pull down should bounce you to your project's Environ\MSTA folder. If it doesn't, contact CADD Support.

Step Two: Creating a MHPC File

Go to **File>Make Sheetz.** When the dialog opens, select "No Prefix" and pick "Environ" as your workgroup (Figure 11-1). Click OK.

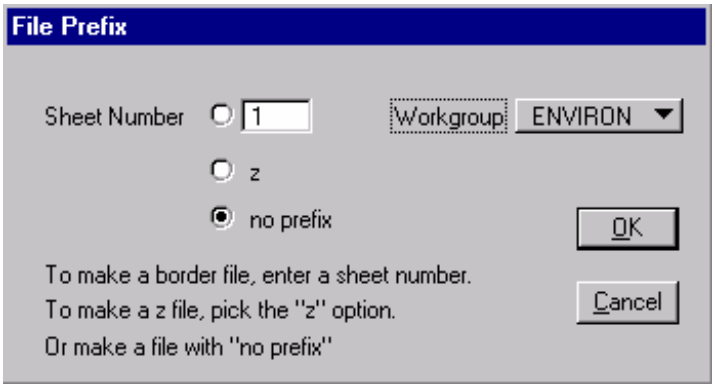


Figure 11-1: File Prefix and Workgroup Selected

From the list of available drawings pick MHPCPlan and click OK (Figure 11-2). This creates the new file and opens it.

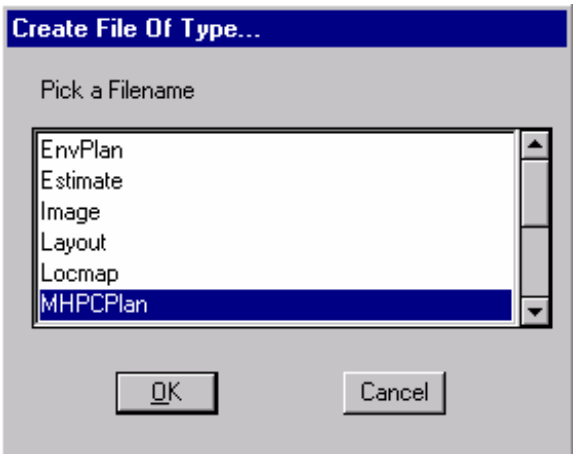


Figure 11-2: Select MHPCPlan

Step Three: Adjust Background to White

Select **Workspace>Preferences** from the Main Menu. In the next dialog, select **View Windows** from the left side of the dialog. On the right, place a check in the *Black Background->White* box. Click OK (Figure 11-3).

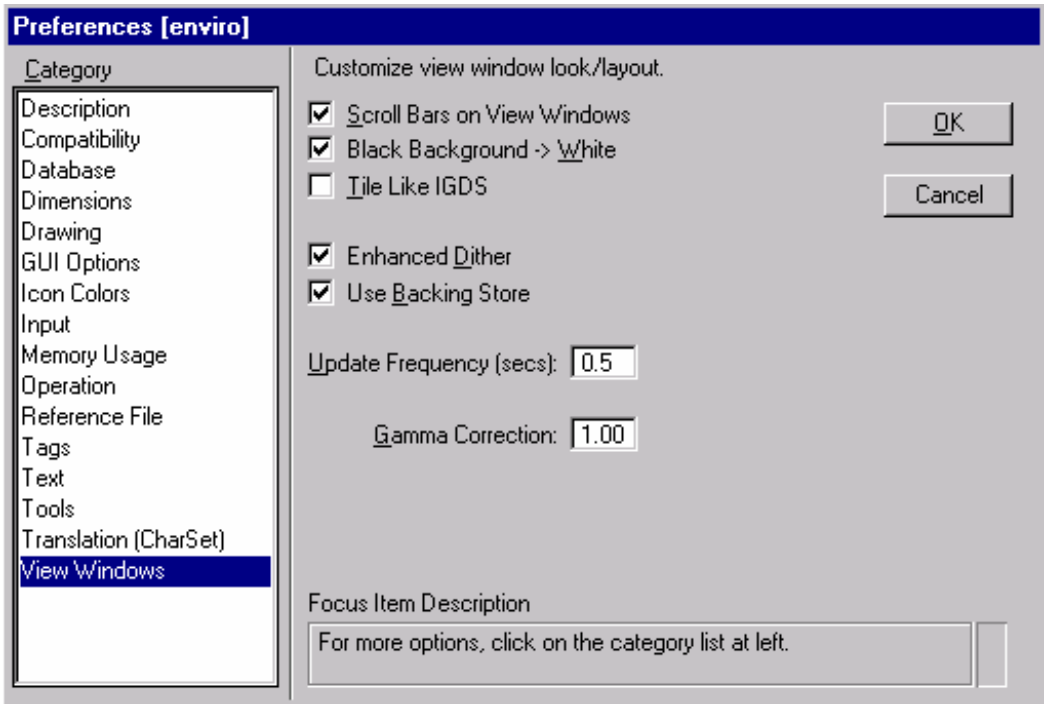


Figure 11-3: Preference set to White Background

Check your colors for accuracy. Sometimes you will find that standardization is not followed and you will need to adjust the colors of levels in a reference file or two. Do this in this file.

✓ *Please refer to 11-8 for more information on Changing colors Manually.*

♫ If your color scheme doesn't appear to be correct, make sure that your view attributes (**Settings>View Attributes)** has *Level Symbology* checked. It should set correctly by default. Contact CADD Support for more assistance.

ⓘ ***In attempts to stabilize this process, we created a pentable that <u>will not</u> use Symbology. Instead, the pentable will adjust colors at plot time only. If the colors do not appear to be accurate using Symbology, instead, turn off Symbology and hit the Print Icon. Browse to the correct plotter and attach the "MHPC-no Symbology" pentable. Use your preview in the print dialog to see if the colors are better represented.***

CREATING MHPC PLAN SHEETS

Step One: Temporarily Attach HDPLAN or BDPLAN.dgn (Optional)

As a time saver you can use another programs *Clip Boundaries* instead of placing your own manually. Depending on the type of project *Bridge or Highway,* use **File>Reference DOT>Attach** and browse to the appropriate groups \MSTA directory and select **bdplan.dgn** or **hdplan.dgn.** No logical is needed, set the nesting to **Copy Attachments** and **depth** to "0" (or use **No Nesting)** and click OK.

- If there aren't any clip boundaries in the bdplan.dgn or the hdplan.dgn, you will have to place your own boundaries manually.

Step Two: Copy Clip Boundaries

Now we need to merge the clip boundaries into the active file. This will produce clip boundaries for the MHPC plans that cover the same area as the plans sheets for the project. This procedure is assuming that you want a MHPC plan for every plan sheet. If you only need a MHPC plan for specific areas on your project, place clip boundaries manually in your active file as you would when creating the normal plan drawings.

✓ *Refer to page 5-5 for the procedure on placing clip boundaries manually.*

In the Reference File dialog, highlight the reference file (**plan.dgn) then select **Tools>Merge Into Master** from the Menu Bar. Now you will be prompted to select a view by clicking a data point anywhere on your top view. An informational dialog will open telling you that you are about to merge one reference file into the current design file. This is what you want to do. Select **OK** to start the procedure. Refresh your window to update the view in order see your clip boundaries in the active file.

Step Three: Create the Cut Sheets

Part One: Activate Macro

From the *Settings Manager* select **Create Plan Sheets > Create Cut Sheets**.

Part Two: Supply Starting Number

It asks you what number you want to use for the starting number of the MHPC plan sheets (Figure 11-4). Use the default "1". This will appear in your border as your sheet number.

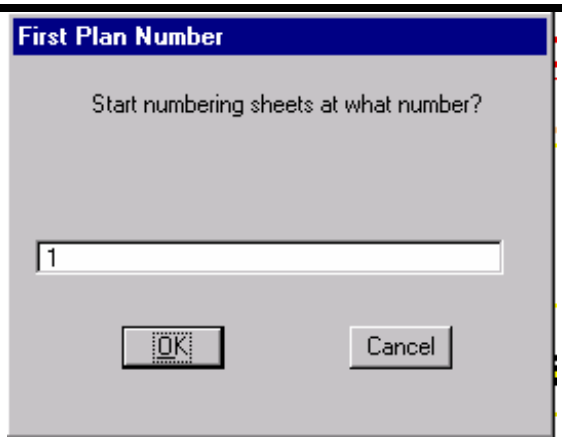


Figure 11-4: Start Numbering At?

Part Three: Sit Back and Watch

When the program is finished, it will drop you back into MHPCPlan.dgn. Open up the files you've just created and see how they look!

Step Four: Troubleshooting

If you open a MHPC plan sheet drawing and the graphics within the sheet are not correct, it could mean that one the drawings that is referenced in is not at the same Global Origin as the other drawings. If the graphics aren't aligned with your border, try and re-cut the sheets again. It won't be necessary to place new boundaries. Normally this will fix the problem. See CADD Support for assistance if needed.

EDITING MHPC PLAN SHEETS

Step One: Run the Border Information macro

The Border contains variables that can be replaced by a macro. It is not necessary to edit anything on this drawing that contains a $ or @ (i.e. $TOWNORCITY$). Select **Macros>Border Information** to run the macro. Process all of your sheets.

✓ *Please refer to PCF Editing on page 1-25 if the variables do not get filled in with the proper information.*

Step Two: Place MHPC Legend

Right click on the *Settings Manager* and select **Category>Scale.** Set the scale to 1 in. = 25 ft. (1:250 for metric) or 1 in. = 50 ft. (1:500 for metric). Select **Create Plan Sheets** from the left hand side of the *Settings Manager* (Figure 11-5).

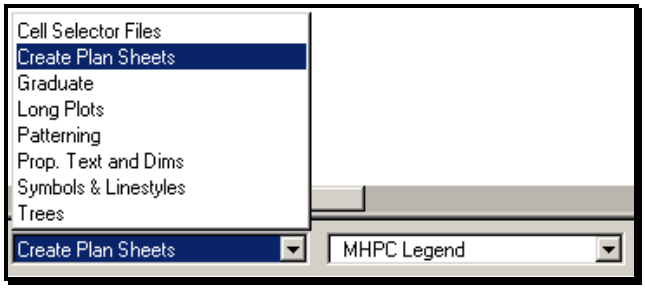


Figure 11-5: Create Plan Sheets

Select **MHPC Legend** from the right (Figure 11-6).

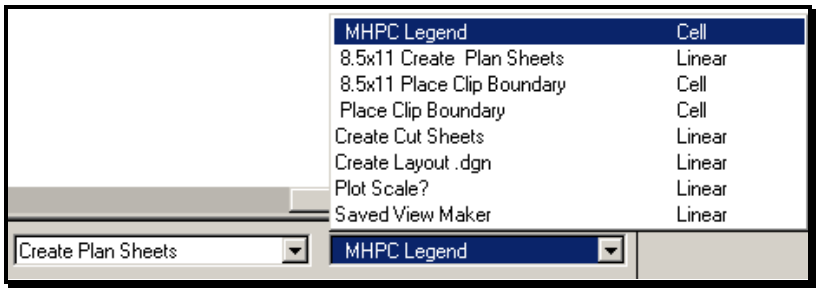


Figure 11-6: Pick MHPC Legend

Place the cell down where you want it with a left mouse click.

Step Three: Edit the Plan Type in the Title Box

The only text that needs to be edited on the border is the word "PLANS". Select **Text>Edit Text** from the menu and click on the word PLANS. When it highlights, click again to accept. When the *Text Editor* window opens, type MHPC in front of the words PLAN and hit *Apply.* Right Click to stop editing the text.

Step Four: Repeat as Necessary

Repeat **Step One** and **Step Two** on all of your ###_MHPCPlan#.dgn drawings.

ADJUSTING COLORS MANUALLY IN REFERENCE FILES

Sometimes you will find that standardization is not followed and you will need to adjust the colors of levels in a reference file or two.

ⓘ ***In attempts to stabilize this process, we created a pentable that will not use Symbology. Instead, the pentable will adjust colors at plot time only. If the colors do not appear to be accurate using Symbology, instead, turn off Symbology and hit the Print Icon. Browse to the correct plotter and attach the "MHPC-no Symbology" pentable. Use your preview in the print dialog to see if the colors are better represented.***

If you need to adjust the symbology (colors) of a reference files, do this in the **MHPCPlan.dgn** file and the change will reflect on all of your plan sheets. Open your *Level Manager* by selecting **Settings>Level Manager** from the *Main Menu* (Ctrl+L). Make sure that the *Symbology* pull down is set to **Overrides.**

Use **Quality>Analyze Element** and click on the element in question to find out what reference file the element resides in and the level it is on.

In the example below (Figure 11-7), the topo.dgn has two levels, **UTILS GRND** and **UTILS AERIAL,** that are the wrong color. They should be color "14". Expand the directory tree on the left and select **topo.dgn.** Select a single or multiple levels on the right and click on either of the color boxes. A color chart will open (Figure 11-8) allowing you to pick the color to change it to. Click on the color to see the number associated to it. Click OK.

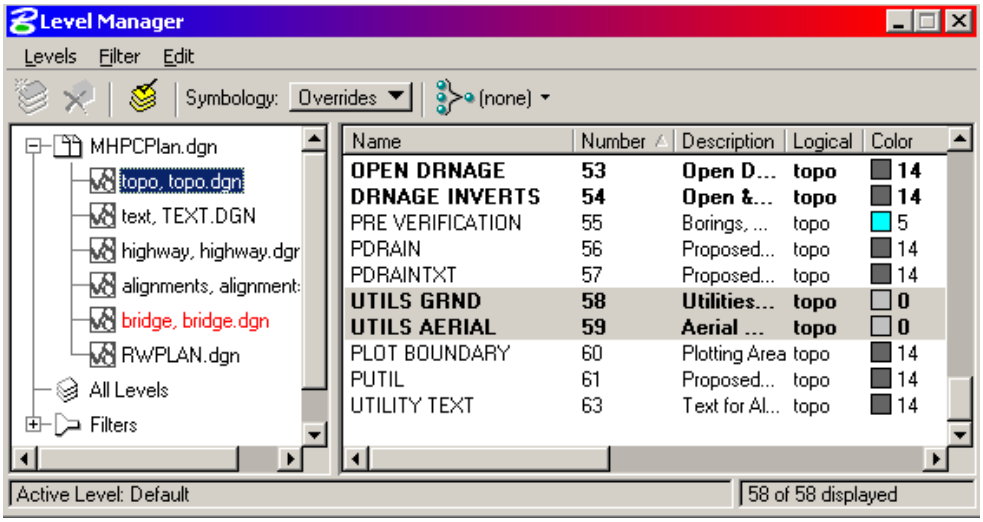


Figure 11-7: Example of selecting two levels within the topo reference file

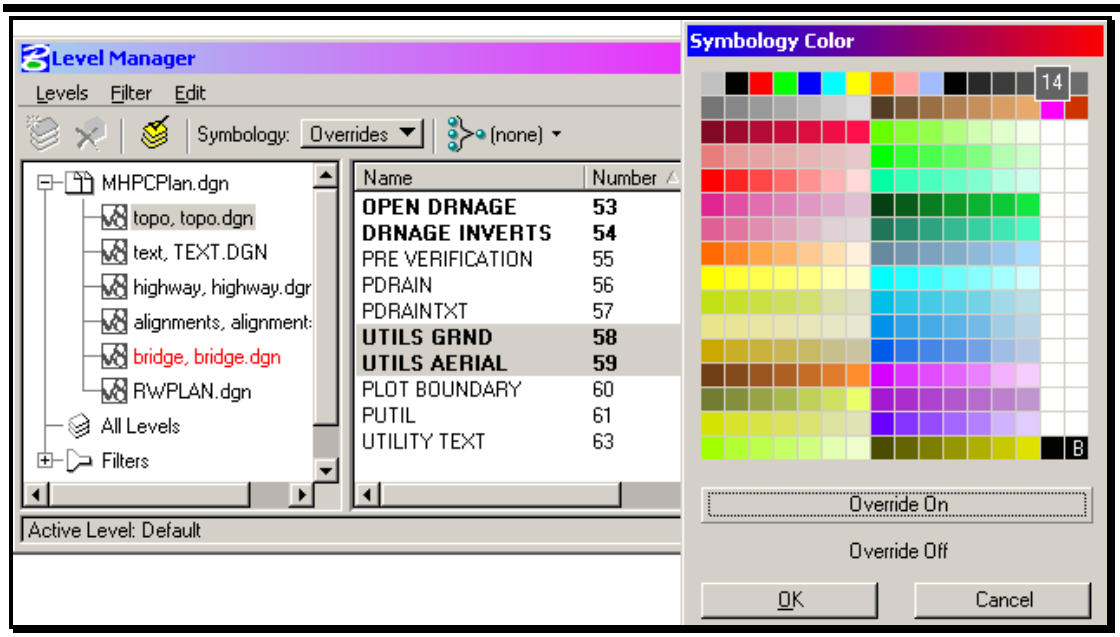


Figure 11-8: Example of selecting a new color for a level(s) within a reference file

Select **File>Save Settings** to save the adjustment.

BATCH PRINTING MHPC PLANS SHEETS

Step One: Open Batch Print Dialog

Select **File>Batch Print/Plot (DOT)** from the dialog Menu. Click Cancel at the *Open job Set* dialog window.

Step Two: Select a Printer

Highlight *Printer* from the *Specifications Controlling Plotting* area of the dialog. Select **Specifications>Select** from the menu or click the little green icon. Choose **US_HPCOLORRoom303** (**HPCOLORRoom303** for metric). Click OK.

Step Three: Select Print Area

Default *Print Area* **MDOT Standard** is correct by default for U.S. Customary projects. (Change this to **Divisions** for metric projects.)

Step Four: Select a Display (Pentable)

Pentable that uses Level Symbology

Highlight *Display* from the *Specifications Controlling Plotting* area of the dialog. Select **Specifications>Select** from the menu or click the little green icon. Choose **Color_MHPCplans** and click OK. This pentable utilizes *Level Symbology.*

Pentable without Level Symbology

Highlight *Display* from the *Specifications Controlling Plotting* area of the dialog. Select **Specifications>Select** from the menu or click the little green icon. Choose "MHPC-no Symbology" and click OK. This pentable does not utilize *Level Symbology*. Test this using method below.

ⓘ ***In attempts to stabilize this process, we created a pentable that <u>will not</u> use Symbology. Instead, the pentable will adjust colors at plot time only. If the colors do not appear to be accurate using Symbology, instead, turn off Symbology and hit the Print Icon. Browse to the correct plotter and attach the "MHPC-no Symbology" pentable. Use your preview in the print dialog to see if the colors are better represented.***

Step Five: Add Design Files

Select **Edit>Add Files** from the menu. Select all of your numbered MHPCplan drawings. Click the *Add* button. Click Done.

Step Six: Send the Plots

Click the printer icon or select **File>Print** from the *Batch Print dialog* menu to send all sheets to the plotter.

If you don't want to send them all, highlight only the files you want to plot. At this point you can send just the ones you have selected. Click OK.

WETLAND PLANS

Quick Punch List

- Copy or Place New Clip Boundaries
- Use Others or Create Cut Sheets
- Run Border Macro
- Send to Color Plotter

Need to Find Wetland Drawings?

The wetlands should be automatically attached if they were surveyed with the original topo.dgn or if the Topoadd and Textadd files have been cleaned up and merged properly. If not, they were picked up with other means (GPS) and they may be residing in a Topoadd# and Textadd# files sitting in the Survey/MSTA folder. Browse to the Survey/MSTA and open the Topoadds to see which one contains the wetland information. There may be an **OrigWetlands** file in the folder. In either case, these files need to be cleaned-up and either merged into the topo.dgn or copied into the topo folder.

✓ ***Users should refer to Chapter 3 Survey Clean-up and treat an OrigTopoadd# and OrigTextadd# file as "Additional Topo Clean-up" (3-35).***

✓ ***Users should refer to Chapter 3 Survey Clean-up and treat an OrigWetlands as "Initial Wetlands Clean-up" (3-49).***

For a quick plot use **File>Reference (DOT) Attach** and attach the files directly from the Survey\MSTA folder to your Envplan.dgn or Wetlands-clips.dgn using **Coincident World** method. These files will not stay attached for future plotting as the Survey folder is not recognized as a valid path to reference files. Consider cleaning up these files to avoid this from happening.

♫ In the near future, there will be a separate drawing for wetlands. Cleaning up the wetlands.dgn will be the responsibility of the Environmental staff. Details of the cleanup will be in Topo Cleanup section of this manual. The wetlands.dgn will be attached to Envplan.dgn and Wetlands-clips.dgn by default, however there are many old projects that will require the users to attach it manually. The wetlands.dgn will exist in the **Survey\MSTA** folder within your PIN and will be copied into your **topo** folder and cleaned up. Additional wetlands will be handled very similar to the Topoadds.

✓ *Please refer to 3-49 for information on Wetlands cleanup.*

PLOTTING WETLAND PLANS FOR BIOLOGIST'S (USING OTHERS PLAN SHEETS)

Introduction

When plotting wetlands for checking purposes, it may be easier to use the plan sheets cut by another workgroup as opposed to creating your own. You can open someone else's plan sheets (i.e. 011_hdplan1.dgn or 005_bdplan1.dgn) to check and see if the information you need is displayed on them. If topo cleanup is done properly, wetland lines and flags should be displayed. If not, you can ask the Program (Urban and Arterial, Bridge or Regional) to go through the process of cleaning up the additional topo and text files or consider cleaning them up yourself.

Step One: Start MicroStation

Double-click your MicroStation icon. Click the ***Project*** pull-down and click on your PIN.

Step Two: Open Any Drawing

Select any file in your list of files in your workgroups \MSTA folder (i.e. Envplan.dgn). Click OK to open it.

Step Three: Batch Printing - Create a New Batch Job

Part One: Open Batch Print Dialog

Select **File>Batch Print/Plot (DOT)** from the dialog Menu. Click Cancel at the *Open job Set* dialog window.

Part Two: Select a Printer

Highlight *Printer* from the *Specifications Controlling Plotting* area of the dialog. Select **Specifications>Select** from the menu or click the little green icon. Choose **US_OCE9800FULL** or **US_OCE9400FULL** (OCE9800FULL or OCE9400FULL for metric). Click OK.

Part Three: Select Print Area

Default *Print Area* **MDOT Standard** is correct by default for U.S. Customary projects. (Change this to **OCE** for metric projects.)

Part Four: Select a Display (Pentable)

Highlight *Display* from the *Specifications Controlling Plotting* area of the dialog. Select **Specifications>Select** from the menu or click the little green icon. Choose **graysurvey_wetlands** and click OK.

Part Five: Add Design Files

Select **Edit>Add Files** from the menu. Depending on the type of project and who has cut the plan sheets, browse to the workgroup's MSTA folder (i.e. highway\MSTA or

bridge\MSTA). Select all of the plan sheet drawings (i.e. 011_hdplan1.dgn or 005_bdplan1.dgn). Click the *Add* button. Click *Done*.

Part Six: Save your Batch Print job

Select **File>Save As…** and give you Batch Print a logical name so you can print it again if the need arises (i.e. Wetland_ck_OCE9800.job).

Part Seven: Send the Plots

Click the printer icon or select **File>Print** from the *Batch Print dialog* menu to send all sheets to the plotter.

If you don't want to send them all, highlight only the files you want to plot. At this point you can send just the ones you have selected. Click OK.

CREATING WETLAND PLAN SHEETS FOR BIOLOGIST'S

Introduction

If you are required to create plan sheets for checking Wetlands and are unable to get what you need through another workgroups existing plan sheets, you can place your own clip boundaries or copy another workgroups clips into the Wetlands-clips.dgn without effecting other work to be done in the file (i.e. Army Corps. 8 ½ x 11 sheets).

Step One: Create a Wetlands-clips Drawing

It is now necessary to create a Wetlands.dgn within the ENVIRON\MSTA folder to create cut sheets for the Wetlands. Use the **File>Make Sheetz** macro to create a Wetlands-clips.dgn file. Select "No Prefix" and select "Wetlands-clips" from the list of available drawings. Hit *Cancel* to stop making sheets.

Step Two: Temporarily Attach HDPLAN or BDPLAN.dgn (Optional)

As a time saver you can use another programs *Clip Boundaries* instead of placing your own manually. Depending on the type of project *Bridge or Highway,* use **File>Reference DOT>Attach** and browse to the appropriate groups \MSTA directory and select **bdplan.dgn** or **hdplan.dgn.** No logical is needed, set the nesting to **Copy Attachments** and **depth** to "0" (or use **No Nesting)** and click OK.

- If there aren't any clip boundaries in the bdplan.dgn or the hdplan.dgn, you will have to place your own boundaries manually.

✓ *Refer to page 5-3 for the procedure on placing clip boundaries manually.*

Step Three: Copy Clip Boundaries

Now we need to merge the clip boundaries into the active file. This will produce clip boundaries for the Wetland plans that cover the same area as the plans sheets for the project. This procedure is assuming that you want a Wetland plan for every plan sheet. If you only need a Wetland plan for specific areas on your project, place clip boundaries manually in your active file as you would when creating the normal plan drawings.

✓ *Refer to page 5-3 for the procedure on placing clip boundaries manually.*

In the Reference File dialog, highlight the reference file (??plan.dgn) then select **Tools>Merge Into Master** from the Menu Bar. Now you will be prompted to select a view by clicking a data point anywhere on your top view. An informational dialog will open telling you that you are about to merge one reference file into the current design file. This is what you want to do. Select **OK** to start the procedure. Refresh your window to update the view in order see your clip boundaries in the active file.

Step Four: Create the Cut Sheets

Part One: Activate Macro

From the *Settings Manager* select **Create Plan Sheets** > **Create Cut Sheets**.

Part Two: Supply Starting Number

It asks you what number you want to use for the starting number of the Wetland plan sheets. Use the default "1" (Figure 11-9). This will appear in your border as your sheet number.

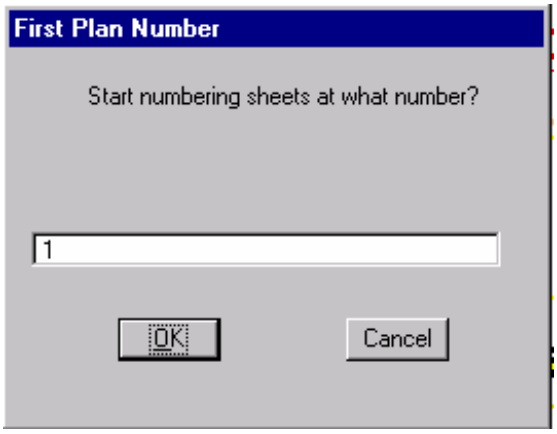


Figure 11-9: Start Numbering At?

Part Three: Sit back and watch

When the program has finished, it will drop you back into Wetlands.dgn. Open up the files you've just created and see how they look!

Live Nesting

What is Live Nesting? This is a new method in MicroStation V8 of attaching a file with references to another file like our border sheets. By using Live Nesting you no longer need to use the old methods of **Batch>Attach** and **Batch>Settings** to manipulate the way you want your cut sheets to appear for plotting purposes. Now if you want to turn off certain levels, adjust displays of reference files or attach/detach additional reference files, you can simply do this in your source drawing (i.e. Wetlands-clips, HDPlan, BDPlan, Envplan, etc.) and all of your border files will be displayed in the same manner.

Step Five: Troubleshooting

If you open a Wetland plan sheet drawing and the graphics within the sheet are not correct, it could mean that one the drawings that is referenced in is not at the same Global Origin as the other drawings. If the graphics aren't aligned with your border, try and re-cut the sheets again. It won't be necessary to place new boundaries. Normally this will fix the problem. See CADD Support for assistance if needed.

Step Six: Batch Printing - Create a New Batch Job

Part One: Open Batch Print Dialog

Select **File>Batch Print/Plot (DOT)** from the dialog Menu. Click Cancel at the *Open job Set* dialog window.

Part Two: Select a Printer

Highlight *Printer* from the *Specifications Controlling Plotting* area of the dialog. Select **Specifications>Select** from the menu or click the little green icon. Choose **US_OCE9800FULL** or **US_OCE9400FULL** (OCE9800FULL or OCE9400FULL for metric). Click OK.

Part Three: Select Print Area

Default *Print Area* **MDOT Standard** is correct by default for U.S. Customary projects. (Change this to **OCE** for metric projects.)

Part Four: Select a Display (Pentable)

Highlight *Display* from the *Specifications Controlling Plotting* area of the dialog. Select **Specifications>Select** from the menu or click the little green icon. Choose **graysurvey_wetlands** and click OK.

Part Five: Add Design Files

Select **Edit>Add Files** from the menu. Select all of the plan sheet drawings you just created (i.e. 001_Wetlands1.dgn). Click the *Add* button. Click *Done*.

Part Six: Save your Batch Print job

Select **File>Save As…** and give you Batch Print a logical name so you can print it again if the need arises (i.e. Wetland_ck_OCE9800.job).

Part Seven: Send the Plots

Click the printer icon or select **File>Print** from the *Batch Print dialog* menu to send all sheets to the plotter.

If you don't want to send them all, highlight only the files you want to plot. At this point you can send just the ones you have selected. Click OK.

ARMY CORP. DOCUMENTATION

Quick Punch List

- Cross Hatch Areas
- Measure Areas/Place Text
- Place 8 ½ x 11 Clip Boundaries
- Create Cut Sheets
- Run Border Macro
- Send to Color Plotter

CROSS HATCHING WETLANDS

Introduction

This section is intended to provide assistance with some of the tasks related to the production of plans for submittal to the Army Corp. of Engineering. There are many ways to do the same thing in MicroStation, however to create standardization and efficiency, we encourage you to follow the steps outlined below.

Step One: Start MicroStation

Double-click your MicroStation icon. Click the ***Project*** pull-down and pick on your PIN. Select **EnvPlan.dgn** from your list of files and click OK. Click your *Fit View* icon.

Step Two: Locate the Wetlands

Check and see if the information you need is displayed on your Envplan.dgn. If topo cleanup is done properly, wetland lines and flags should be displayed. If not, you can ask the Program (Urban and Arterial, Bridge or Regional) to go through the process of cleaning up the additional topo and text files or consider cleaning them up yourself.

- In the near future, there will be a separate drawing for wetlands. Cleaning up the wetlands.dgn will be the responsibility of the Environmental staff. Details of the cleanup will be in Topo Cleanup section of this manual. The wetlands.dgn will be attached to Envplan.dgn by default, however there are many old projects that will require the users to attach it manually. Use **File>Reference (DOT) Attach** and attach them to your Envplan.dgn using **Coincident World** method.

Step Three: Lock "Z" to Zero

From the *Main Menu* select **Macros>Set/Lock Z** to force MicroStation to place all elements at "0.00" elevation in the file. Click **OK** for the defaulted "0".

- This will prevent MicroStation from jumping to elements at different depths in the file.

Step Four: Set the Category Scale

Right Click on your *Settings Manager* and select **Category>Scale.** From the list of available scales, select the scale that you intend on plotting your sheets. Normally a good scale that is still legible on 8 ½ x 11 plan sheets is 1" = 50 ft. for U.S. Customary (1:500 metric).

- If you use the *Settings Manager* for almost any activity, it is required that you set the **Category Scale** first. This has to be set once in every file.

Step Five: Cross Hatching Wetlands

Part One: Select Hatching

Use the *Settings Manager* and select **Patterning>45^Hatching** for "Wetland Impacts" or use **Patterning>45/135XHatching** for "Wetlands of Special Significant Impacts". (These types coincide with the legend on the 8 ½ x 11 plan sheets.)

Part Two: Set Hatching Method

The setting in the *Hatch Area* or *Cross Hatch Area* dialog should be correct based on the *Category Scale* set in the *Settings Manager.* Adjust the *Method* to **Points** (Figure 11-10).

- Using *Points* method instead of *Flood* will place a bounding element around the area you are hatching which will allow you to label the areas all at once.

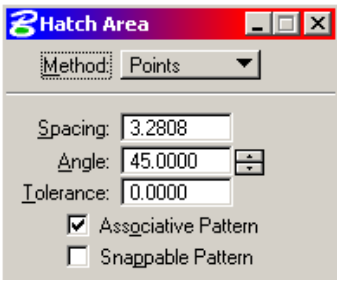


Figure 11-10: Hatch Area/Cross Hatch Area Dialog Settings

Part Three: Create Hatch Area

Using *AccuDraw* and the available snap methods, hit the intersection and the vertices of the elements that bound your area. Right click when you've hit them all to finish the command.

- If you have missed a point and need to add a vertex or want to modify and existing vertex, use the tools in the *Modify Tool Box* to accomplish this. Because we used *Associative Patterning,* the pattern will adjust itself to the new shape.

ADDING FILLED SHAPES

Step One: Set the Shade Type

Select **Patterning>Shade 20%** (or another degree of shade). By Default, the settings for this tool should be correct.

Step Two: Create the Shape

Using *AccuDraw* and the available snap methods, hit the intersection and the vertices of the elements that bound your area. Return to beginning point or hit *Close Element* to end command.

- If you have missed a point and need to add a vertex or want to modify and existing vertex, use the tools in the *Modify Tool Box* to accomplish this.

Step Three: Send Fill Back

From the *Main Menu,* select **Macros>Send Fill Back**. This will allow other line work and text to be seen in front of the shading. Hit **Refresh.**

Step Four: Reset the Fill Type

If you are finished using the Shape command, you need to tell MicroStation to stop using **Opaque** fill otherwise future areas or hatching that you do will be filled solid. To do this, select **Qualities>Change>Fill** from the *Main Menu*.

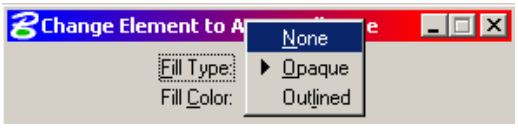


Figure 11-11: Change Fill Type to None

In the dialog (Figure 11-11), change *Fill Type* to **None.**

MEASURING AREAS AND PLACING TEXT

Step One: Lock "Z" to Zero

From the *Main Menu* select **Macros>Set/Lock Z** to force MicroStation to place all elements at "0.00" elevation in the file. Click **OK** for the defaulted "0".

- This will prevent MicroStation from jumping to elements at different depths in the file.

Step Two: Set the Category Scale

Right Click on your *Settings Manager* and select **Category>Scale.** From the list of available scales, select the scale that you intend on plotting your sheets. Normally a good scale that is still legible on 8 ½ x 11 plan sheets is 1" = 50 ft. for U.S. Customary (1:500 metric).

- If you use the *Settings Manager* for almost any activity, it is required that you set the **Category Scale** first. This has to be set once in every file.

Step Three: Set the Text Attributes

Using the *Settings Manager,* select **Prop. Text and Dims>Text Note.** This will set your text to the correct height, width, color, level, style and weight.

Step Four: Open Measure Area Tools

Select **Measure>Area Tools** from the *Main Menu.* A new set of tools should open.

In the rightmost tool in the *Tool Box* (Figure 11-12), set some *Parameter Settings*.

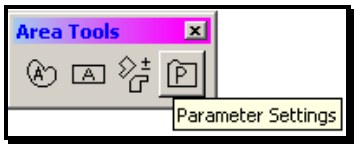


Figure 11-12: Area Parameter Settings

Part One: Set the Default Text Font

While in the **Text** tab, set the **Font** to **123 dotitalics** (Figure 11-13). This is the only setting necessary on the tab.

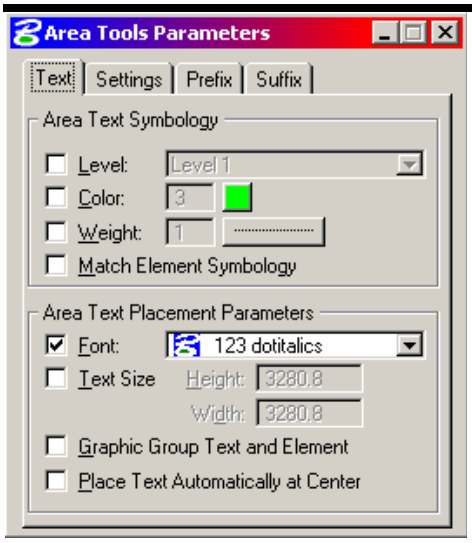


Figure 11-13: Adjust Text Font to 123 dotitalics

Part Two: Set the Default Prefix

Click on the *Prefix* tab (Figure 11-14). Add a prefix that you would like to use. (i.e. Wetlands =). You're limited to ten characters.

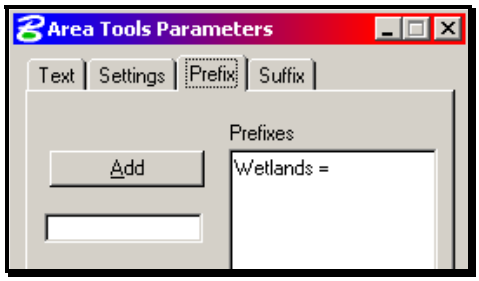


Figure 11-14: Add a prefix

Part Three: Set the Default Suffix

Click on the *Suffix* tab (Figure 11-15). Add a suffix that you would like to use. (i.e. s.f. or m\178 for metric). You're limited to ten characters.

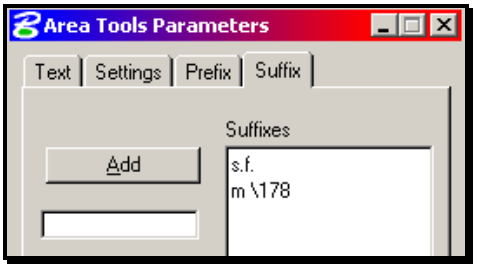


Figure 11-15: Add Suffixes

Step Five: Select by Attributes

You can select all of your hatched areas, measure and label them all at once with one click to the screen.

Select **Edit>Select By Attributes** from the *Main Menu.* Select **Tools>Set Select By from Element** in the *Select by Element* dialog box. Click on one of the hatched areas. Click again to *Accept.* Now hit **Execute.** This should highlight all of the hatched areas.

- If you want to measure and label shaded area, you will have to select one of those areas and hit execute to select them all.

Step Six: Select Measure Area Tool

From the *Area Tools* toolbox (Figure 11-16), select *Measure Area.*

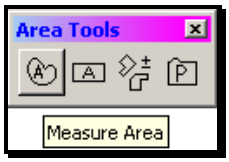


Figure 11-16: Measure Area Tool

Configure area tool for the method, prefix and suffix. Select **Element** from the *Method* pull down and place a check in the *Prefix* and *Suffix* boxes and select the corresponding pull down and pick one of your preset options. **Click** in your view to *Accept* the command.

This should label all of your areas. The orientation of the text will be horizontal to your current view window which means you will have to rotate and possibly move text. Use the **Rotate Element** tool and set method to either **2 points** or **3 points.** Follow the prompts.

ⓘ ***If you cannot see the text for your areas, check that you have done all the steps in this section.***

Step Seven: Select None

Select **Edit>Select None** to unselect your hatching. Close the **Select by Attributes** dialog and click **Cancel** to tell MicroStation to stop filtering by the hatched attributes.

Step Eight: Edit the Text (Optional)

You can use the *Edit Text* tool to add additional verbiage to your area text. While the text is in your *Text Editor* window, you can click on another type of text placement such as *Place Note* (Figure 11-17). This will allow you to point with an arrow to small areas that cannot be labeled clearly.

- You may have to select a dimension placement from your *Settings Manager* first in order for the arrowhead to be filled in.

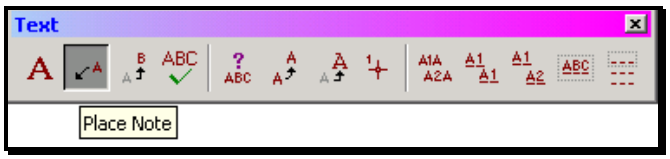


Figure 11-17: Place Note tool

Consider changing the default setting of the tool and selecting **Box** as a *Text Frame* (Figure 11-18). This will make your text stand out and if masking is required, it will make it easy to place a fence around your text.

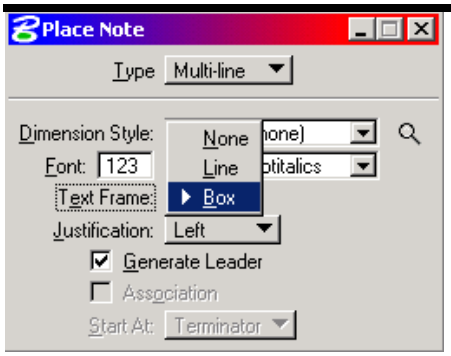


Figure 11-18: Using a Box text Frame

Place the text and delete the old text.

Step Nine: Masking References (Optional)

If the text you placed is obscured by reference files, place a fence around your text and select **File>Reference (DOT)>Clip>Mask>All** if you want to mask all elements in all references or **File>Reference (DOT)>Clip>Mask>Single** and click on the specific reference file you want to mask. Click on the view to *Accept.*

Or, you can also open your reference file dialog and highlight the specific reference file(s) you want to mask and select **Tool>Clip Mask.**

CREATING 8 ½ X 11 CUT SHEETS

Step One: Set Category Scale

Right click on the *Settings Manager* and select **Category>Scale.** Select the scale you want to use for your cut sheets. 1 in. = 50 ft. (1:500 metric) is a good scale to use. This scale will still allow the stationing and existing text to be legible. This should be the same scale you used to place your text for the areas.

Step Two: Place 8 ½ x 11 Clip Boundaries

Select **Create Plan Sheets> Place Clip Boundary 8.5x11** from the *Main Menu.* You will have a rectangle on your cursor waiting for placement. You are holding the portrait page by the bottom edge of an 8 ½ x 11 piece of paper. With your first click, place the boundary along the centerline and move your cursor up-station to rotate the page. Click again to define the amount of rotation. Continue placing boundaries for the length of your project.

- You can stop at any time (by right clicking) and move and/or rotate your boundaries. Restart the placement if necessary.

ⓘ ***You must keep the boundaries in order! This will determine the creation order of the cut sheets.***

✓ *Refer to page 5-3 for the procedure on placing clip boundaries manually.*

Step Three: Create the Cut Sheets

Part One: Activate Macro

From the *Settings Manager* select **Create Plan Sheets > Create 8.5x11 Cut Sheets**.

Part Two: Supply Starting Number

The macro asks you what number you want to use for the starting number of the cut plan sheets. Use the default “1” (Figure 11-19). This will appear in your border as your sheet number (consider using “2” if you plan on including a Title Sheet, “3” if you plan on having a *Layout* sheet).

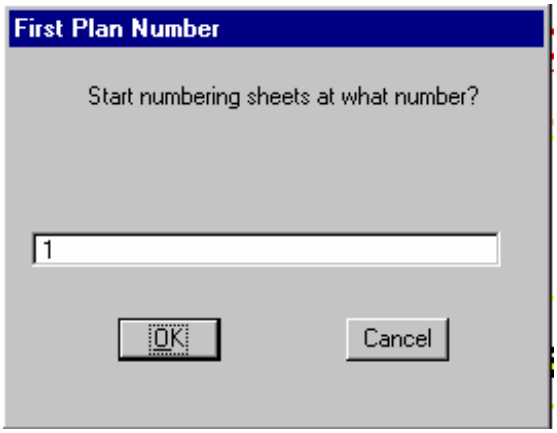


Figure 11-19: Start Numbering At?

Part Three: Sit back and watch

When the program has finished, it will drop you back into Envplan.dgn. Open up the files you've just created and see how they look!

Step Four: Troubleshooting

If you open a plan sheet drawing and the graphics within the sheet are not correct, it could mean that one the drawings that is referenced in is not at the same Global Origin as the other drawings. If the graphics aren't aligned with your border, try and re-cut the sheets again. It won't be necessary to place new boundaries. Normally this will fix the problem. See CADD Support for assistance if needed.

Step Five: Run the Border Information macro

The Border contains variables that can be replaced by a macro. It is not necessary to edit anything on this drawing that contains a $ or @ (i.e. $TOWNORCITY$). Select **Macros>Border Information** to run the macro. Process all of your sheets.

- ✓ *Please refer to PCF Editing on page 1-25 if the variables do not get filled in with the proper information.*

CREATE A TITLE SHEET

Step One: Create a Title Sheet

Using **File>Make Sheetz,** create a title sheet.

✓ *Refer to page 4-3 for more informtaiton on creating a title sheet.*

Step Two: Create a Location Map

Select **File>Open Location Map,** select **Macro>Location Map** and place the square defining the project area.

✓ *Refer to page 4-4 for more information on creating a Location Map.*

Step Three: Paste Map

Open the *001_Title.dgn* and select **Edit>Paste.** Adjust the scale to **0.00000789** and place the map into the square provided by *snapping* to the corner.

✓ *Refer to page 4-5 for more information on pasting a location map into your title sheet drawing.*

CREATE A LAYOUT DRAWING

Step One: Open EnvPlan

Open the drawing that contains your *Cut Sheets (i.e. EnvPlan.dgn).*

Step Two: Create Saved View

Create a *Saved View* called **Layout.**

✓ *Refer to page 4-6 for more information on creating a saved view.*

Step Three: Create 002_Layout Drawing

Using **File>Make Sheetz,** create a numbered drawing called **Layout.**

✓ *Refer to page 1-18 for more information on creating drawings.*

Step Four: Attach Saved View

Select **File>Reference (DOT)>Attach** and attach the drawing that contains your saved view. Set the scale based on the number of clipe boundaries in combination with the scale in which you placed them. In this example, 10 (clip boundaries) x 600 (scale of the clips) = 6000 (scale of the reference attachment). Set the *Nesting* to **Copy Attachment 1.**

✓ *Refer to page 4-8 for more information on attaching, scaling and rotating your saved view.*

Step Five: Adjust Level Display (if necessary)

Users may want to limit the levels that are displayed and drawings displayed to better represent the layout drawing.

BATCH PRINTING 8 ½ X 11 CUT SHEETS

Step One: Open Batch Print Dialog

Select **File>Batch Print/Plot (DOT)** from the dialog Menu. Click Cancel at the *Open job Set* dialog window.

Step Two: Select a Printer

Highlight *Printer* from the *Specifications Controlling Plotting* area of the dialog (Figure 11-20). Select **Specifications>Select** from the menu or click the little green icon. Choose **Standard Details**. Click OK.

Step Three: Select Print Area

Highlight *Print Area* from the *Specifications Controlling Plotting* area of the dialog (Figure 11-20). Select **Specifications>Select** from the menu or click the little green icon. Change the default *Print Area* to **Standard Details** and click OK**.**

Step Four: Select a Display (Pentable)

Highlight *Display* from the *Specifications Controlling Plotting* area of the dialog (Figure 11-20). Select **Specifications>Select** from the menu or click the little green icon. Choose **Standard Details** and click OK.

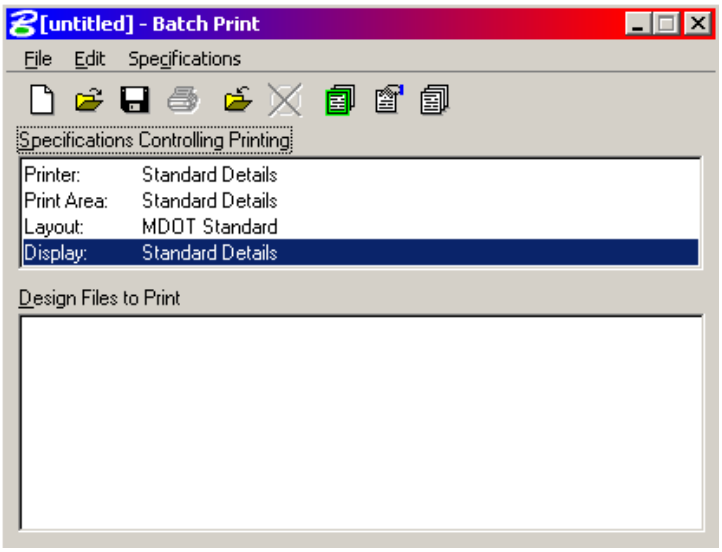


Figure 11-20: Batch Print Setup

Step Five: Add Design Files

Select **Edit>Add Files** from the menu. Select all of the plan sheet drawings you just created (i.e. 001_EnvPlan1.dgn). Click the *Add* button. Click *Done*.

Step Six: Save your Batch Print job

Select **File>Save As…** and give you Batch Print a logical name so you can print it again if the need arises (i.e. EnvPlan_ArmyCorp_printer.job).

Step Seven: Send the Plots

Click the printer icon or select **File>Print** from the *Batch Print dialog* menu to send all sheets to the plotter.

If you don't want to send them all, highlight only the files you want to plot. At this point you can send just the ones you have selected. Click OK.

- This printer setting will send your plots to your default Windows printer.

After you click OK, you can pick which Windows printer to use by selecting *Set Up System Printer* from the *Print Batch* dialog (Figure 11-21).

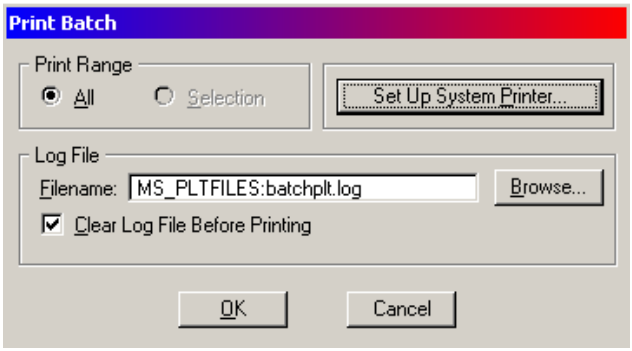


Figure 11-21: Select Set Up System Printer

Select one of your system printers from your list of available printers. Consider using a black and white photocopier. Click OK.

Chapter 12 Regional Workflow

REGIONAL .UCF (USER CONFIGURATION FILE)

ADJUSTING EXISTING USERS TO REGIONAL PREFERENCES

Overview

Each MicroStation user has their own *User Configuration File (UCF)* called **normal.ucf,** which identifies the location where MicroStation will open a file whether on the network (y:\PIN) or a user's local hard drive (d:\PIN). MaineDOT has some Regional Offices with poor network connection speed and Surveyors that are working unplugged from the network. These users will **primarily** work on a local copy of the network project. Ocasionally they will need to work on files on the network. The following steps are intended for these Region Employees who will be **primarily** working locally.

The **normal.ucf** also identifies which workgroup folder the user will be working in (i.e. Highway, Bridge, Survey, ROW, etc.).

Step One: Copy New ".UCF Files"

Using Windows Explorer, browse to the **y:\msworksp\!msv8user\!Template_Regional\MSTAUSER\config\users** folder. Copy the **normal.ucf** and **network.ucf** files into your user folder on your local C: drive (i.e. C:\!msv8user\Your.Name\MSTAUSER\config\users). Overwrite any existing files.

Step Two: Adjust the Workgroup (If necessary)

Part One: Editing ".UCF" Files

Using Windows Explorer, browse to the **c:\!msv8user\Your.Name\MSTAUSER\config\users** folder. Double click the *normal.ucf* and/or *network.ucf* file to open it. If the ".ucf" file is not opened directly, Windows may not recognize this file extension (Figure 12-1). Pick **Select the program from a list** and click **OK.**

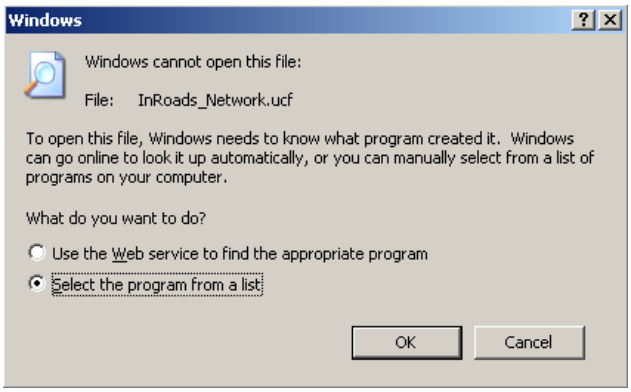


Figure 12-1 Associate the file type to open with Notepad

A new dialog will open (Figure 12-2) asking you to choose a program. Scroll down in the list and select **Notepad.** Place a checkmark in the box to **Always use the selected program to open this kind of file.** Click **OK.**

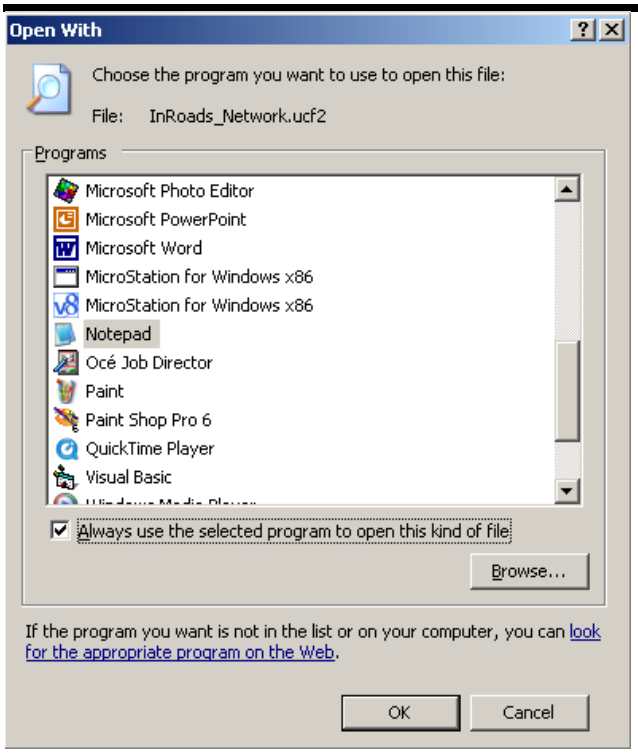


Figure 12-2 Select Notepad as the preferred program to open this file.

Part Two: Change Workgroup

Locate the line in the files that says "WKGROUP =". Copy and paste from the list of valid groups to overwrite the current workgroup (i.e. HIGHWAY).This must be all **CAPITOL** letters and have a space between the "=" and the value as in the examples provided in the file (Figure 12-3). This is the only change you should make in this file. Save this file and exit Notepad.

```
#----- Set up disk variables to match user's mapping -----#
PROJDISK1 = Y:

#-------------- Assign user's work group --------------------#
#-- Valid Groups are BRIDGE,BRMAINT,CONST,ENVIRON,GEOTECH, --#
#-- HEARING,HIGHWAY,ROW,SURVEY,TRAFFIC,UTILITIES ------------#
WKGROUP = HIGHWAY
```

Figure 12-3: User Configuration File

Step Three: Working Locally or On the Network

Working locally (D: drive) is now your workflow by default. It utilizes your **normal.ucf** (user configuration file) that points to your **PIN** briefcase for projects.

Working Locally

Entering MicroStation will be the same as usual, by clicking the MicroStation icon on your Desktop opening the *MicroStation Manager* window (Figure 12-4).

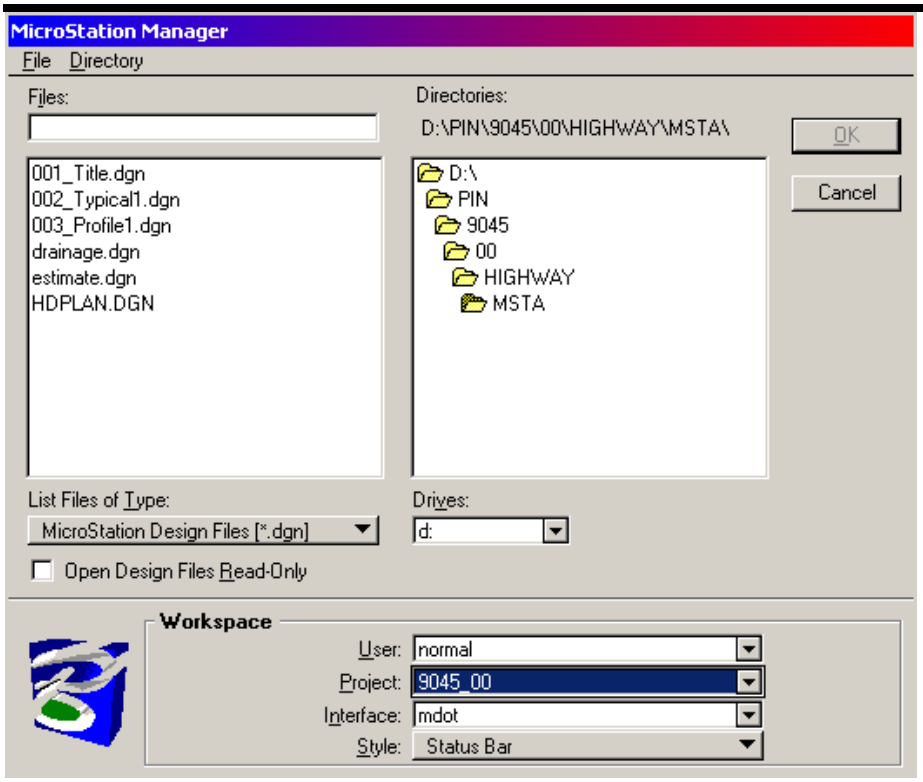


Figure 12-4: MicroStation Manager

In the **Workspace** area of the dialog, it should look like the dialog above.

The **User** field always defaults back to "normal". Normal, for Regional users will point to their local **PIN** briefcase for projects.

Working on the Network

Occasionally you may want to open files on the network to check something. Simply switch your user file to **Network** (Figure 12-5)**.**

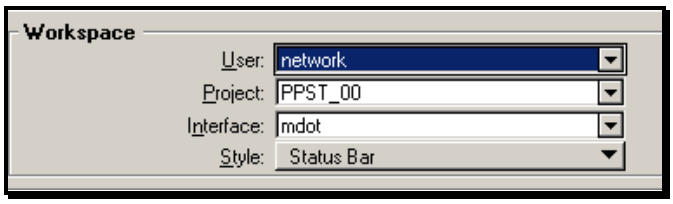


Figure 12-5: User: Network

Pick your project from the "Project" pull down. This should open that project on the network (y:) drive.

USING WINDOWS BRIEFCASE

CREATE A BRIEFCASE

Overview

The *Windows Briefcase* software provides a method of comparing project files on the network with project files copied locally. A briefcase is simply a folder with intelligence. In the event a file is modified, added to a project, or deleted from a project, it is possible to know when and possibly by whom.

- Sometimes *Windows* thinks that you have a file open if the *Explorer* window has a folder open in the *Briefcase*. To avoid this, simply close the *Explorer* window or click on another folder. Figure 12-6 is a typical message you will see if you are accessing the briefcase through *Windows Explorer*.

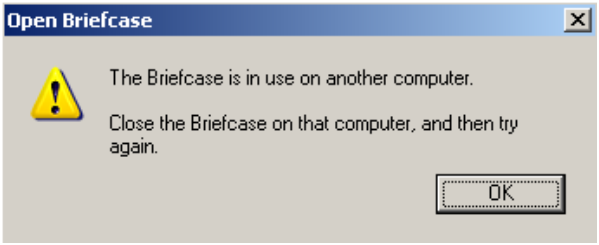


Figure 12-6: Open Briefcase

Step One: Create D:\PIN folder

Open *Windows Explorer* and browse to your D drive. Verify that you have a folder named PIN at the root of the D drive. If it does not exist, create one (Right click and select **New>Folder**).

Step Two: Create a Briefcase

Click on your D:\PIN folder on the left side of the *Explorer* window. **Right click** on the right side of Explorer (anywhere except on a file or folder) and select **New>Briefcase** (Figure 12-7).

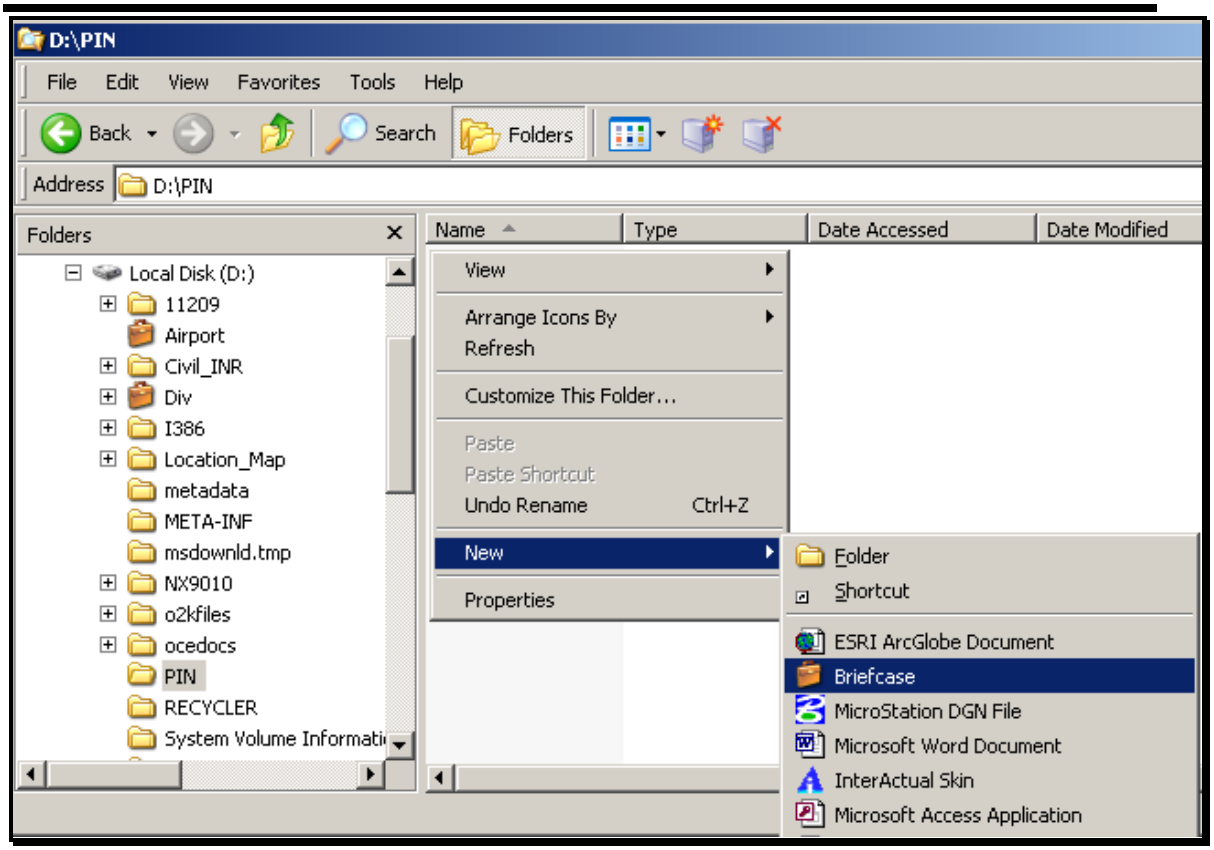


Figure 12-7: Creating New Briefcase

Step Three: Rename the Briefcase

Right click on the Briefcase and select **Rename**. Type the PIN number of the project you want to work on locally and hit enter (i.e.12745). It's crucial to stick with the same name as it appears on the y: drive.

Step Four: Open the Briefcase

Double click on the briefcase.

- The first time you open the briefcase, the Briefcase Wizard will open giving you brief instructions. Click Finish.

ADDING PROJECTS TO YOUR BRIEFCASE (ALL FILE TYPES)

Overview

One way to add files to your briefcase is to add all file types. This will make a full copy of all files in the project directory. This is the easiest way of creating a synchronized copy in your briefcase. You can also create the briefcase based on individual file types which is described later on page 12-14.

Step One: Adding Network Files To Your Briefcase

Browse *Windows Explorer* to the **Y:\PIN** directory and navigate to your PINs folder. Select your project's decimal folder. Select **Edit>Copy To Folder…** from the *Windows Explorer* menu (Figure 12-8).

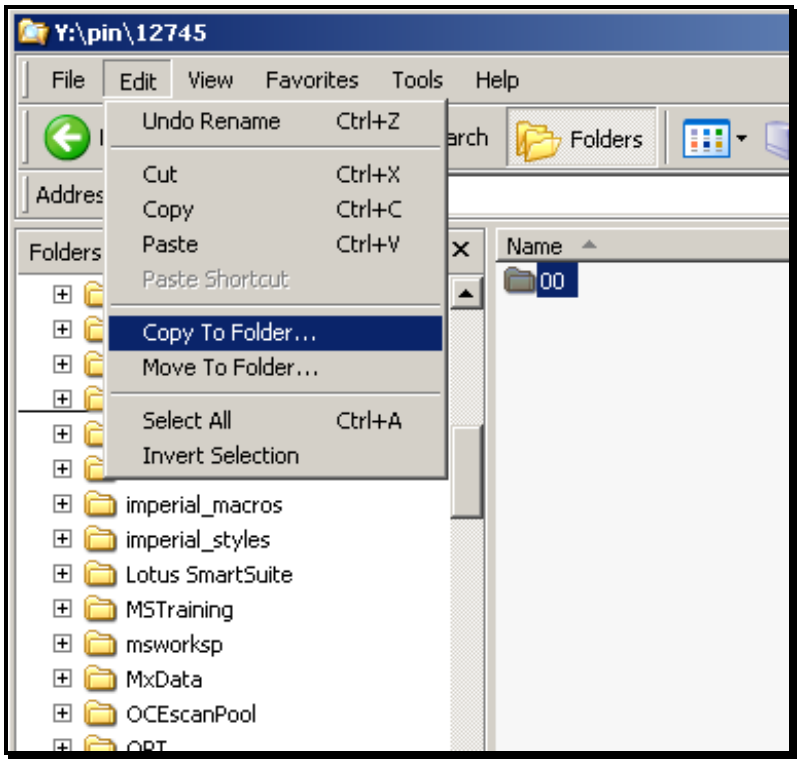


Figure 12-8: Select Copy To Folder…

In the *Copy Items* dialog, navigate to the briefcase you just created on your D: drive (i.e. D\PIN\12745) Figure 12-9. Select **Copy.**

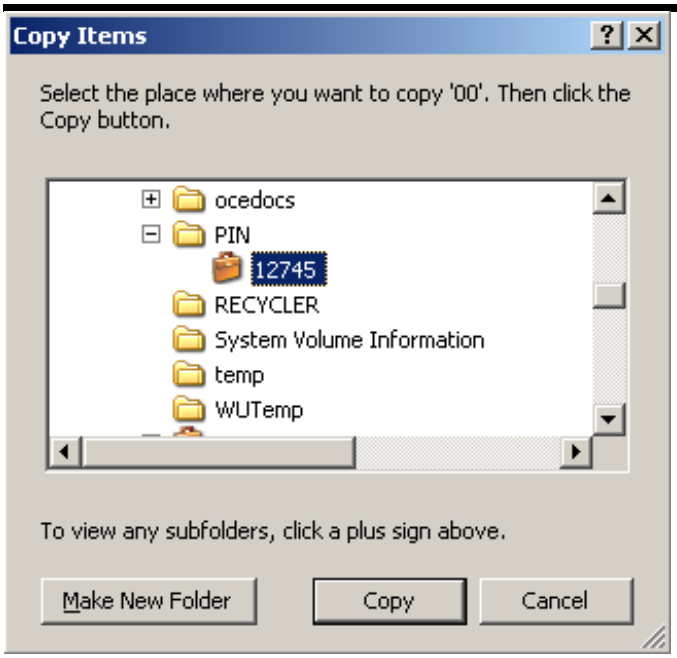


Figure 12-9: Navigate to your PINs briefcase on your D: drive.

You will begin *Updating Briefcase* evident by the dialog (Figure 12-10) and the progress bar. When the process is complete, the dialog will disappear.

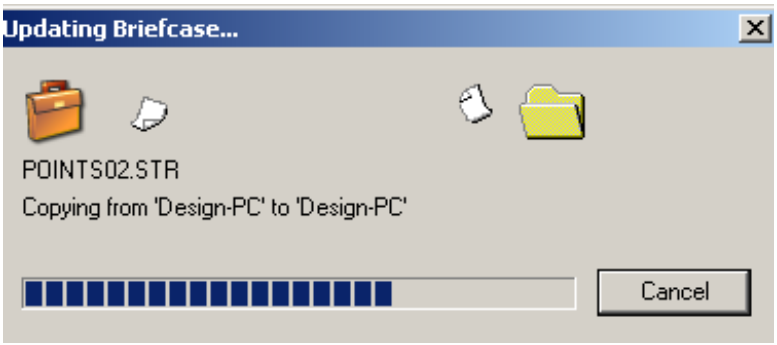


Figure 12-10: Updating Briefcase dialog while processing.

- The time it takes to process depends on your network connection and the speed of your computer. The initial synchronization will take longer than updates that you will do in the future.

ⓘ ***When there is a database (.mdb) on the network, you may get a few warnings along the way. The warnings are intended for reasons described below.***

Step Two: Synchronizing Databases

Synchronize Your Databases (Read/Write Permissions)

If the briefcase encounters a database that you have permissions to edit, you will be prompted with a few warning dialogs.

First Warning: Creating a Replica

The briefcase will handle synchronizing a database and will create a copy locally (Figure 12-11). If you intend on working on this database offline, select **Yes.** If not, select *No* and refer to page 12-12 for instructions on manually updating the briefcase.

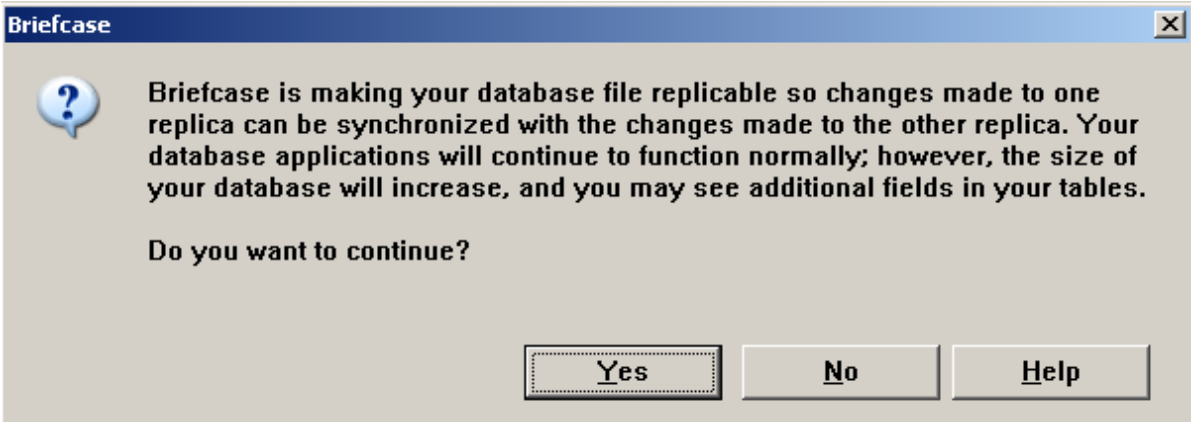


Figure 12-11: Creating a replica of the database locally.

Second Warning: Creating a Backup

The briefcase will now recommend creating a backup of the original database on the network as it prepares it to be the Design Master (Figure 12-12). Only one of the databases will be able to modify and save the design of the database (add additional fields, formatting, change Queries, etc.). This is referred to as a Design Master.

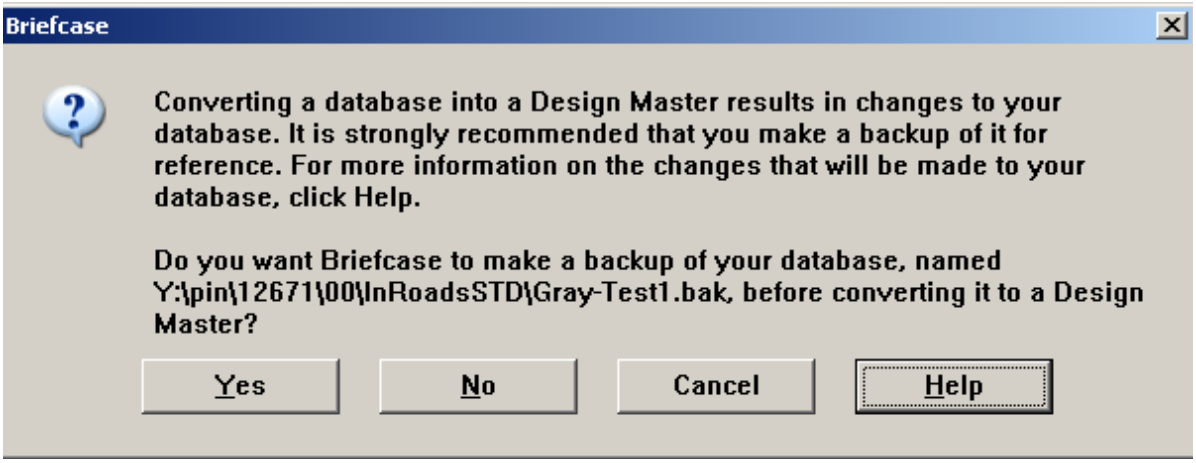


Figure 12-12: Creating a backup of the database.

Third Warning: Pick the Design Master

Select the copy of the database that you want to be the Design Master (Figure 12-13). If most of the changes to the design of the database are going to be done locally, select the *Briefcase Copy*. Otherwise, select the *Original Copy*.

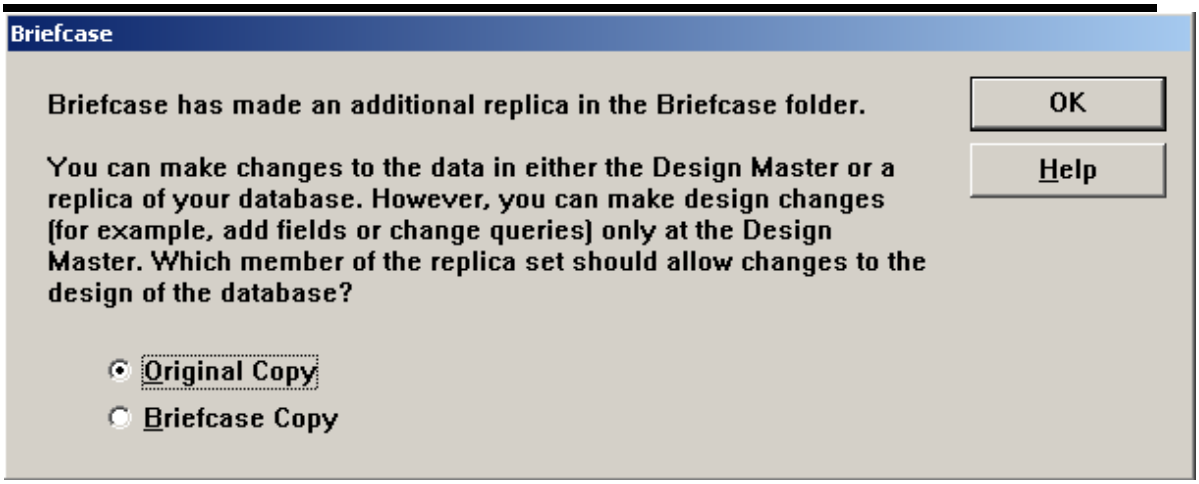


Figure 12-13: Select which database has the ability to make design changes.

Synchronizing Others Databases (No Permissions)

If the briefcase encounters a database that you do not have permissions to edit, a single dialog will open (Figure 12-14) stating that it may be already open by someone else or that you do not have permissions to edit it. In this case, the only option is to click **OK.** Refer to page 12-12 for instructions on manually updating the briefcase.

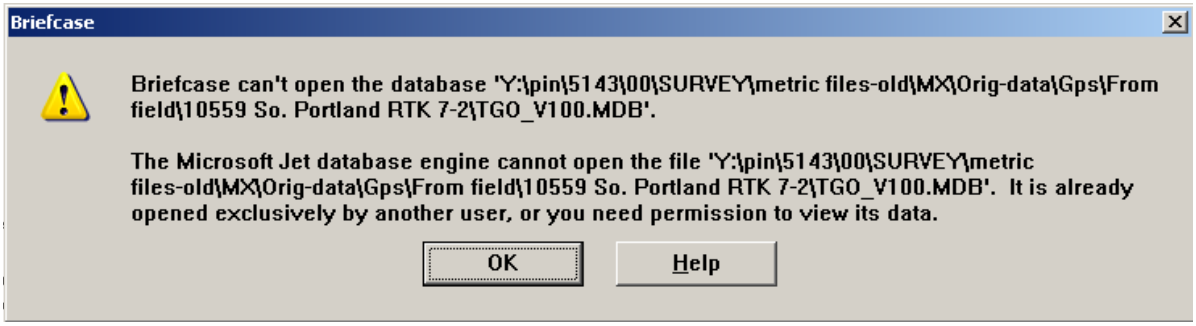


Figure 12-14: Briefcase can't open the database - No permissions.

Step Three: Remove Database(s) from Synchronize List

If you told the briefcase not to create a replica or permissions prevented you from having access to the database, you will have to finish the original synchronization manually. Now you will have the opportunity to skip those databases from being updated in your briefcase.

Manually Update the Decimal Folder

In *Windows Explorer* select your PINs decimal folder. Select **Briefcase>Update All** from the *Windows Explorer* menu. In the *Update* dialog (Figure 12-15), scroll and locate any databases (.mdb) that you do not want to synchronize. The left portion of the dialog is your briefcase location and the rightmost portion is the network file. **Right-click** near the arrow and "Create" text in the center of the dialog between the database and the network location. Select **Skip** from the list. Repeat as necessary. When finished, click **Update.**

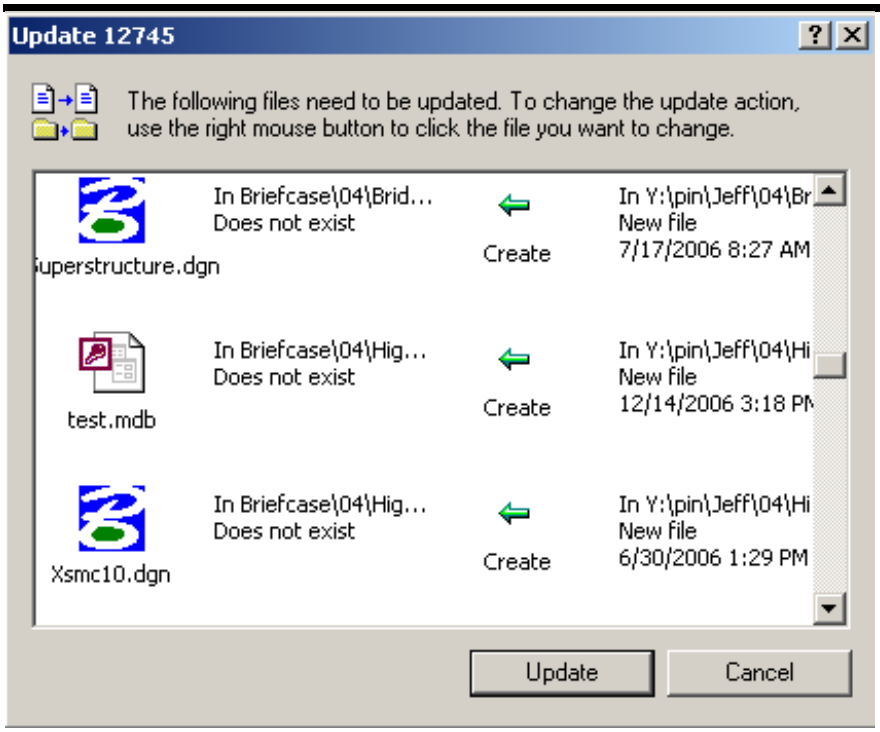


Figure 12-15: Update project dialog waiting for input.

ADDING PROJECTS TO YOUR BRIEFCASE (BY FILE TYPES)

Overview

The second way of making a synchronized copy in your briefcase allows the user to select specific file types. In this case, the user will have to manually select up to 20 different file types. Experiment with both methods and select the method that you prefer.

Step One: Adding Network Files To Your Briefcase

Browse *Windows Explorer* to the **Y:\PIN** directory and expand the list of PINs by clicking the plus sign on the left panel of the *Explorer* window. Click on your PIN (Figure 12-16).

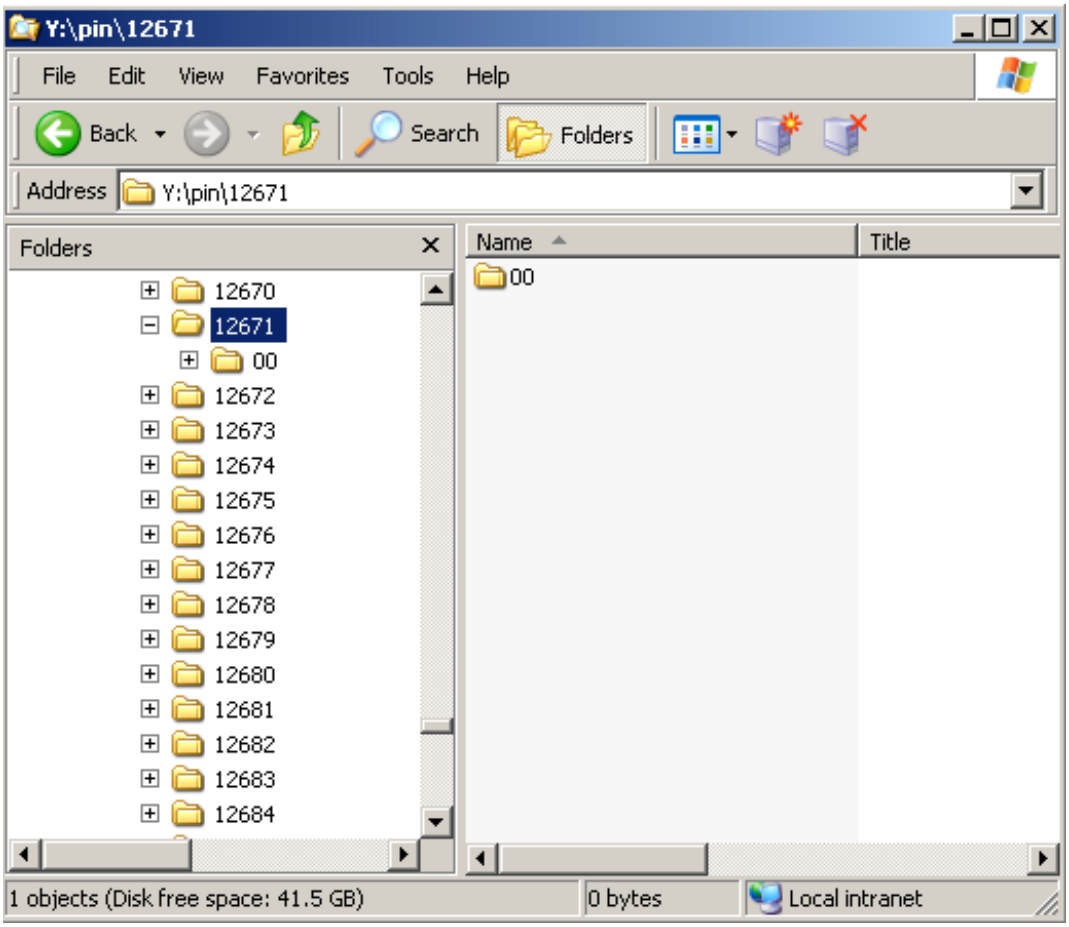


Figure 12-16: Browsing your PIN

Use the scroll bar to display the D:\PIN\## on the left panel of the *Explorer* window. **Right click+hold+drag** the decimal folder of your project number into your **D:\PIN\##** Briefcase. Release your mouse button and select **Make Sync Copy of Type…**(Figure 12-17).

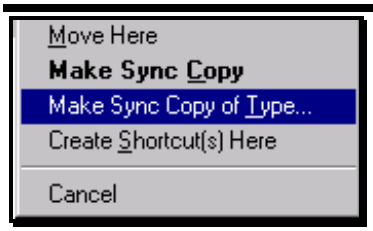


Figure 12-17: Make Sync Copy of Type

Step Two: Select the File Types

From the *Add # to the Briefcase* dialog (Figure 12-18), select **.csv, .dat, .dgn, .doc, .dwg, .dxf, .log, .pdf, .plt, .prj, .prn, .txt, .xml, .zip (**and any other **MX** file types) as your file types (it is not necessary to hold CTRL key). Verify that the "*Include subfolders of the folder #*" is checked. Click **OK.**

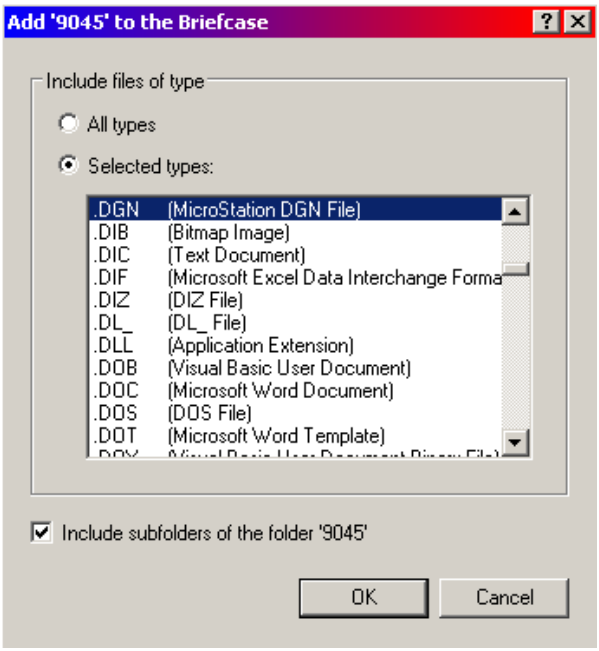


Figure 12-18: Select File Types

- As different files of other types are created or added to the local directory or network directory, the briefcase will recognize them; however, inclusion of the new file types on the network has to be initiated by the user.

SYNCHRONIZE YOUR BRIEFCASE

Update Briefcase and Network

Overview

As you work on your project on your local hard drive, any files that you make changes to will be tracked in your briefcase. Likewise, if files are changed on the network, your briefcase will identify them. Synchronizing the briefcase with the network will allow the user to select which files to update and perform the updating. Users should synchronize their briefcase with the network weekly. The network is backed up nightly and is meant to store the master copy of all project files.

Step One: Open Your Briefcase

Open *Windows Explorer*. Make sure that *Explorer* is displaying all details (**View>Details).** Click on your project's Briefcase on the left side of the *Explorer* window to display the contents on the right.

Step Two: Update All Files (Recommended)

From *Windows Explorer's* main menu, select **Briefcase>Update All.** The briefcase will compare the files in on your hard drive with the network copies and display the results (Figure 12-19).

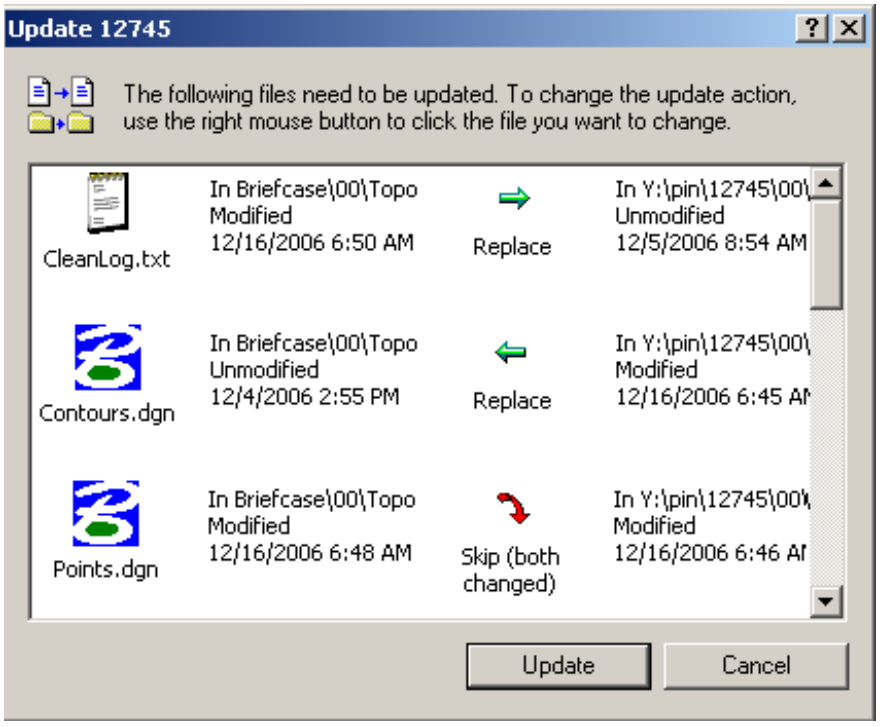


Figure 12-19: Update dialog with default action.

The left column displays the file name in question, the next column displays the briefcase files information, the next column displays the default action to take in order to update both

locations and the right column displays its counterpart's information on the Y: drive.

The default action can be adjusted at any time by right clicking the file and selecting a new action to be preformed to the file. Below is a breakdown of the actions.

Replace Option

When a file has been modified in one or the other location, the briefcase prompts you to replace the unmodified file. This is most likely what you want to do.

However, there may be an instance when the file you were working on was corrupted or changes performed are unwanted, you could get a new copy by replacing the file in your briefcase. If you right click the file, you get these possible alternatives (Figure 12-20). Notice that you also have the option of skipping the update.

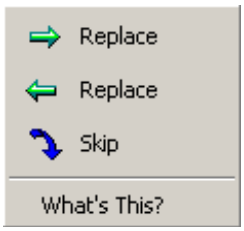


Figure 12-20: Update Options

Skip (both changed) Option

When the file in the briefcase and the file on the network have both been modified, the briefcase prompts you to "skip" updating the file. This is when **communication** will need to take place. Open *Windows Explorer* and browse to the Y: drive and locate your PIN. Open the folders to the location of the common file (i.e. Y:\pin\ 12745\00\Highway\MSTA). Open the **dgnuse.log** file. This file keeps a record of who has opened the files on the network and possibly made changes. Look for an entry in the log for the file in question. The log provides you with the time, date and name of the person who had opened the file (Figure 12-21).

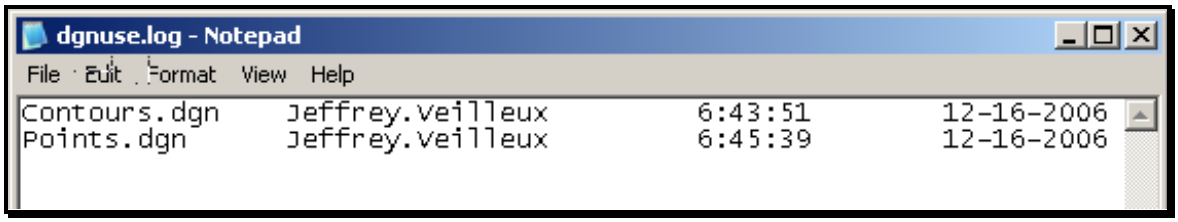


Figure 12-21: The dgnuse.log file provides valuable information.

Find out from this person if any work was done to the file. Once it is determined which file takes precedence, you can **Right Click** the file and change which direction that the file will be copied (Figure 12-22).

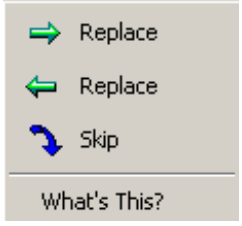


Figure 12-22: Options when both files have been modified.

If it is undetermined which file should be preserved, select **skip** until the files can be compared with one another.

- The "dgnuse.log" can be misleading. The dgnuse.log on the network tells you who opened the file on the Y: drive only, it doesn't tell you if this person has made changes to the file. If a person uses the preference "Immediately Save Design Changes" this will change the modified date regardless if changes are made. When a person synchronizes their briefcase, a dgnuse-local.log gets copied to the network, giving a record of who is adding files from a briefcase.

Delete Option (File Removed)

The **Delete** option lets you know when a file was deleted in either of the two locations. If a file is no longer needed and is deleted, the briefcase gives you the opportunity to make both locations identical (Figure 12-23).

Figure 12-23: Options when a file(s) has been deleted.

If you Right Click on the file, you get these possible alternative actions (Figure 12-23). The briefcase gives you the opportunity to delete the file, create (copy) the file again in the location it was deleted from or simply don't delete the file. The dgnuse.log won't help you to find out who deleted this file, however it may tell you who has been working on this project on the network, and that itself may open the lines of communication.

Create Option

If a new file was created in either location, the briefcase will give you the option to create the file in the other location (Figure 12-24).

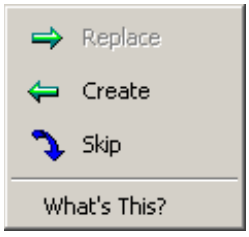


Figure 12-24: Create options.

It is common that other users may be adding files on the network as well as in you in your briefcase. Survey, for example, may have additional topography that you need locally. The default action (create) is the normally the one you want. You can right click the file for alternative actions. The only other action for create is "skip".

Renaming Files in Your Local Briefcase

It is recommended that all file renaming (i.e. Sheet Renumbering Utility) be done locally in your briefcase. The intelligence of your briefcase allows you to take the renamed files and create them on the network and at the same time it will also delete the files that were associated to these files from the network. This allows for no confusion or duplication of files on the network with different names.

ADDING ADDITIONAL FILE TYPES TO BE SYNCHRONIZED

This section describes how to add additional file types to a briefcase that has already been setup. This will allow any "orphan" files of the new type to be synchronized with the network. As you work on a project, additional files may be created. General Notes (.doc) files, Construction Notes (.xls) files, Estimator (.csv) files, MicroStation Packager files (.pzip), Images (.tif, .bmp or .jpg) and MicroStation Backup (.bak) files are some additional types that may be created when doing a complete plan set. These file types can be added when creating a briefcase or added later. Follow the steps below to add the new types (Figure 12-25).

Step One: Right Click Your Project at the decimal folder

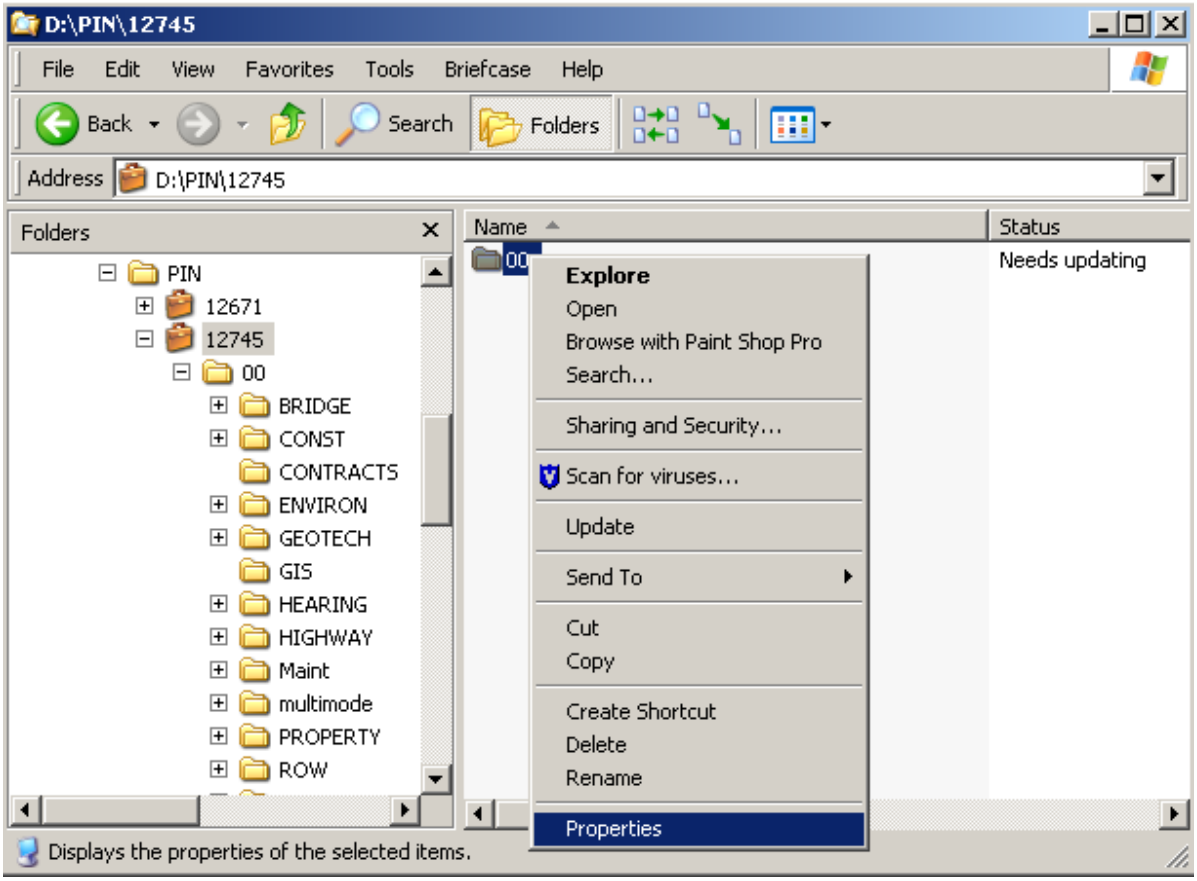


Figure 12-25: Changing Properties

Step Two: Select the Update Info Tab

Select the *Update Info* tab (Figure 12-26) and select the new file types you wish to be synchronized with the network files.

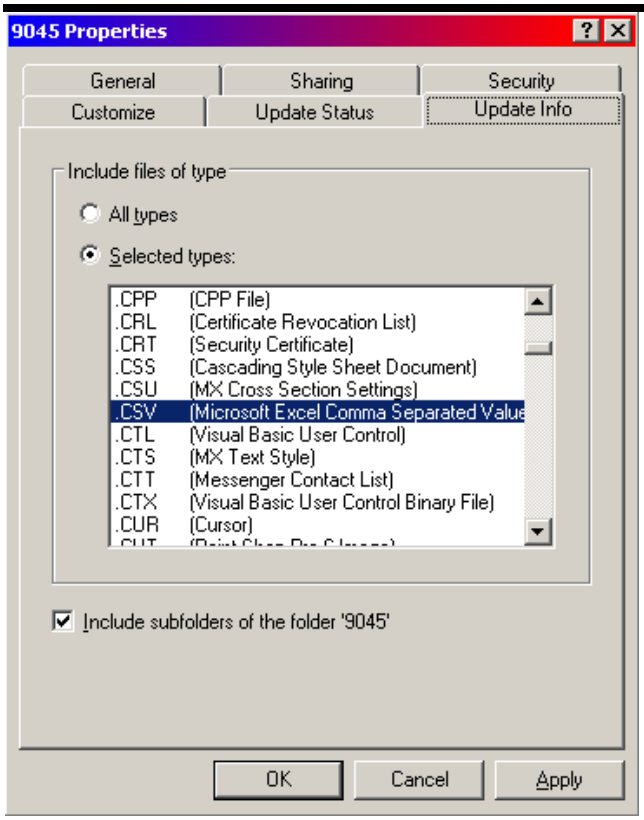


Figure 12-26: Update Info

Select the new file types (it is not necessary to hold CTRL key). Verify that the "Include subfolders of the folder 'PIN'" is checked. Click **OK** when done.

- This process will only work if you are connected to the network location that your briefcase is synchronized with.

Step Three: Synchronize Your Briefcase

It will be necessary to re-synchronize the briefcase for the new files to be copied to the network. This will prompt you to *Create* the new files on the network. This is the default action you want to take. There may be files of this type on the network that will be copied down to your briefcase also. If you want a copy of them, the default action is OK, but if you don't need them, you can *Skip* them by right clicking the file and changing the default action to SKIP.

REMOVING A PROJECT FROM THE BRIEFCASE

Once final plans have been delivered to the Contracts for printing, you can remove it from your briefcase. Prior to removing it, do one last synchronization on the PIN and manually copy any "orphan" files to the network. Orphan files are additional file types that reside only in your briefcase.

- If you added additional file types or created the briefcase with all file types, there may not be any orphan files.

Step One: Open Briefcase and browse to the MSTA folder

Step Two: Sort by File Status and copy to Clipboard

Click on the Status heading in Windows Explorer to group the like files together. Highlight the orphan files (Figure 12-27) and select **Edit>Copy.**

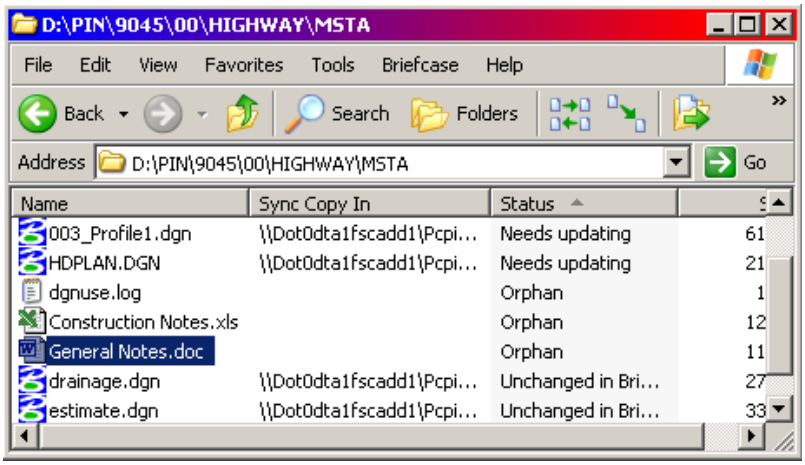


Figure 12-27: Adding Orphan Files

Step Three: Paste files into the appropriate folder on the Y: drive

Open your *Explorer* to the Y: drive and browse to the folder that contains the project files (i.e. Y:\PIN\9045\00\Highway\MSTA). Select **Edit>Paste** to copy them to this location.

Step Four: Delete the Project

After all project files have been synchronized and orphan files copied to the network, you can highlight your briefcase and select **File>Delete** to delete the PIN and free up space on your hard drive.

Chapter 13 Consultant CADD Coordination

CONSULTANT CADD COORDINATION

DETERMINE THE CONSULTANTS DUTIES (PROJECT BY PROJECT BASIS)

What is their responsibility?

Consultant Doing Survey

Aerial Photogrammetric Mapping - Consultants will coordinate through Brian Casey. They submit their information back to Brian and no information is necessary from the Consultant Coordinator.

Traditional Surveying - Consultants will coordinate through the Area Survey supervisors to get specifications. They submit their information back to the Area Survey supervisors and no coordination is necessary.

Consultant Doing ROW

Existing ROW - Consultants will coordinate through the Real Estate Manager in the Programs. They will require CADD drawings of existing topography and text.

Proposed ROW - Consultants will coordinate through the Real Estate Manager in the Programs. If they are doing the proposed ROW, chances are they are doing existing also. They will require CADD drawings of existing topography, text, existing ROW (if necessary), alignment, design (highway.dgn or bridge.dgn) and cross sections.

Consultant Doing Design

Bridge Projects - Consultants will coordinate through the Consultant Coordinators in the Program. They will require CADD drawings (both 2D and 3D) of existing topography, text, contours, points, triangles and existing ROW. The agreement may or may not require the consultants to “clean-up” topo and text drawings. For all new projects, consultants will follow the current General Contract Agreement.

Highway Projects - Consultants will coordinate through the Consultant Coordinators in the Program. They will require CADD drawings (both 2D and 3D) of existing topography, text, contours, points, triangles and existing ROW. The agreement may or may not require the consultants to “clean-up” topo and text drawings. For all new projects, consultants will follow the current General Contract Agreement.

Multimodal Projects – Similar to the Highway and Bridge projects.

Traffic Projects - Similar to the Highway and Bridge projects.

What do they need from us?

Link to Web page

All of our CADD customization is available online for consultants to download. This includes seed files, linestyle resource files, cell libraries and font resources. The web address is as follows: www.maine.gov/mdot/cadd-support/cadd-home.php . We highly

encourage them to use our customization. For more information, have them call ESSG's CADD support personnel.

Seed Files

We have quite a few seed files in our configuration. Instruct consultants to use our standard seed file called "usMDOT_SEED.dgn" for all U.S. Customary projects (MDOT_SEED for metric projects). These can be found on the CADD download page at the following address: www.maine.gov/mdot/cadd-support/microstation/downloads.php .

Our Standard file Structure/File Names

Consultants should follow our standard naming convention which is laid out on our webpage. The address is www.maine.gov/mdot/cadd-support/microstation/std_filename.php .

SENDING SURVEY FILES TO A CONSULTANT

MDOT Survey Data

Most of the consultants will require our survey data with the exception of Survey Consultants. When a Survey Editor is done editing MX data and creating MicroStation design files, they zip all the pertinent files into a single Zip file and place them in a consultant folder under the survey folder on the y:drive (i.e. y:\pin\8467\00\Survey\consultant\). The zip file will be named PINTOWN.zip (Figure 13-1). See breakdown below for explanation of the files included in the zip.

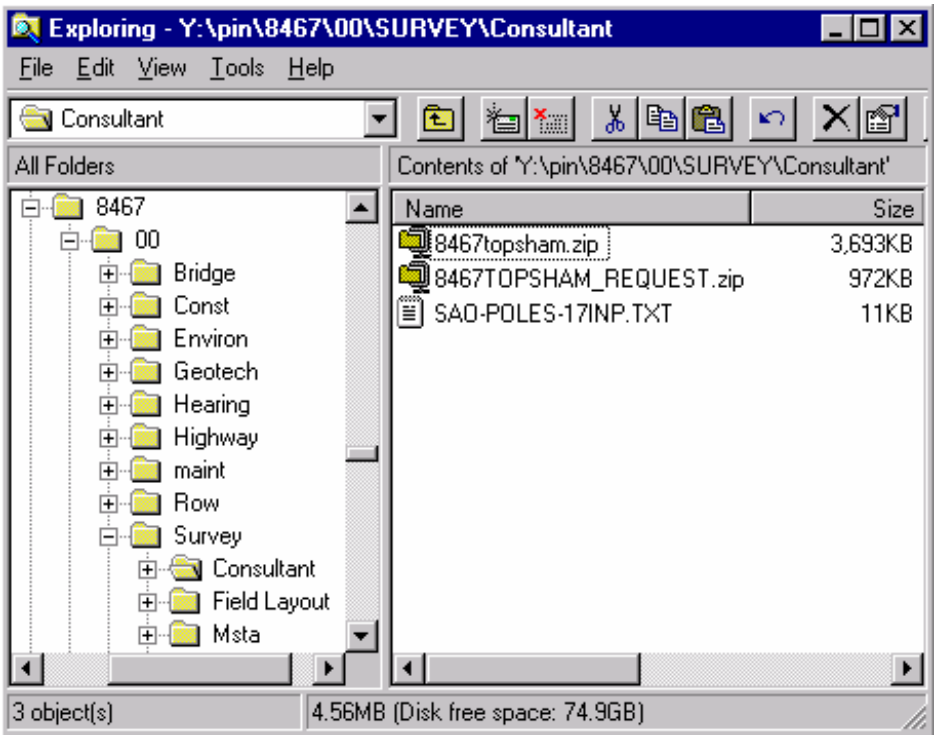


Figure 13-1: Example of zipped Survey Files ready to be sent to a consultant

Breakdown of files sent to a consultant

MX files:

Traverse.inp file(s) contains the adjusted Traverse & generates the Traverse Model.

Ground01.inp file(s) contains the topographic features from the field survey

Ground01.out file(s) contains the resulting X, Y, Z coordinates & associated point number above data.

Ground01.inc file(s) generates the topographic features with associated text.

Ground01.rep file(s) shows the labels X, Y, Z coordinates with associated text.

Contours.inp generates the Triangles & Contour Models.

Points01.str & Points01.txt file(s) generates the Point Numbers as surveyed from the field.

- MX users may need to process multiple sets of numbered files (i.e. ground01.inp through ground10.inp) as opposed to running the highest numbered file.

MicroStation files:

Topo.dgn is the Survey (cleaned-up and flattened). This file, if cleaned-up, is located in the topo folder of the PIN number.

Text.dgn is the text associated with Survey data (cleaned-up and flattened). This file, if cleaned-up, is located in the topo folder of the PIN number.

Points.dgn is the field Survey point numbers.

Contours.dgn is the 3D contours drawing. This file resides in the Survey\MSTA folder. There is a contours drawing in the topo folder also, but it has been flattened.

3Dtopo090902.dgn is the 3D MicroStation design file (.dgn) of the Survey.

Origtext.dgn is the 3D MicroStation design file (.dgn) of the text associated with Survey data.

Triangles.dgn is the 3D triangulation file (.dgn) for the project.

Mapping.dgn is the 3D MicroStation design file (.dgn) of the merged Mapping with Survey and Traverse (only on Photogrammetric Mapping projects).

MappingText.dgn is the 3D MicroStation design file (.dgn) of the merged text for Mapping and Survey (only on Photogrammetric Mapping projects).

MappingContours.dgn is the 3D MicroStation design file (.dgn) of the Mapping Contours (only on Photogrammetric Mapping projects).

MappingTriangles.dgn is the 3D MicroStation design file (.dgn) of the Mapping Triangles (only on Photogrammetric Mapping projects).

Step One: Posting files to Outgoing FTP site

Click your **Start** button and go to **Programs>WS_FTP LE>WS_FTP LE** or double click the icon (Figure 13-2) on your desktop.

Figure 13-2: FTP Icon

When the program opens you should see a **Session Properties** dialog. Press **OK** (Figure 13-3) to log into the FTP site.

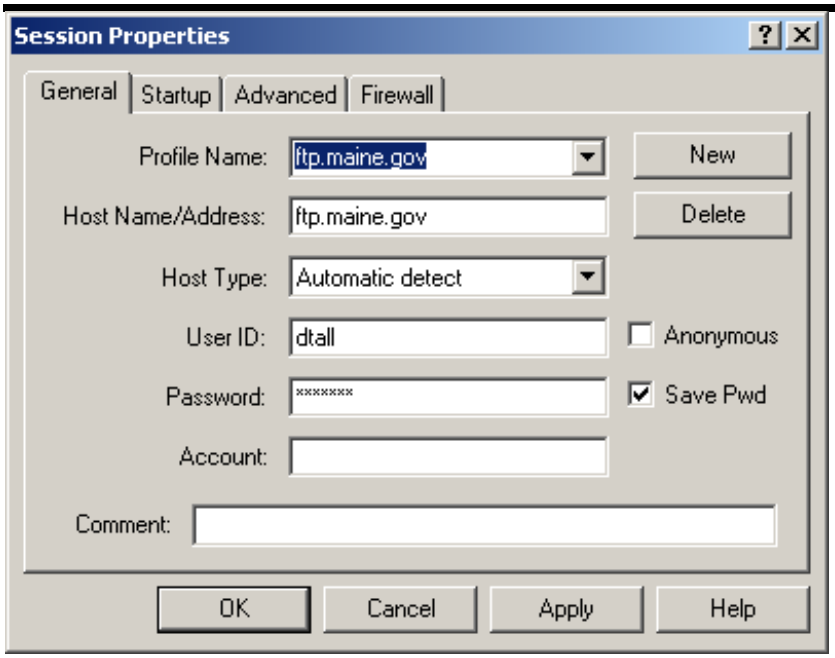


Figure 13-3: Session Properties

Step Two: Browse and Push Files to FTP

On the right side (**Remote Site)**, you should see the folder list, (incoming, outgoing, etc.) and on the left **(Local System)**, see a list of available drives. These are the drives you currently have mapped to your computer.

We have a folder for all **outgoing** files and a folder for all **incoming** files. Open the appropriate folder for the action you are taking.

In the **Local System** window, browse to the y:drive and folder where the file exists that requires transferring (i.e. y:\pin\8467\00\survey\consultant\). When the contents of the folder are displayed in the left section of the dialog area, highlight the desired file and click on the directional arrow (Figure 13-4) between the two view areas.

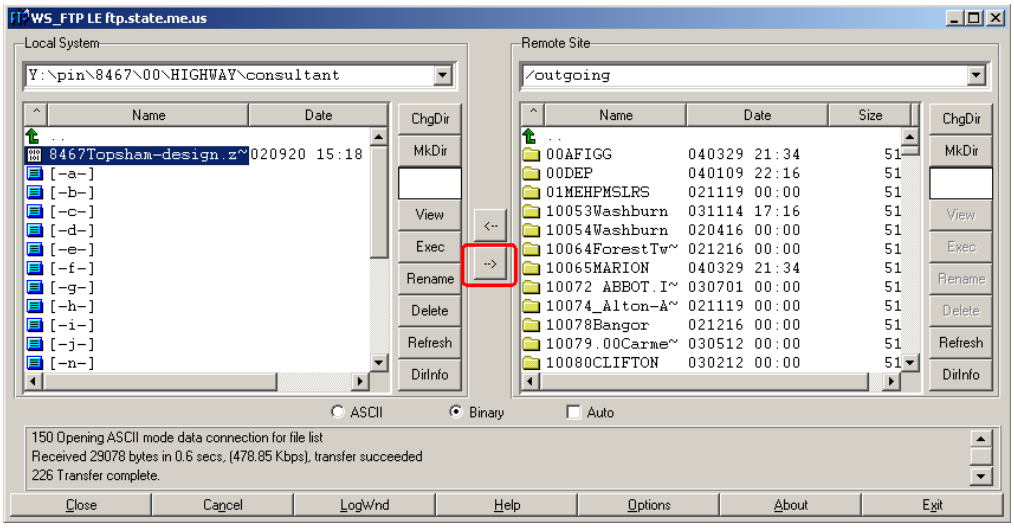


Figure 13-4: WS_FTP LE ftp.maine.gov

Step Three: Send Email with Link to File

Introduction

We can send a hyperlink in an email document that points directly to the file you posted, starting the download on their end automatically.

Or, we can also notify clients when a file is posted and provide them with the HOST (ftp.maine.gov) with the user (anonymous) and the password (anonymous). Then, by using a normal Internet browser or some type of FTP software, they can connect to our site and find the file and download it manually.

Part One: Type address to FTP in email

Type the complete address path and file name, within the body of an email message area and the recipient can click the link and start downloading to a specified location on their computer.

Here is an example: ftp.maine.gov/outgoing/8467topsham.zip.

ⓘ ***Always test the link by sending this to a coworker or to yourself. It doesn't always work in the draft email that you are preparing.***

- Use forward slashes between folders and never use spaces in the file names. Use lowercase for the ftp address and outgoing folder. Match the case of the file name you created.

Part Two: Add Subject Line and Send

Add the filename in the Subject line of your email. Provide a brief description of files attached. Click **Send.**

SENDING OTHER FILES TO A CONSULTANT

Step One: Create Consultant "Out" Folder

Open **Windows Explorer** and browse to your *Workgroup's* folder (i.e. Y:\pin\8467\00\HIGHWAY). **Right Click** and select **New>Folder.** Name this folder **Consultant.** Open this folder and **Right Click** and select **New>Folder.** Name this folder **OUT.** Open this folder. An example is shown in Figure 13-5.

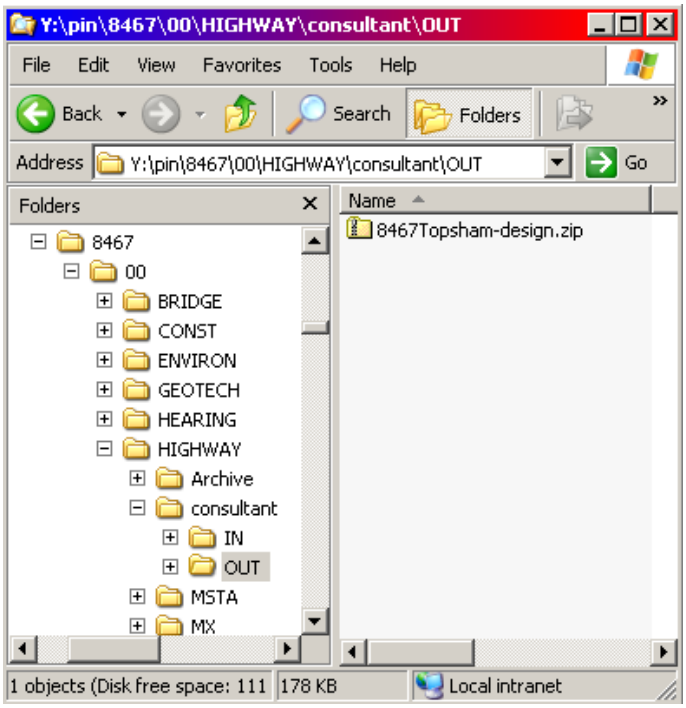


Figure 13-5: An example of a consultant folder structure

Step Two: Create a Zip file

Creating a Zip file is as easy as Right clicking and selecting **New>Compressed (zipped) Folder** in the folder where you want the zip file to exist (i.e. Y:\pin\8467\00\HIGHWAY\consultant\OUT). This will create a Compressed (zipped) file called "New Compressed (zipped) Folder.zip. Select the file and pick **File>Rename.** Supply a new name by typing the name and hitting enter. Be sure to add the ".zip" extension to the file name.

ⓘ ***Use good judgment when naming files. Rather than dumping random files without unique names to the FTP site, always use naming that will make it easy to identify your files from someone else's (i.e. 8467topsham.zip or 8467rwplan.zip).***

Select one or more files in Windows Explorer and drag and drop them onto the Zip file, or double click the zip file to open it, then drag and drop files from Windows Explorer into the Zip folder.

Step Three: Post to Outgoing FTP site

General Rules of Thumb!

1) Send a zip (compressed) file when sending more than one file, or files large in size.

2) Use good judgment when naming zip files. Do not dump random files (i.e. topo.dgn, Rwplan.dgn, text.dgn, highway.dgn, etc.) to the FTP site, always try and use unique naming that will make it easy to identify your zip file's from someone else's. (i.e. 8467topsham.zip)

3) Do not create a folder.

4) Clean up you own mess! BIS does house cleaning only when the server is too full to function. By then it's a crisis. Delete incoming files after you have downloaded them.

Open FTP Site

Follow steps previously documented in the **Sending Survey Files to a Consultant** section.

RECEIVING PROJECT FILES FROM A CONSULTANT

File Format

Older project that were started before the current GCA are grand fathered and we will accept .dwg or .dxf files. MicroStation can open/attach these files in their native format. If the consultant uses AutoCAD, request that they send MODEL SPACE drawings in our State Plane Coordinate System.

Newer contracts that are governed by the current GCA require that consultants send .dgn (MicroStation) files.

Drawings to Receive

The Department separates drawings by discipline and use referencing to combine all drawings necessary to produce a plan set. As previously stated in this document, consultant duties vary from project to project. Consultants doing ROW work should send back only the existing and/or proposed ROW files. If a consultant is doing proposed design for a project, they should be sending back an **alignments.dgn** and a **highway.dgn** or **bridge.dgn**. As the project nears completion, they should send all files relative to the project. They may or may not use our naming convention. We encourage them to follow our standard naming convention which is laid out on our website (www.maine.gov/mdot/cadd-support/microstation/std_filename.php). If they do not, it may be necessary that they include a text document that describes their filenames. It's up to you to rename these files if necessary and place them where they belong in the project directory.

What don't we want back?

Because we usually supply the consultant with Survey data, we do not want it back unless they have made significant changes to the topo and text files due to field review or inspection. If the consultant is required to clean up the topography, we would want the cleaned up version back from them and placed on our network. If they have added topography, have them send only the things that they have added. These items can be merged into our topo.dgn. Someone in-house may have cleaned up our copy of the topo.dgn so we may not want to replace it.

Step One: Create a Consultant Directory

Now we need to create a folder in the projects PIN structure for the consultants ".zip" file. This will be a record of what was received from them and the date of submittal.

Open **Windows Explorer** and browse to your *Workgroup's* folder (i.e. Y:\pin\8467\00\HIGHWAY). **Right Click** and select **New>Folder.** Name this folder **Consultant.** Open this folder and **Right Click** and select **New>Folder.** Name this folder **IN.** Open this folder. An example is shown in Figure 13-6.

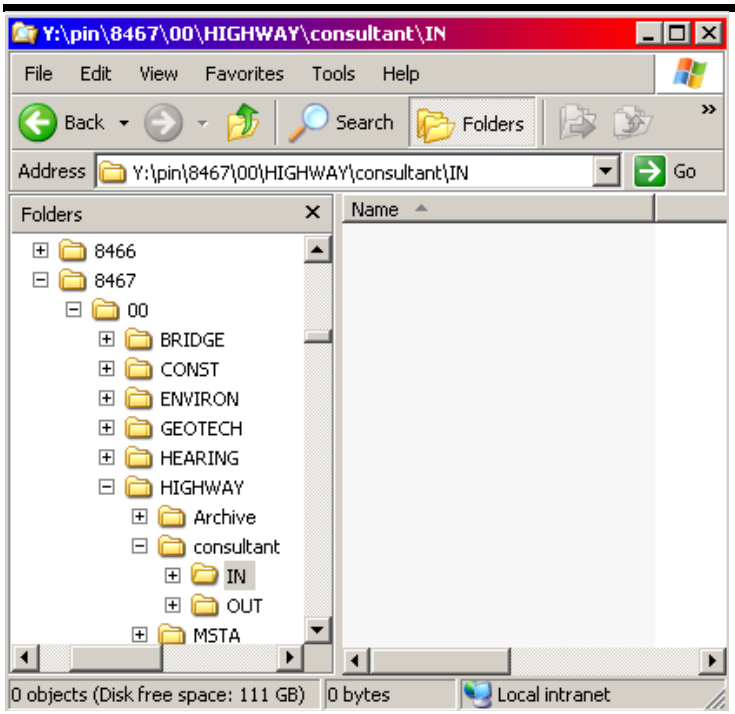


Figure 13-6: Consultant/IN folder in your Workgroup's folder

Step Two: Download Files From Incoming FTP Site

Part One: Open FTP software

Click your **Start** button and go to **Programs>WS_FTP LE>WS_FTP LE** or double click the icon (Figure 13-7) on your desktop.

Figure 13-7: FTP Icon

When the program opens you should see a **Session Properties** dialog. Press **OK** (Figure 13-8) to log into the FTP site.

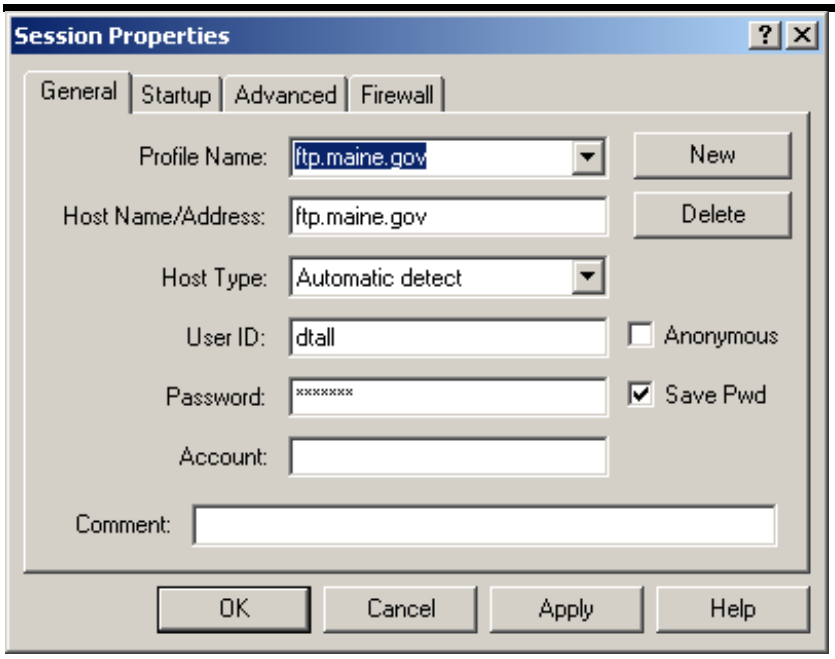


Figure 13-8: Session Properties

Part Two: Browse and Pull Files From FTP Site

In the **Local System** window, browse to the y:drive and to the folder you just created (i.e. y:\pin\8467\00\Highway\consultant\IN).

On the right side (**Remote Site)**, you should see the folder list, (incoming, outgoing, etc.). Open the **incoming** folder.

Locate the file that the consultant posted for you in the incoming folder and click on the directional arrow (Figure 13-9) between the two view areas. You should start to see the progress of the download. If you feel confident that the file was copied to the **Consultant\IN** folder, delete the file from the incoming folder. Close the FTP session.

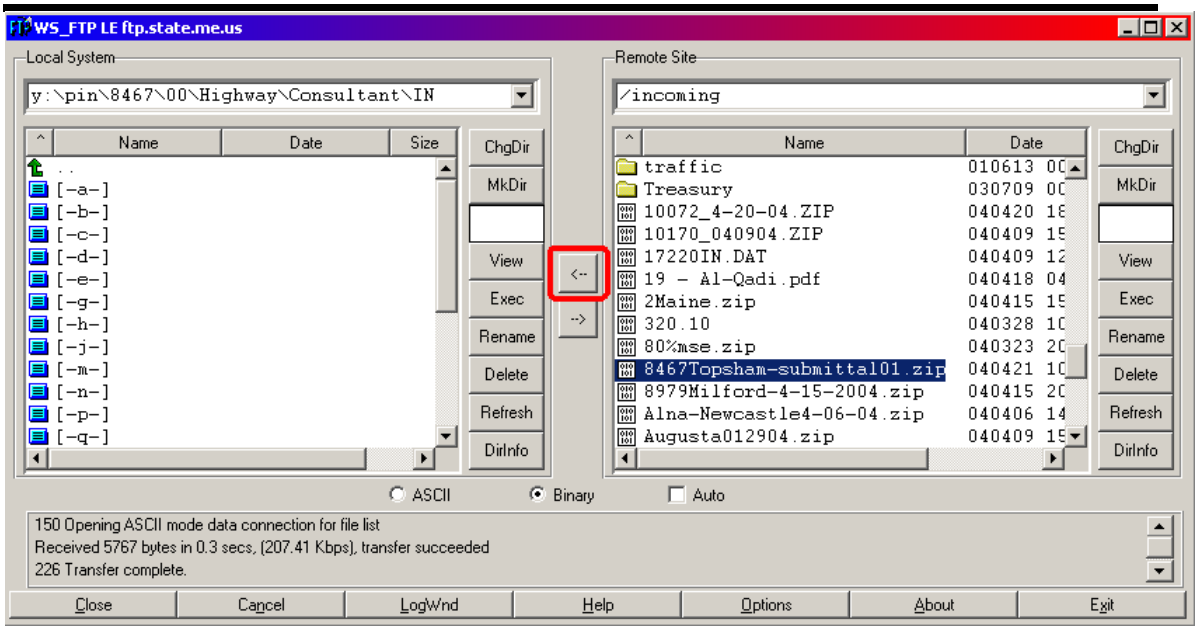


Figure 13-9: Incoming folder using WS_FTP LE ftp.maine.gov

Step Three: Extract Files from the Zip folder

Part One: Browse to your PIN's Consultant\IN Folder

Navigate to the **Consultant\IN** folder that you created in your project's PIN number. Locate the file that you just copied from the FTP site. Double click this file to display its contents (Figure 13-10).

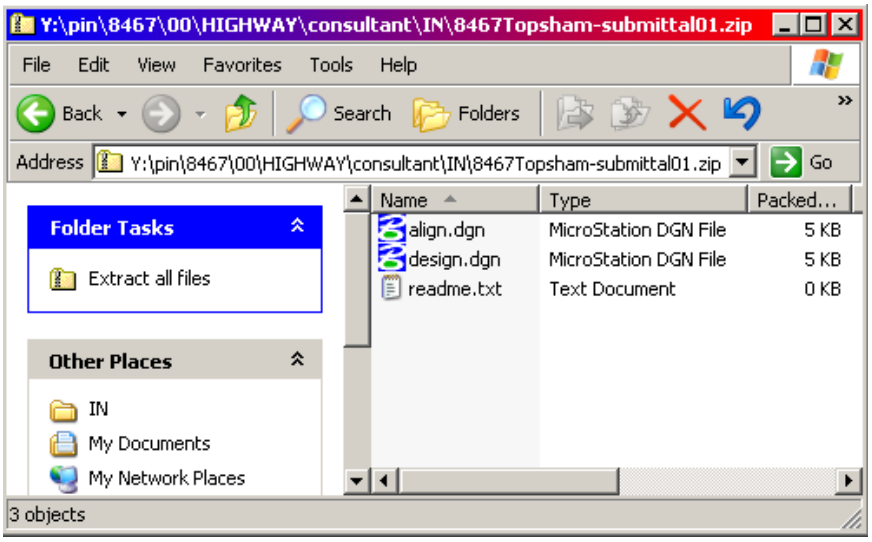


Figure 13-10: Contents of the zipped folder

Part Two: Extract Files to Consultant directory

From the Explorer menu, select **File>Extract All… .** The *Extraction Wizard* will open. Click **Next.** The next dialog window allows you to either browse to where you want to

place the extracted files or simply remove a portion of the path in the "*Files will be extracted to this directory"* window. Trim off the end of the path until you reach the **Consultant** folder (i.e. y:\pin\8467\00\highway\consultant). Click the **Next** button (Figure 13-11).

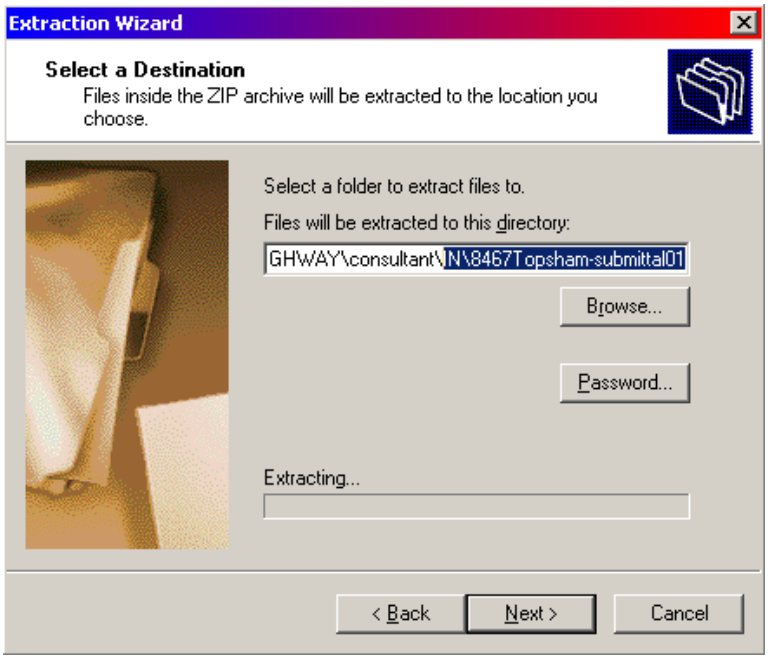


Figure 13-11: Remove part of the path to the desired directory in the Extraction Wizard

- We want to extract to the consultant directory temporarily.

Step Four: Rename Consultant files in Consultant\In Folder

Standard Naming Convention

We have standard names for files. We ask that consultants follow our naming convention, but chances are, some won't. A complete list of acceptable file names is listed on our web site. Here is the address: www.maine.gov/mdot/cadd-support/microstation/std_filename_root.php. It is up to the Consultant Coordinator to rename the files if necessary. Common file names are listed below.

Alignments.dgn - This is the proposed alignment file. It contains all Main Line and Side Road alignments including Curve Data and Bearings.

Highway.dgn - This is the proposed design file for a Highway project.

Bridge.dgn - This is the proposed design file for a Bridge project.

Rwplan.dgn - This is the file that will contain both existing and proposed ROW.

Renaming the Files

To rename a file, select the file and pick **File>Rename** from Windows Explorer's Main Menu. Type the new file name and be sure to include the file extension. Hit enter to complete this process.

Step Five: Move Files to Bridge\MSTA, Highway\MSTA or ROW\MSTA

MicroStation requires that files be in a certain place for them to be viewable to everyone as a reference file. Now you will have to **move** them into the correct location. Highlight the design files in the consultant folder. From the Main Menu, select **Edit>Cut.** On the left side of the window, click on the MSTA folder next to the consultant folder to display it's contents on the right. Select **Edit>Paste** to place the files into the MSTA folder.

ⓘ ***You may get a warning stating that there are files in the folder with the same names, "Do you want to overwrite them?". Consider moving the files into an "old" folder unless you are sure that they are complete replacements.***

- If you receive a Right of Way file, you may not have permissions to move it to the correct folder. Have your ROW technician move this file into the ROW\MSTA folder.

ⓘ ***It is important that all MicroStation files relative to the project exist in a MSTA folder. This is where MicroStation will look for files to reference.***

Step Six: Compare with our Files (Optional)

This is an optional step that might save a lot of headaches for someone in the future. If the drawing doesn't follow our standards, it will be apparent immediately when a person views it with our standard drawing files.

Open MicroStation

Click the MicroStation icon on your desktop. Select your project number from the project pull down.

Select a File to Open

Open a file that should be referencing the topography files and the proposed design files (i.e. hdplan.dgn or bdplan.dgn). Fit view. The files should line up correctly.

If all looks good…

If the files line up good, skip to the next step. If it doesn't, contact ESSG's CADD support for additional troubleshooting.

Step Seven: Send Message to Team Members

After the files have been named correctly and placed in the correct directory, it would be a

good idea to send a message to team members notifying them that the files are ready to be used.

RECEIVING UPDATES FROM A CONSULTANT

Communication

Communication is the key for receiving updates from a consultant. The update process is when a file can be unintentionally overwritten.

Is this a Complete Replacement?

Ask the consultant if the file is a replacement of a previous submittal, or if it's an addition to an existing file or simply a file to be added to the project files. It is better to receive a complete replacement unless it took a lot of manual editing on our end to get their file to meet our standards. In this case, we can reference and merge only the changes into the previous submittal.

Readme file

A readme.txt file is a good way for a consultant to describe what their intentions are. Encourage your consultant to include this in zip files that they submit.

Step One: Create an OLD folder

In order to keep a running record of what was submitted by a consultant, create an OLD folder under the workgroups MSTA folder (i.e. \Highway\MSTA\OLD).

Step Two: Move Older file(s) into the OLD folder

If a file is going to be completely replaced by a new one, move the older file into the old folder. In Windows Explorer, find the file to be replaced. Select it and pick **Edit>Cut** from the Main Menu. Click on the OLD folder on the left side of the Explorer window displaying the contents on the right. Select **Edit>Paste** from the Main Menu to paste it into the "old" folder.

- If you have placed files in the "old" folder already, and they have the same name of the files you are pasting, Windows may ask you if you to overwrite them. Select "OK"(Yes) to overwrite them. Keep only the latest "old" file.

Step Three: Copy File From FTP to Consultant folder

Use the same procedures as previously outlined for copying files from the incoming FTP site. This was outlined in the "Receiving Project Files from a Consultant" portion of this manual. If the consultant used the same file name as a previous zip, create an old folder under the Consultant\IN folder and move the older zip into the "old" folder. If the zip file name is different from any previous, leave all zip files in the consultant\IN folder.

Step Four: Extract files, Rename Accordingly and move to MSTA Folder

Use the Extracting procedures as outlined previously in this document ("Receiving Project Files from a Consultant"). Rename the file if necessary to follow our standard file naming.

Step Five: Compare with our Files (Optional)

This is an optional step that might save a lot of headaches for someone in the future. If the drawing doesn't follow our standards, it will be apparent immediately when a person views it with our standard drawing files.

Open MicroStation

Click the MicroStation icon on your desktop. Select your project number from the project pull down.

Select a File to Open

Open a file (i.e. hdplan.dgn or bdplan.dgn) that should be referencing the topography files and the proposed design files (alignments, highway, bridge and rwplan). Fit view. The files should line up correctly.

If all looks good…

If the files line up good, skip to the next step. If it doesn't, contact ESSG's CADD support for additional troubleshooting.

Step Six: Send Message to Team Members

Many team members may be using the files received from the consultant. It is a good idea that you send a message to them stating a revision has been made. This will keep the project flowing smoothly.

CREATING A .DWG

PROCESS OF SAVING A SINGLE FILE AS A DWG

Introduction

Occasionally a consultant may require an AutoCAD file. Find out what version of AutoCAD they are using. MicroStation can create the drawing using our file standards. It uses the active file's Global Origin, Level Structure, Units and Color table. It is recommended that you use the *Batch Converter* utility to convert multiple files or files that you haven't got permissions to.

Step One: Open file to be Converted

Open MicroStation, pick your project from the project pull down and open the file you wish to convert.

Step Two: Select File Save As…

Choose **File>Save As…** from the Main Menu. A dialog will open (Figure 13-12) giving you the opportunity to change the file type and directory path. From the "**Select Format to Save"** pull down, select **AutoCAD drawing file (*.dwg).** Browse to your *Workgroup's* **Consultant\OUT** directory (i.e. Y:\pin\8467\00\Highway\Consultant\OUT).

ⓘ ***If you are trying to convert reference files that you do not have permissions to (i.e. RWPlan.dgn), you may not be able to convert these files. MicroStation will attempt to write them to their original directory. In this case, browse to somewhere on your hard drive and all the files will be written there. Consider using the Batch Converter to define an Output directory that you have privileges to.***

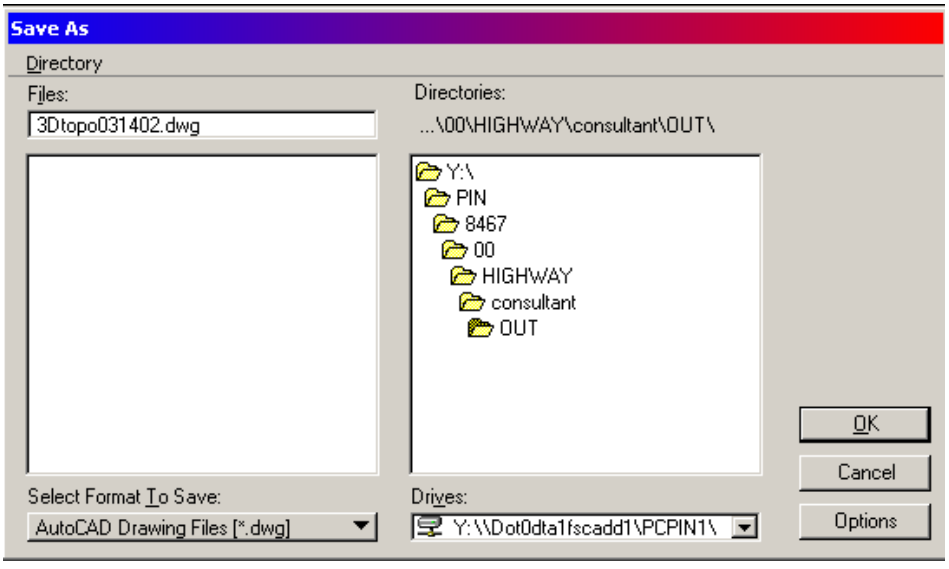


Figure 13-12: Save As dialog (.dwg File Format) pointing to the Workgroups Consultant/OUT directory*

- Put the file(s) in the consultant\OUT directory. This is where you will zip up the file(s) prior to placing them onto the FTP site.

Step Three: Adjust Options

Select the *Options* button in the **Save As…** dialog. In the *General* tab (Figure 13-13), pick the version of AutoCAD the consultant is using by clicking on the current value in the row. *Units* should be set to **Feet** or **Meters.** In the **DWG Seed File** area, click the current value to browse to MDOT's standard seed file folder (i.e. c:\!msv2004conf\standards\seed\DWG seed\). Depending on the project type, choose either the usMDOT_SEED.dwg or the MDOT_SEED.dwg (metric projects). Place a check mark in the *Drop Unsupported LineStyles* box. This will display our linestyles even though the consultant may not have them configured or mapped appropriately.

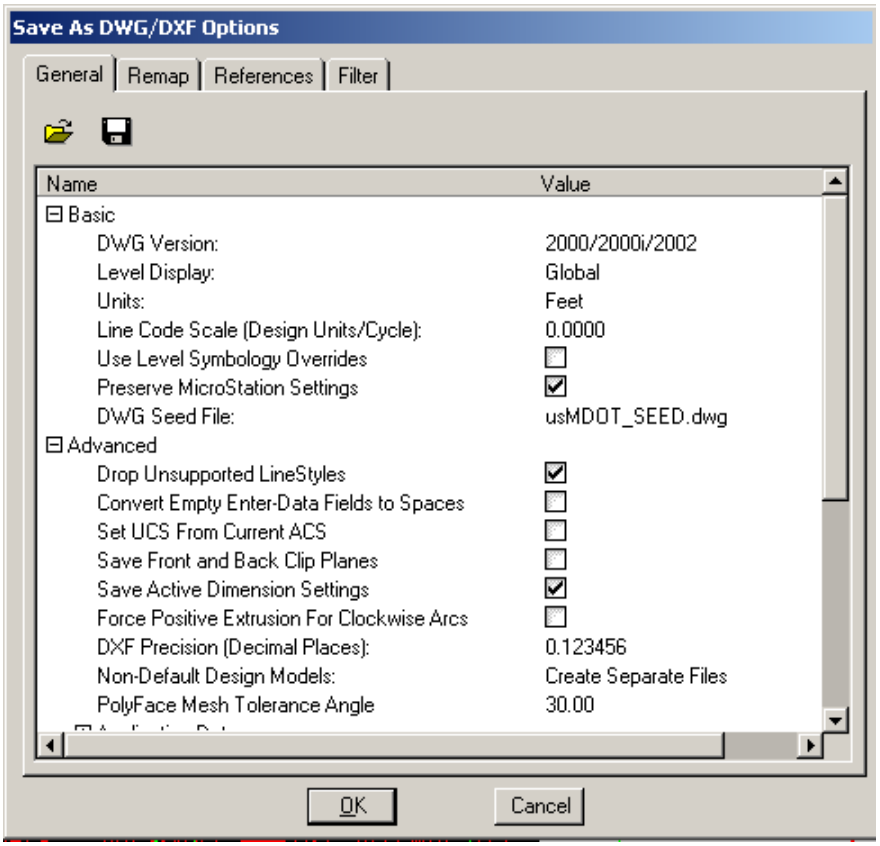


Figure 13-13: General tab with appropriate selections

Scroll down to the *Fonts* portion of the dialog (Figure 13-14). Expand the selection. Place a check mark in the box to *Convert MicroStation fonts to AutoCAD fonts.* Adjust the *SHX Output Directory* to point to the c:\temp folder.

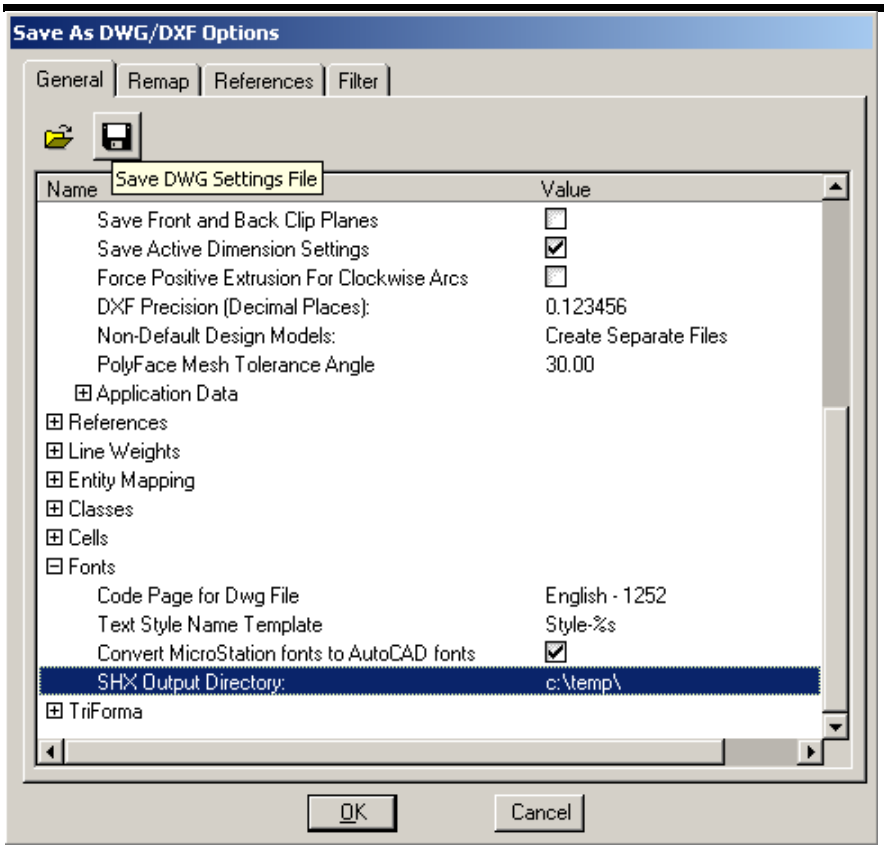


Figure 13-14: Adjust the Fonts portion of the dialog

There are many more adjustments possible on the *General* tab (Figure 13-14), however it's not recommended that you make other changes unless you are advised to do so from the consultant or CADD Support personnel.

The *Remap* tab is fine by default. Click on the *References* tab and adjust your options to those seen in Figure 13-15.

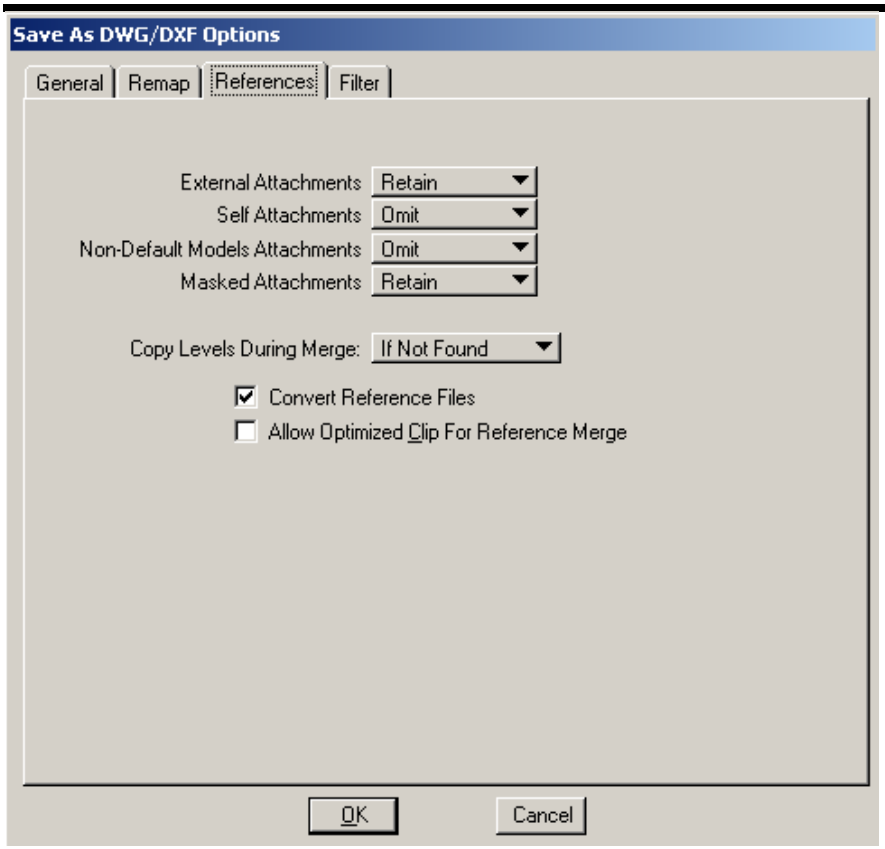


Figure 13-15: Save As Reference Tab options

Select the *Filter* tab and adjust your options to those seen in Figure 13-16.

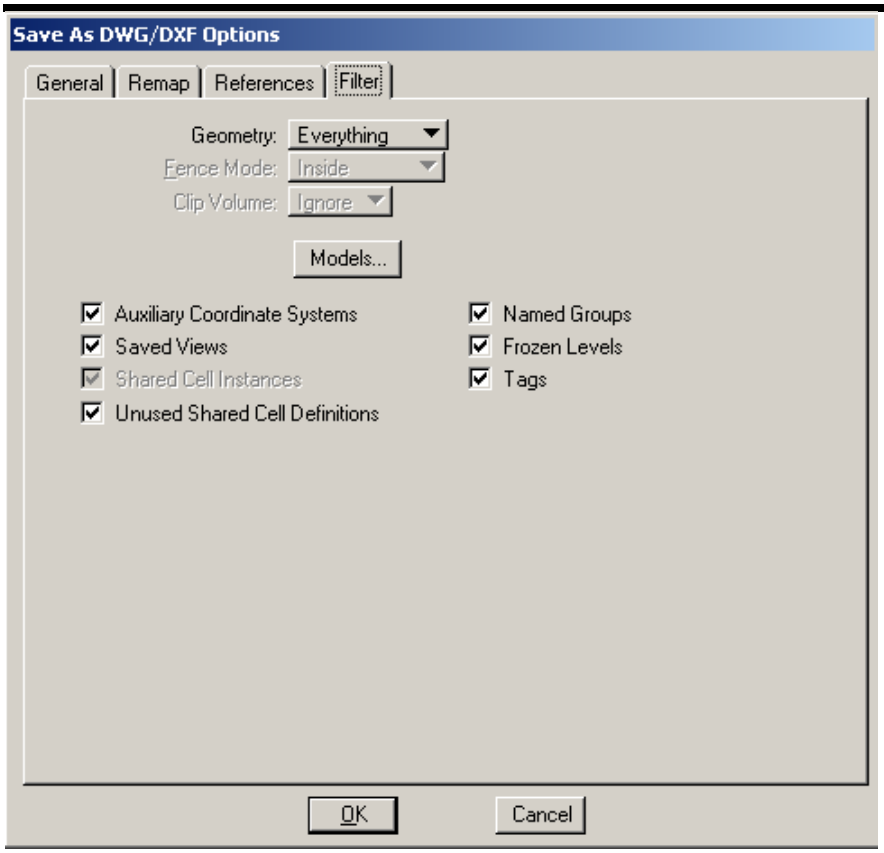


Figure 13-16: Save As Filter Tab options

Click **OK** and then **OK** again. The file(s) will be created in the same folder as the .dgn.

Step Four: Zip and FTP the File

MicroStation will also create resource file that AutoCAD can use to display the same Fonts and Linestyles in their drawing. Open Windows Explorer and browse to your C:\temp folder and copy all of the .shx files to your *Workgroup's* Consultant\OUT folder.

Browse to your *Workgroup's* consultant\OUT folder and Right Click and select **New>Compressed (zipped) Folder.** Rename it appropriately copy your .dwg and .shx files into it. Post it to the FTP site. Now that you have a record of what you sent in the Zip file, delete the single .dwg file and .shx files.

BATCH PROCESSING MULTIPLE FILES TO DWG

Introduction

If you need to create many DWG files it is quicker to setup a Batch job to do this. Sometimes you may need to convert and send the survey files as .dwg. You can add files from different directories for conversion also.

Step One: Open a File

Open MicroStation, pick your project from the project pull down and open any file, preferable one that you do not need to convert.

Step Two: Start Batch Utility

From the *Main Menu,* select **Utilities>Batch Converter…** The *Batch Convert* dialog will open. Select **DWG** from the *Default Output Format* pull down (Figure 13-17).

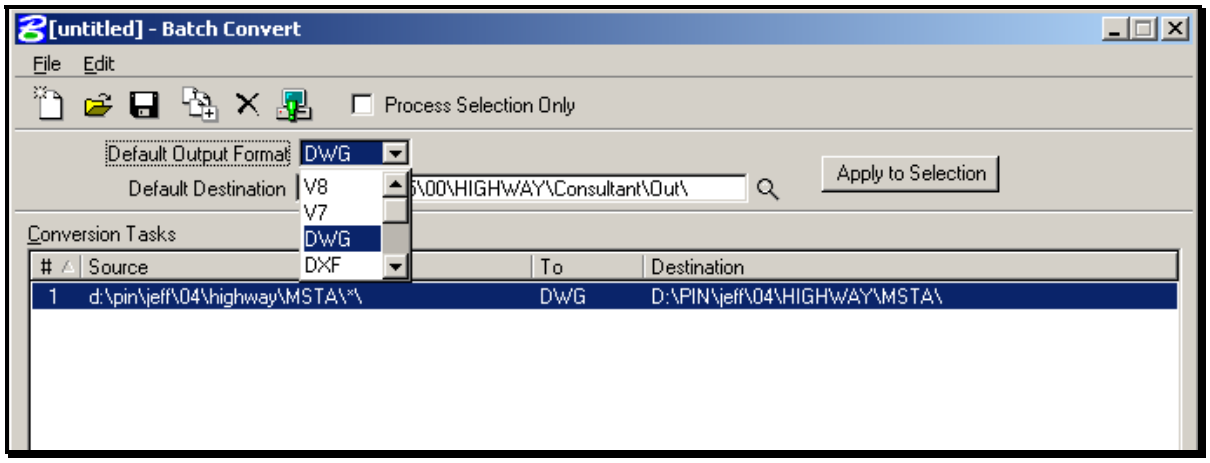


Figure 13-17: Changing the Default Output Format to DWG

Step Two: Adjust Options

Adjust the DWG output preferences by selecting **Edit>DWG Save Options.** These options should be set the same as you would for a single file conversion. See figures Figure 13-13, Figure 13-14, Figure 13-15 and Figure 13-16.

Step Three: Adjust Destination

In the *Default Destination* field, click the magnifying glass and browse to your *Workgroup's* consultant\OUT folder.

- If you change your mind about the destination you must highlight all of the files and select *Apply to Selection.*

Step Four: Add Files to Convert

Select **Edit>Add Files** from the *Batch Convert* dialog. A new dialog will open. Browse to the directory that contains the files you want to convert. Select them and click the **ADD** button (Figure 13-18). Browse to other directories and add more files if necessary.

Select a whole directory of files by selecting a folder in the right panel of the dialog and placing a check mark in the *Include Subdirectories* box (Figure 13-18). Click the **Add** button. Click the **Done** button when you're finished adding files or directories.

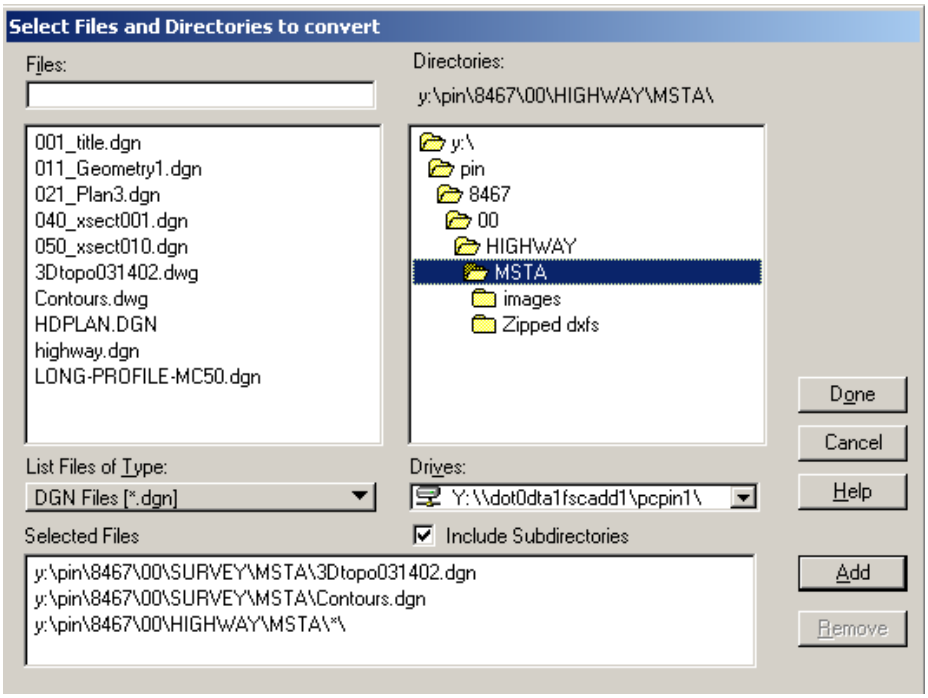


Figure 13-18: Select Files and Directories to Convert dialog

Step Five: Process Files

Select **File>Process…** from the *Batch Convert* menu. The *Files to Convert* dialog will open (Figure 13-19). Click the **Convert** button and it will show you the progress as it process the files.

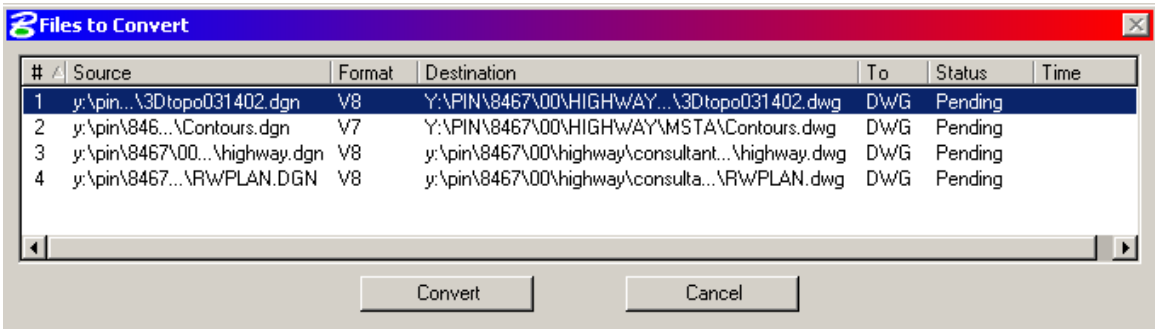


Figure 13-19: Files prepared to convert

ⓘ ***Occasionally you will receive a message (Figure 13-20) when a file doesn't get converted. Make note of which files fail during the conversion process. This message is very common. It may be because you are in a file that is referencing a file you are converting. Click OK.***

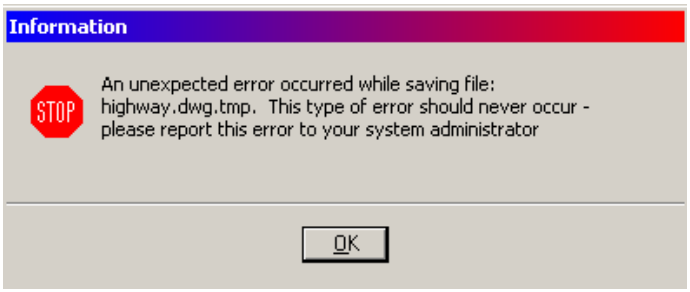


Figure 13-20: Unexpected Error message – Make note of file name

When the files have all been processed, the dialog (Figure 13-21) will display which files that were converted and which ones may have failed. Click DONE.

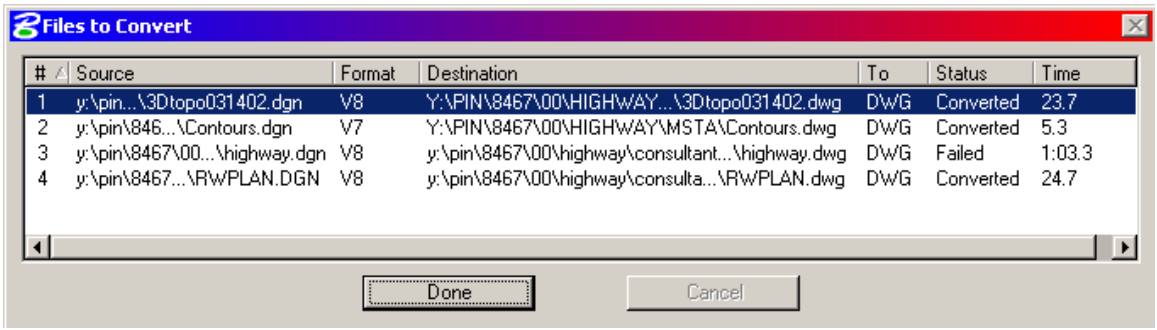


Figure 13-21: Dialog displaying the results

Re-process the file(s) that have failed. This time, select only the file or files that failed and place a check mark in the *Process Selection Only* box (Figure 13-22). Select **File>Process…** to start the conversion on the individual file(s). Second time usually works fine.

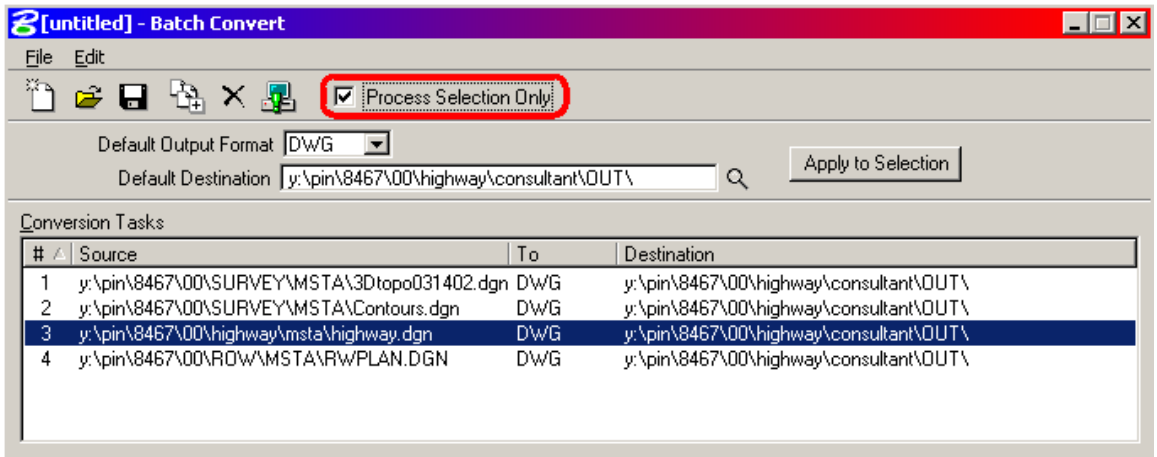


Figure 13-22: Selecting files and using the Process Selection Only box

When you have finished processing all of the files, close the dialog. It is not necessary to save the *Batch Convert* session.

Step Six: Zip and FTP the File

MicroStation will create resource files that AutoCAD can use to display the same Fonts and Linestyles in their drawing. Open Windows Explorer and browse to your C:\temp folder and copy all of the .shx files to your *Workgroup's* Consultant\OUT folder.

In your *Workgroup's* consultant\OUT folder and Right Click and select **New>Compressed (zipped) Folder.** Rename it appropriately copy your .dwg and .shx files into it. Post it to the FTP site. Now that you have a record of what you sent in the Zip file, delete the single .dwg file and .shx files.

Chapter 14 Using Packager (Archive)

PACKAGING A MICROSTATION FILE(S) – (VERSION 8 AND HIGHER)

This document is intended for the general user as a guideline to creating a "snapshot" of a project as it has reached a critical stage that needs to be preserved or as a means to transfer design files to a consultant that does not have our resource (linestyles) and cell libraries copied into their MicroStation configuration. In a sense, an archive is a zipped up copy of your original file or files and all reference attachments. It compacts the files into a single file about half the size of all files uncompressed.

The MicroStation *Packager* can package a single or multiple design files, with or without all of their reference files. A good example is a plan sheet. If you package a plan drawing (i.e. 011_HDPlan1.dgn), the *Package Utility* can include all files that need to be packaged to reproduce the drawing. You can also include *Workspace* items like cell libraries, linestyles, fonts and more, however, if the files are going to be used in-house, we will always be using our configuration so these options do not need to be stored in the package. If the package is going to be shared with consultants, these options will display our files with our symbology.

PACKAGING SINGLE OR MULTIPLE FILES

Step One: Open File to Package (Archive)

Open MicroStation. Pick your project from the project pull down. Open a file.

- If you are packaging a single file, open that file. If you are packaging multiple files, it doesn't matter which file that you open.

Step Two: Open Packaging Utility

From the main menu, select **Utilities>Packager…** . This opens the *Welcome* dialog (Figure 14-1). Select **Next.**

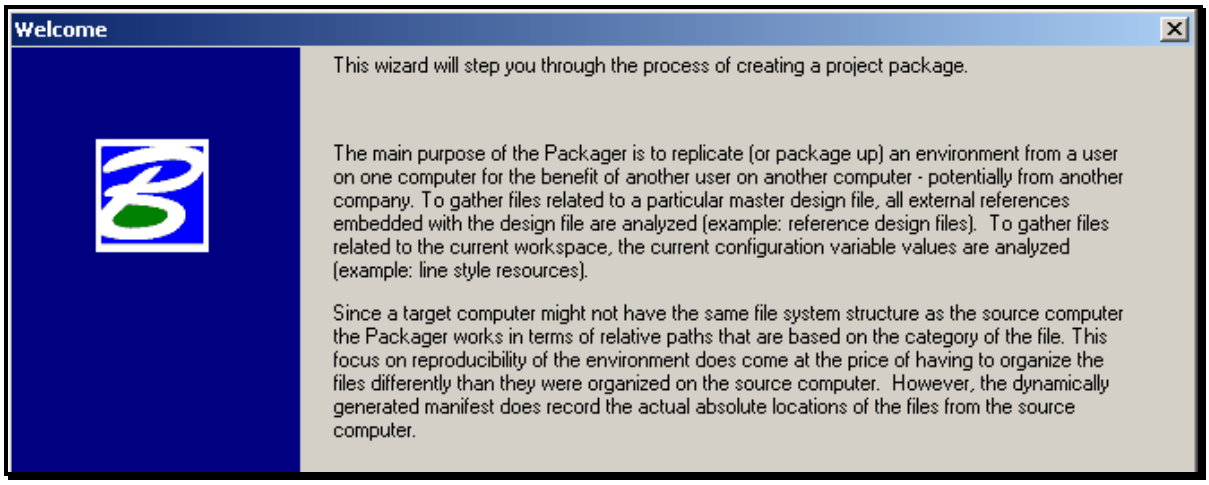


Figure 14-1: Create Package Welcome dialog

Step Three: Enter Package Name

Use a name that will identify the project from others. A good standard to follow is the PIN-TownName (i.e. 8467-Topsham). Do not use decimals in the file name. It is not necessary to enter a description, but it could be helpful to identify at which milestone it was archived. Select **Next.**

Step Four: Select Design Options

Select which design options you want to use. Normally, *Reference Files* is the only box you want to check (Figure 14-2). Select **Next.**

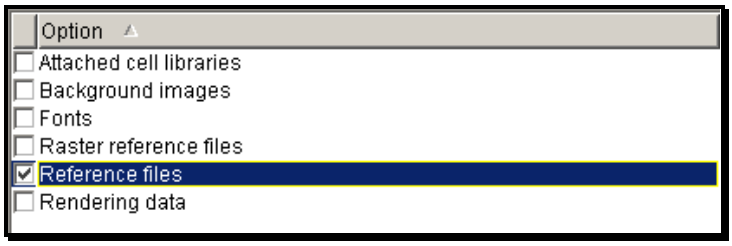


Figure 14-2: Design Options

- If you have images in your drawings, you will want to select *Raster Reference Files* also. If the package was going to be shared with consultants, you may want to include other options so it will be displayed correctly with our symbology.

Step Five: Gather Design Data

In this step (Figure 14-3), it gives you the option to select the *Current Design File, Current Directory or Browse* to select multiple files to *Package.* Remove the check mark in the *Recursive* box. This will prevent the *Packager* from digging down from the current directory into sub directories for design files. Make your selection, wait for it to finish processing, and then select **Next.**

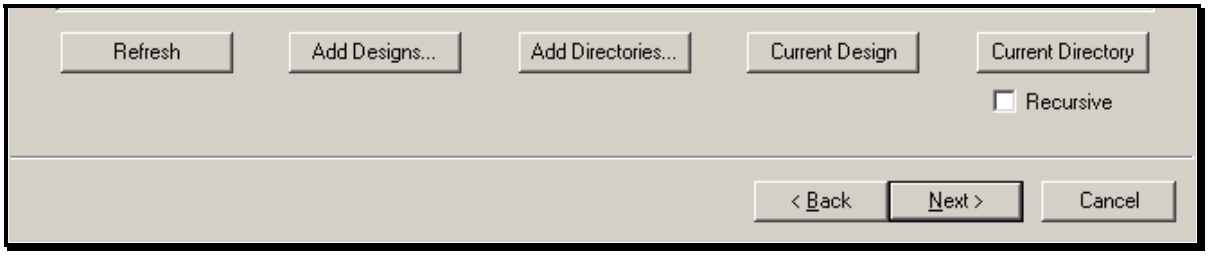


Figure 14-3: Create Package dialog – Recursive un-checked

Current Design File – This option will package the current design file with its reference files.

Current Directory – This option will package all MicroStation design files, AutoCAD .dwg and .dxf files.

Browse – This option allows you to select single or multiple design files to package. Use the **Ctrl** key on your keyboard to pick multiple files.

Refresh – This will refresh the list of files you have selected. If you uncheck a file that you do not want to be packaged, you must hit *Refresh* to remove it from the dialog window.

Step Six: Select Workspace Options

Normally we want to uncheck all of the *Workspace Options* (Figure 14-4). If the file(s) is to be shared with a consultant that doesn't use our configuration, you may want to select all of these options. Make your selection and select **Next.**

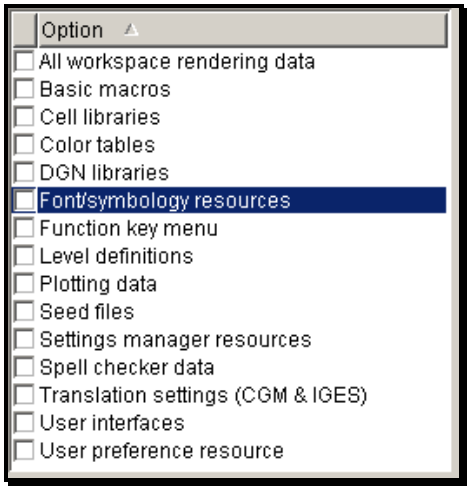


Figure 14-4: Workspace Options

Step Seven: Review Selections

This is the last opportunity to change your selections (Figure 14-5). You can still hit the *Back* button to go back through the steps. A few extra files get generated automatically. Do not delete these files. If all looks good, select **Next.**

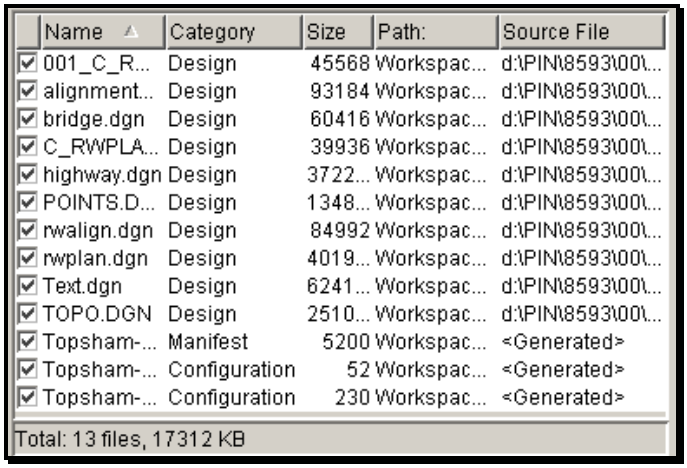


Figure 14-5: Review Selections dialog

Step Eight: Packaging Options

This step gives you the opportunity to adjust the location of the package file (Figure 14-6). The defaults are usually good unless you want to change the path to another folder location. Select **Next.**

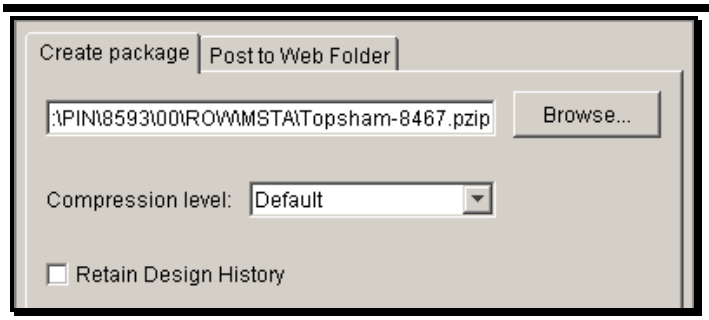


Figure 14-6: Adjust Path Options

- The *Retain Design History* box is to include the *Design History* of a file. It is basically a history of changes that have happened to the files. It is only as good as the information typed in by a user. (Full V8 files only).

Step Nine: Finish

Select *Finish* to begin the *Packaging* process.

OPENING A MICROSTATION V8 PACKAGE (.PZIP) FILE

It is not necessary to have MicroStation open during the extraction process, however it won't matter either way. These files can also be opened with any Zipping utility (i.e. WINZip).

EXTRACTING A PACKAGE FILE

Step One: Locate Package File

Browse to the location of the package file using Windows Explorer. The file has a .pzip file extension.

Step Two: Open the Package File

Double click the file to open it. The *Properties* tab (Figure 14-7) gives you a brief rundown of the file.

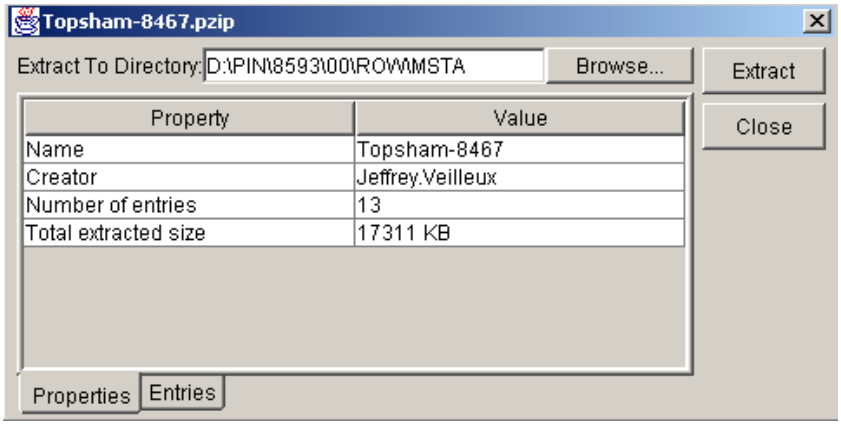


Figure 14-7: properties Tab in the PZIP

The *Entries* tab (Figure 14-8) displays the files that have been packaged.

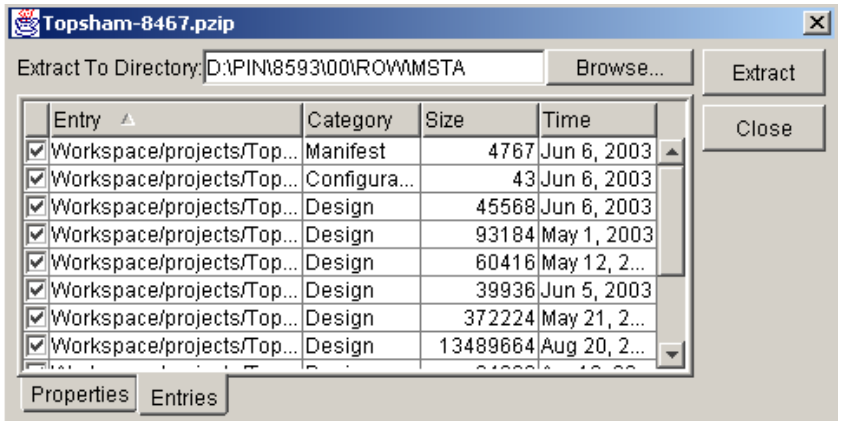


Figure 14-8: Entries Tab

Step Three: Set the Location for Extraction of Files

Notice the *Extract To Directory* portion of the dialog (Figure 14-8). Adjust the path to suit your needs by typing the new path or by hitting the *Browse* button.

- If you do not change the directory, you will not overwrite any existing files. It creates a folder structure of it's own within the target folder.

Step Four: Extracting the Package File

Click the *Extract* button (Figure 14-8). When Prompted to "Launch MicroStation?", say **NO!** (Figure 14-9)

Figure 14-9: Do Not Launce MicroStation – Click NO!

- If you say yes, MicroStation will be opened, however, it will not use any of our configuration files, therefore will not have our symbology.

Step Six: Finding the Extracted Files

When the files are extracted, they are placed in the folder you specified in Step Three, however, it creates a series of subfolders within the target folder. (i.e. Y:\PIN\8467\00\Highway\MSTA**Workspace\projects\Topsham-8467\dgn).** In this example, the characters in **bold** type represent the new folders created.

Step Seven: Opening, Moving or Copying the Extracted Files

Open the extracted files by select **No Project** from the *Project* pull down. You will have to browse to the files because they are buried in a subfolder. Because all the files live in the same folder, they will automatically display all of its reference files.

Use Windows Explorer to Move or Copy the files to a desired location. One possibility of its use is to replace files that have been corrupted, changed unintentionally, etc.

MICROSTATION ARCHIVING PROCEDURES (PRIOR TO V8)

EXTRACTING AN ARCHIVE

Prior to Version 8 (V8), MicroStation used a different program for Archiving. V8 does not allow you to create an archive, however, it does allow you to access an existing archive and extract the files. After identifying the files you wish to restore from the archive file, the Archive utility extracts those files from the archive file and copies them to a directory specified by the user.

Step One: Start Utility

Select **Utility>Archive** from the main menu.

Step Two: Open the Archive

In the Archive dialog box, click the Open Archive icon.
The Open Archive File dialog box opens. Browse to your PIN's Archive folder. Select the archive file from which files are to be extracted and click OK.

- The files which constitute the archive file are displayed in the Archive dialog box's list box.

Step Three: Select Files to Extract

In the list box, select the files to be extracted. Standard list selection techniques can be used to select more than one file. To select all files in an archive use the Select All item in the Archive Edit menu.

Step Four: Extract

Click the Extract Files icon. The Extract Archive Files dialog box opens (Figure 14-10), displaying information about the selected files along with destination options.

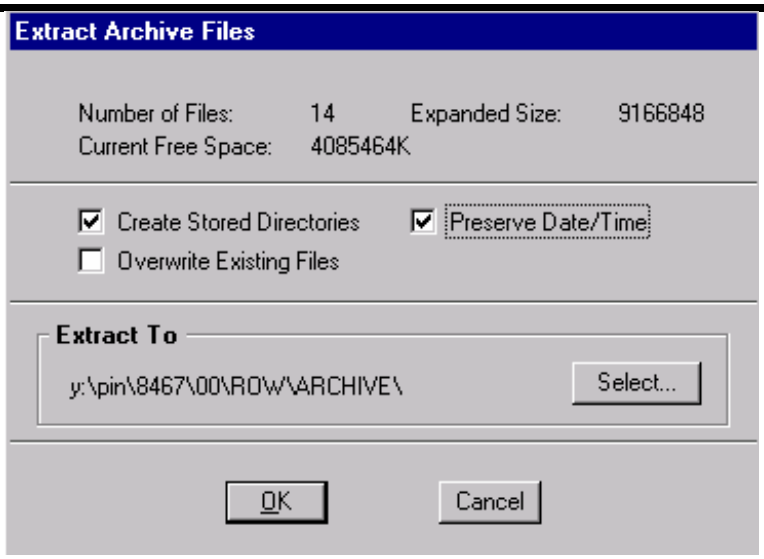


Figure 14-10: Extract Archive Files dialog

Step Five: Adjust Settings

Select the Create Stored Directories option. By default, the Archive utility will not use any directories stored as part of the archived file's path. By selecting this option, you direct the Archive utility to use stored directories as the destination path.

♫ If extracting drawings without referenced files attached, do not select this option.

Do not select the Overwrite Existing Files option unless your intension is to update the files on the network, whether the working drawings or an existing extracted archive. Destination will depend on which directories to overwrite. Permissions on the files should prevent you from overwriting files in another workgroup.

ⓘ ***Overwrite should be used with extreme caution. Be absolutely positive that you will not overwrite someone else's work on the network***

ⓘ ***When this option is selected, the extracted file will overwrite an existing file with the same name.***

Step Six: Preserve Date and Time

Select the Preserve Date/Time option. If on, the date/time of the extracted file will be copied from the compressed file, preserving its original values.

Step Seven: Set the Destination

In the Extract To section (Figure 14-10), click the **Select** button. The Extract To dialog box opens (Figure 14-11). Select a new path for the target directory to which the selected

design files will be restored and click OK. This path should be to your workgroup's archive folder in the PIN directory.

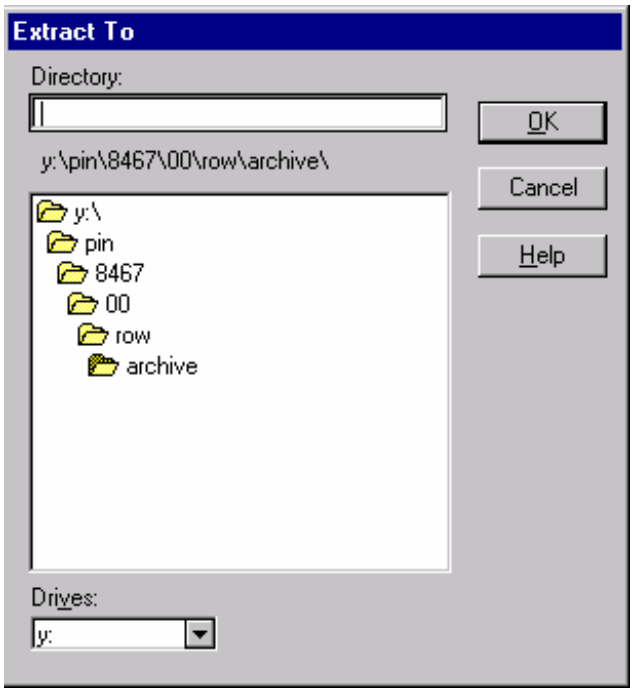


Figure 14-11: Extract To dialog

In the Extract Archive Files dialog box, click OK to begin the file extraction process (Figure 14-11).

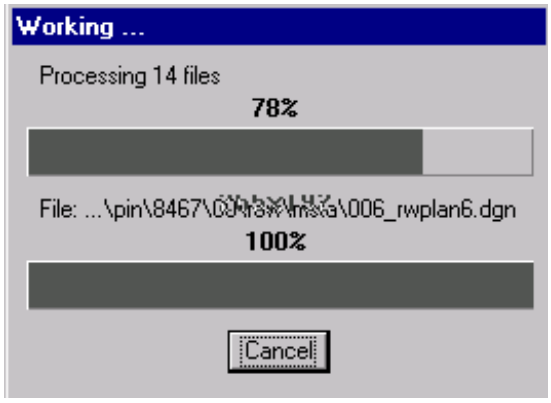


Figure 14-12: Working…

The working graphic is displayed (Figure 14-12).

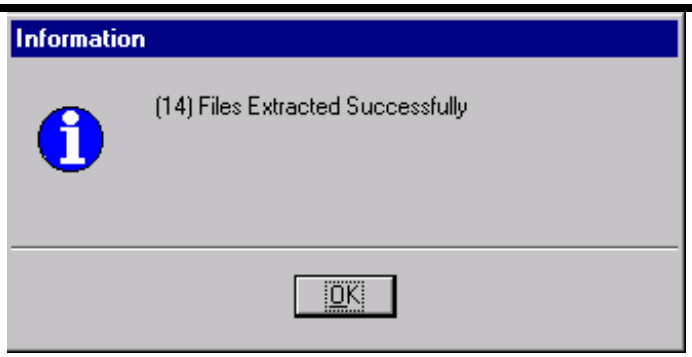


Figure 14-13: Information dialog

The information dialog (Figure 14-13) tells you if MicroStation was successful in extracting the files. Click **OK.**

Step Eight: Close the Archive Window

Click the "X" or **File>Exit** from the MicroStation Archive Window.

Chapter 15 Using Additional Software

USING ESTIMATOR

USING ESTIMATOR

Introduction

This is a description of how to use the Estimator for producing a cost sheet for pricing a project.

Step One: Getting into Estimator

First you will need to double click on the icon on your desktop. Once in you will need to log in. For that you will need to know the user name and password. Those are ***Beta*** for the user name and ***User*** for the password (Figure 15-1).

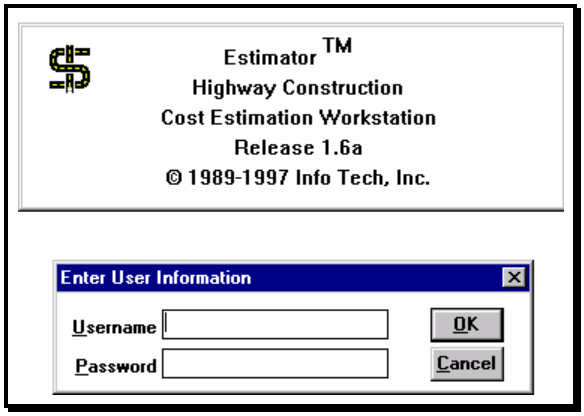


Figure 15-1: Log In to Estimator

Note: you must capitalize the first letter of each in order to get in.

ⓘ ***Contact CADD Support if you do not have an icon. Experienced users: Map any drive letter to \dot0dta1fsaug01\$Com-ProgMan\Highest\ folder. Create a shortcut on your desktop by right clicking the Highest.exe program and selecting Send To>Desktop (create shortcut).***

Step Two: Starting a new Estimator Project

Once in you will need to open a catalog of items. There are a couple of selections. Select the catalog based on the units in your project. To do so simply go to File > Open Catalog and select your catalog (Figure 15-2).

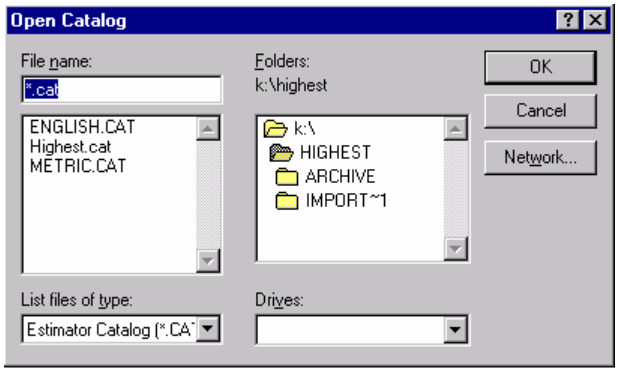


Figure 15-2: Select your Catalog

Next you will have to either select an existing file or you will have to create a new file. To open an existing file just simple choose **File > Open** and retrieve the file of interest. If it is a new file you will need to do **File > New** and an **Edit Project Header** box (Figure 15-3) will appear and you will need to supply some information about your project.

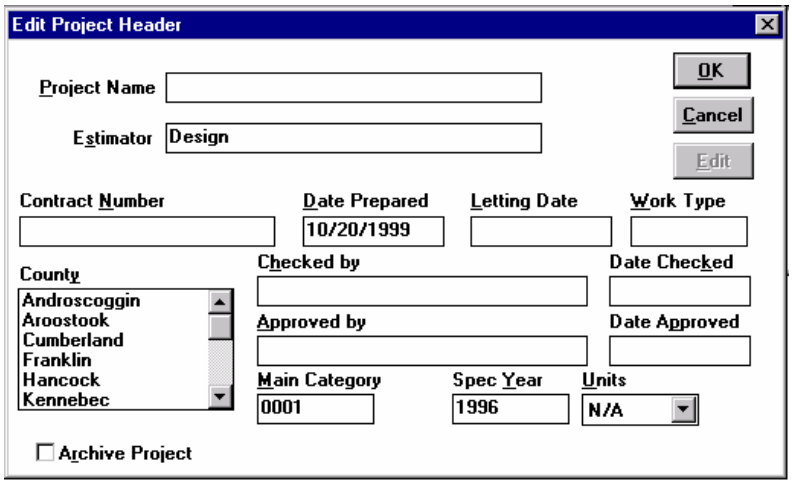


Figure 15-3: Edit Project Header

The type of information need is as follows:

Project Name (Town Name)

Contract Number (the Pin #)

Letting Date (Construction Begins)

Work Type (SB, LB, etc.)

Select County

Checked By (can be left blank)

Approved By (can be left blank)

Note: You will find a list of work types on the last page of this document.

Once you have provided the information, click O.K. and you will see the Project Header Box (Figure 15-4) pop up.

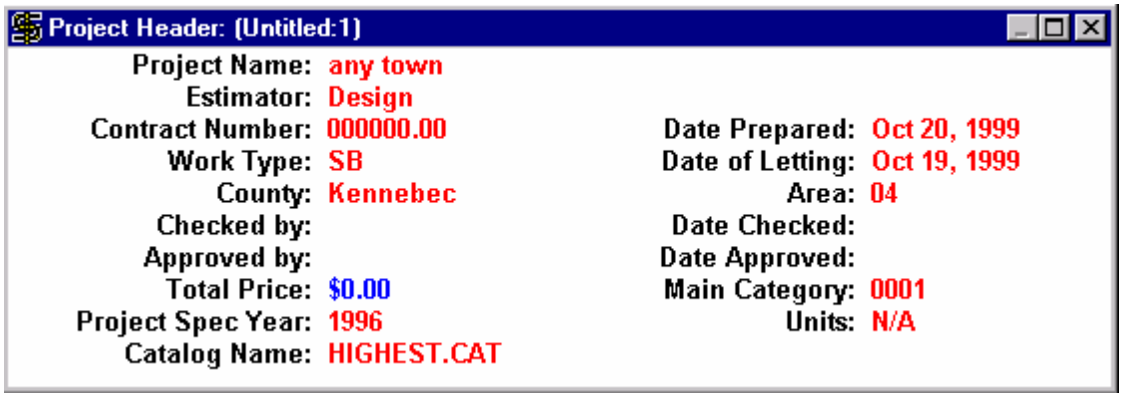


Figure 15-4: Project Header

Step Three: Adding items to the List

First you will need to double click on the **$0.00** and you will see another box pop up (Figure 15-5).

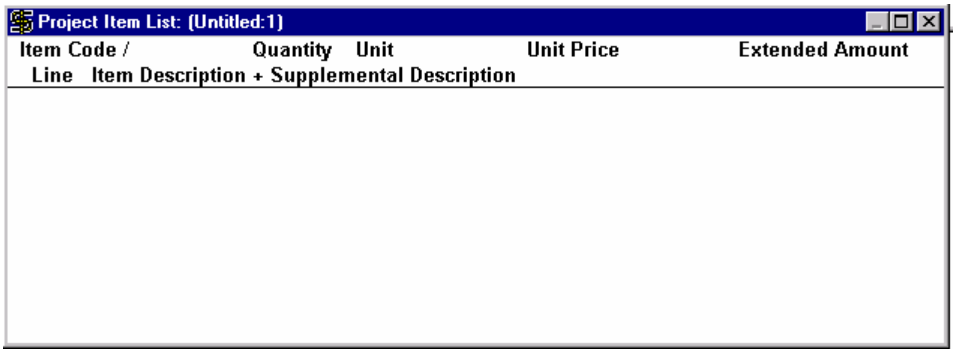


Figure 15-5: Empty Project Item List

Next you need to go to the menu at the top and select **Edit > Add** this will open up another box (Figure 15-6) which will allow you to start selecting the items pertaining to the project specified.

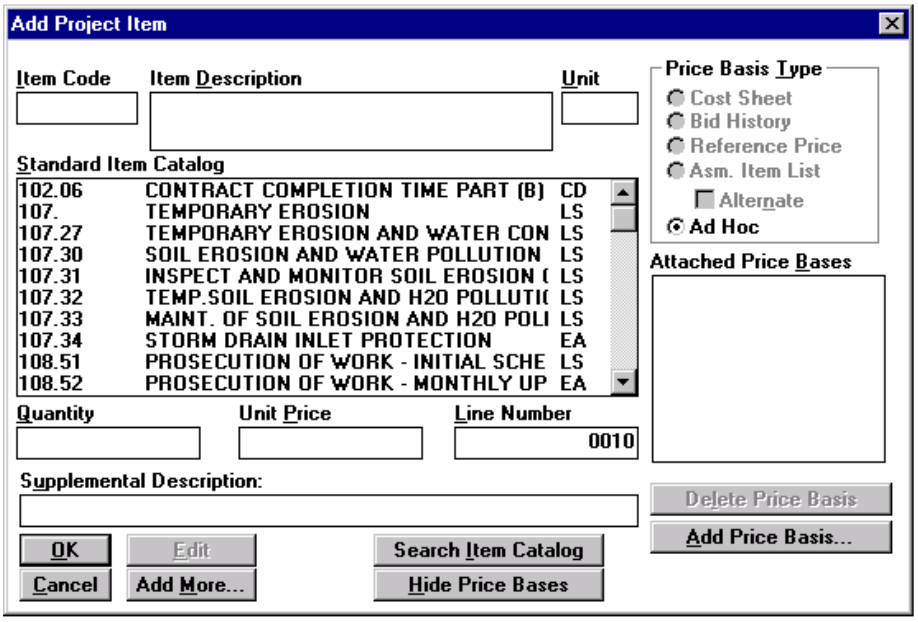


Figure 15-6: Add Project Item

Once you select an item you will then need to either hit in the Quantity field with your mouse or tab to it, in either case you will need to put a quantity there and then hit **Add More** to continue inputting item numbers and quantities.

When you are done completing your list just hit **O.K. and Cancel,** this should then bring you back to the list of items within the ***Project Item List*** as shown in Figure 15-7.

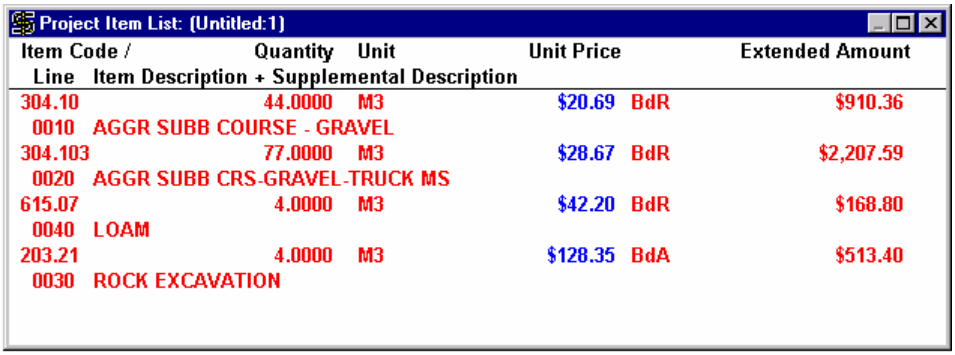


Figure 15-7: Project Item List

As you might have noticed that the list is not in numerical order. This is not a problem, you can easily fix this problem by simply going to the menu on top and selecting **Utilities > Sort** and this will bring up another dialog box that gives you numerous ways of sorting the item list. The most common selection would be sorting by *Item Code - Ascending Order* as shown in Figure 15-8.

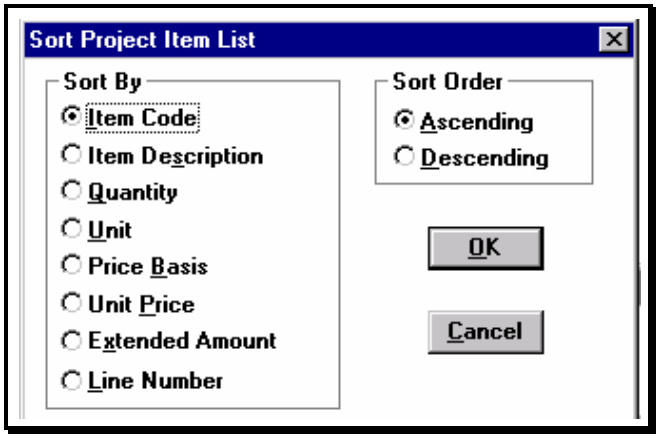


Figure 15-8: Sort Item List

Step Four: Editing Existing Data

It is fairly simple to edit existing *quantities* already in place and *Unit Prices (?)* that may not come out of the history of the item selected. To do this just click on the value you want to change and a box will appear to allow you to edit as shown in Figure 15-9 and Figure 15-10.

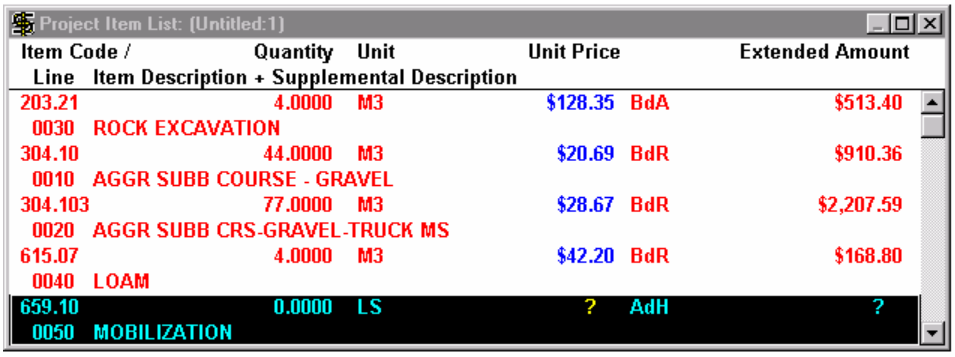


Figure 15-9: Project Item List

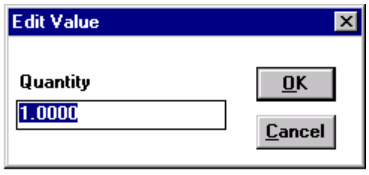


Figure 15-10: Edit Project Item Quantity

Step Five: Printing and Saving

To print go to the menu at the top and select **File > Print** and you should receive a display like Figure 15-11.

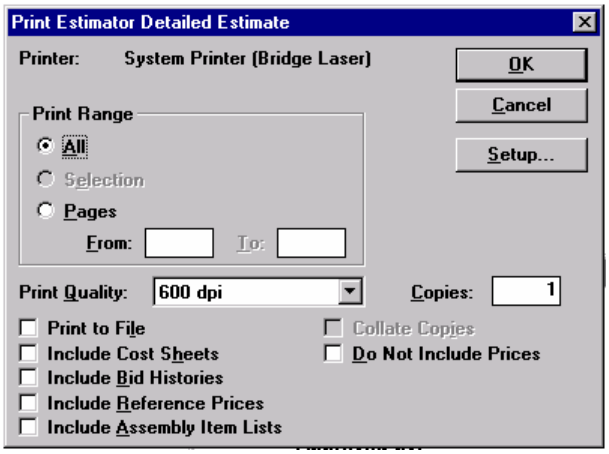


Figure 15-11: Print Estimator Detailed Estimate

You should verify your system printer is correct and you will notice that the default range is ***All***, hit **O.K.** and off to the printer it will go.

You also can use this item list for the front of your Estimate Book by checking off the selection for ***Do Not Include Prices*** and printing the document.

When complete always remember to save your document. The preferred naming convention is typical to our PIN structure. For example ***00567890.he.*** Also pay attention to the location that the file is being saved to. The process should point to the correct directory automatically, but on a rare occasion things do get messed up. The proper directory structure that the file should be in is ***:\Highest\00567890.he***

Project Work Type Codes

I = Interstate Highway Projects

R = Rural Highway Construction

U = Urban Highway Construction

HOV = Hot Bituminous Overlays

LOV = Light Bituminous Overlays

LB = Large Bridge Construction (15 m or over)

SB = Small Bridge Construction (Incl. Pipes)

BH = Bridge Rehabilitation

SIG = Traffic Signals

LIT = Lighting and Signing

L = Landscape

Additional Information

People should be aware that if the have an item that does not appear in the catalog selection set that they should notify ***Eric Erskine*** so that the item can be established into the program.

If you are having difficulty getting access to the program then you will need to speak to the appropriate support person to correct the problem.

FILE TRANSFER USING THE FTP SITE

GENERAL INFORMATION

What is an FTP (File Transfer Protocol) site? It's a secure drive on a computer, protected by a firewall, where files are temporarily stored completely accessible by any outside Internet connection. This allows consultants to do business with us while exchanging large amounts of data directly from computer to computer. Our FTP Internet address is ftp.maine.gov . This can be accessed through *Internet Explorer* if the recipient doesn't have FTP software. At that point, dragging and dropping files works best instead of Edit>Copy and Edit Paste. Consider sending a link in an email to files that are place on our FTP site.

Files over 10 Mb cannot be transferred via email. The State's email system stops the transfer of large files due to their size and the systems restraints. It is recommended that files over 10 Mb be transfered to outside sources by using this process.

General Rules of Thumb!

- Send a zip (compressed) file when sending more than one file, or files large in size.
- Use good judgment when naming files. Rather than dumping random files without explicit names to the FTP site, always use naming that will make it easy to identify your files from someone else's. (i.e. 8467topsham.zip)
- Do not create folders on the FTP site. Folders can be created within the outgoing folder, but are impossible to remove, due to protections that are set by BIS. Only *they* have privileges to remove them, regardless of who created them.
- Clean up you own mess! OIT does house cleaning only when the server is too full to function. Delete incoming files after you have downloaded them. Tell the consultant/recipient that they have permissions to delete the files you posted after they download them.

USING FTP

Step One: Open FTP Software

Click your **Start** button and go to **Programs>WS_FTP LE>WS_FTP LE** or double click the icon (Figure 15-12) on your desktop.

Figure 15-12: FTP Icon

When the program opens you should see a **Session Properties** dialog. Press **OK** (Figure 15-13) to log into the FTP site.

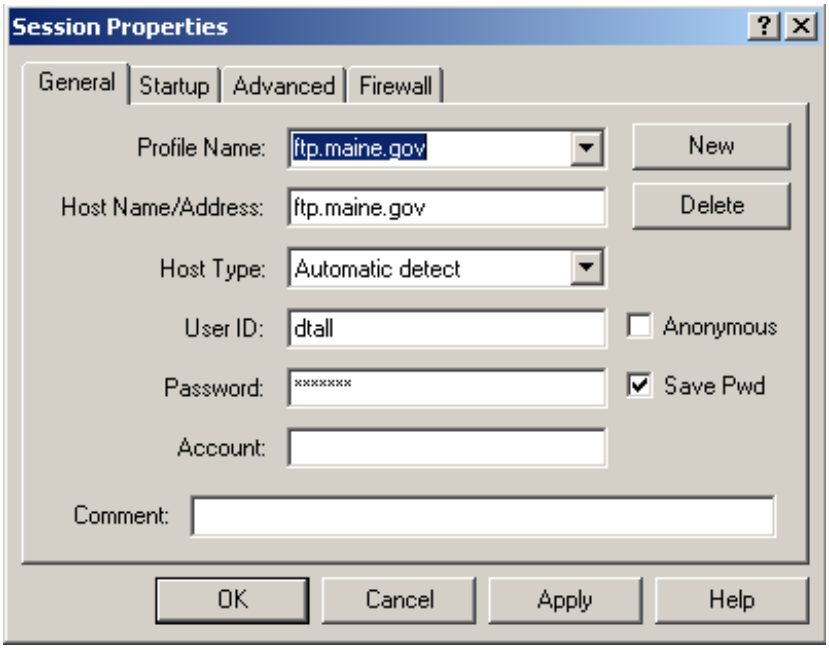


Figure 15-13: Session Properties

Step Two: Browse and Push Files to FTP

On the right side (**Remote Site)**, you should see the folder list, (incoming, outgoing, etc.) and on the left **(Local System)**, see a list of available drives. These are the drives you currently have mapped to your computer.

We have a folder for all **outgoing** files and a folder for all **incoming** files. Open the appropriate folder for the action you are taking.

Scroll and browse to the drive and folder where the file exists that requires transferring (i.e. y:\pin\8467\00\highway\consultant\topsham-design.zip). When the contents of the folder are displayed in the left section of the dialog area, highlight the desired file and click on the directional arrow (Figure 15-14) between the two view areas.

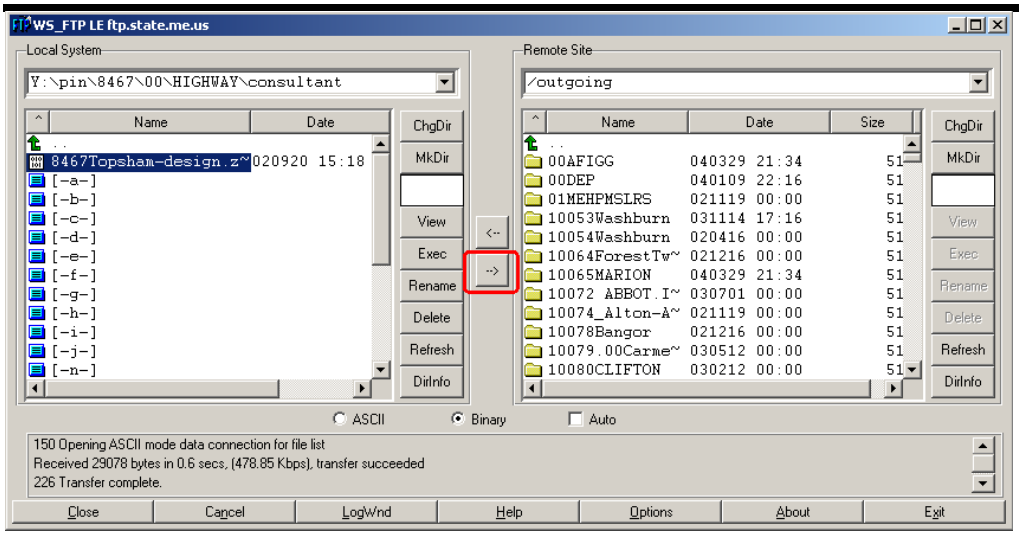


Figure 15-14: WS_FTP LE ftp.state.me.us

Use the same techniques to copy files from the incoming folder on the FTP site to a drive letter on the network or to your local hard drive.

SENDING LINKS IN EMAIL MESSAGES (OPTIONAL)

We can send a hyperlink in an email document that points directly to the file you posted, starting the download on their end automatically.

Or, we can also notify clients when a file is posted and provide them with the HOST (ftp.maine.gov) with the user (anonymous) and the password (anonymous). Then, by using a normal Internet browser or some type of FTP software, they can connect to our site and find the file and download it manually.

Step One: Type address to FTP in email

Type the complete address path and file name, within the body of an email message area and the recipient can click the link and select **Save** to start downloading to a specified location on their computer.

Here is an example: ftp.maine.gov/outgoing/8467topsham.zip.

- Use forward slashes between folders and never use spaces in the file names. Use lowercase for the ftp address and outgoing folder. Match the case of the file name you created.

Step Two: Test the Link

Even though the link shows up in the body of the email message, clicking it will not accurately verify that the link works. Send the email to yourself and test the link the emial. If it works, send the email to the recipient.

Step Three: Add Subject Line and Send

Add the filename in the Subject line of your email. Provide a brief description of files attached. Click **Send.**

USING AUTOTRACK – TURNING RADIUS SOFTWARE

AutoTrack is an add-on program for MicroStation, which is used for evaluating a design for turning movements of trucks, and any other large vehicles. We have purchased a 2 user network license, which means that only two users can be running AutoTrack at the same time on our network. Depending on the usefulness and demand for the product, we may increase the number of licenses in the future. AutoTrack must be separately installed on the PC of each user that is going to run it.

AUTOTRACK INSTALLATION

Introduction

The AutoTrack licensing system has been set up on the **Dot0dta1fscadd1** server. The installation steps below set up a client PC that will look to that server for its license. To avoid problems with our own customized MicroStation interface, we prefer not to let the AutoTrack install procedure "configure" the CAD system for us. Therefore, please follow these instructions carefully.

Step One: Browse to Folder

Using **Windows Explorer**, browse to the Y:\msworksp**AutoTrack** folder.

Step Two: Launch Setup

Double-click on **atr###.exe** to launch the installation process (i.e. atr700a.exe). These numbers will change as new versions become available. Click **RUN** to bypass the secutity warning. If a previous version is found, you will be asked if you want to unstall manually, uninstall previous versions without migrating your custom settings or uninstall and migrate your custom settings. If you've consciously made adjustments, then migrate your settings, otherwise, it may be a good time to start with a fresh install.

You will be asked if you want to install a Full copy. Choose **Yes**.

Click **Next** to begin the install program and click **Yes** to agree to the license terms. At the Customer Information page, enter State Of Maine as the *User Name* and enter Department Of transportation as the *Company Name.* Click **Next.**

When you get to the *Setup Type* screen, choose **Custom**.

Uncheck the *SavoyCAD (Stand alone version)* box and hit **Next.**

Click **Next** through to the last of a set of 5-6 pages, where you should see the version of MicroStation that we are using checked as an item in the list, with the path to the USTATION.EXE file listed to the right. Click **Next.**

Click **Next** to confirm the installation path.

Click **Next** again to confirm the selected components, and **Next** once more to install support for earlier versions of vehicle libraries.

Step Three: Adjust IP Address

You should now be at the *Network License Setup* page. Place a checkmark to signify that this is a network version. In the first IP Address line, enter the address of our **Dot0dta1fscadd1** server, which is **10 10 19 11**. Click **Next.**

Step Four: Update Advise

Uncheck the top box to prevent users from being able to run updates. All updates will be downloaded, tested and approved for use by the CADD Support Staff. Click **Next.**

ⓘ ***Do not attempt to upgrade/download a newer version of the software. Our server license is relative to the version we are using at any given time. We will notify you in the event of an upgrade that affects us.***

Step Five: CADD Configuration

You should now be at the **Configuration of CADD Systems** page. **Uncheck both** of the options on this page and click **Next** and click **Next** again to confirm the default program folder.

Step Six: Finishing up

On the next page, you can skip the Readme file and click **OK** to the next dialog mentioning the USB license install screen.

You will need to reboot the PC after the procedure completes.

USING AUTOTRACK (BASICS)

Introduction

We have purchased a 2 user network license. Only two users can be running AutoTrack at the same time. We've added menu items to load and unload AutoTrack during a MicroStation session. Use AutoTrack then unload it to release the license. Closing the file unloads it also.

Open MicroStation

Always open MicroStation from your desktop icon or from the *Start* menu. Select your project from the *Project* pull down. Open any file in your list of drawings.

Create a New Drawing

Use **File>Make Sheetz** to create a new drawing with *no prefix* called **Turning Radius.**

✓ *Refer to 1-18 for more information on the Make Sheetz process.*

♫ Using a new drawing to design your turning movements keeps this information separate from the files that another unit references by default.

Load AutoTrack

Start AutoTrack by selecting **Utilities>AutoTrack>Load AutoTrack.**

The Welcome dialog (Figure 15-15) should open as well as a new tool bar for AutoTrack (Figure 15-16) and an additional menu item called **Applications**.

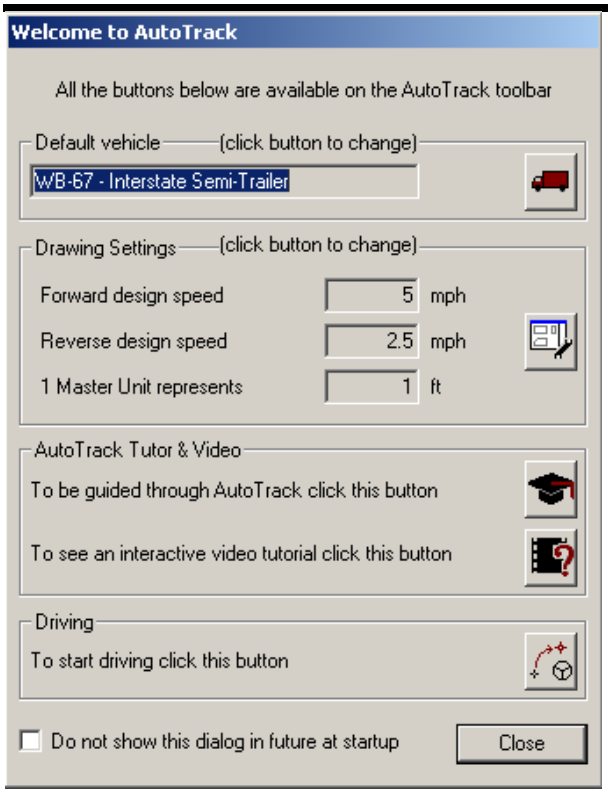


Figure 15-15: AutoTrack Welcome dialog

Figure 15-16: AutoTrack Toolbar for MicroStation

Set Default Vehicle (Optional)

It isn't necessary to select a default vehicle (Figure 15-15). You will be prompted for a vehicle when you hit any of the *Drive* options. If you do set a default, you will have an opportunity to change it after selecting a drive option.

Set Drawing Settings

You should always verify your *Drawing Settings* (Figure 15-15) during each session to set your units for AutoTrack, especially since we are producing both metric and U.S. Customary projects.

Start AutoTrack Tutor

Click on the AutoTrack Tutor icon (Figure 15-15) for guidance in using AutoTrack for the first time. It will provide a help screen that is relative to the dialog you are on.

For More Assistance, Read the Manual

The manual and tutor will be your best friend through the first few uses. Contact CADD Support for assistance.

VIEW AN AUTOTRACK DEMO (OPTIONAL)

Step One: Start Demo

Click Window's **Start** button and browse to the **\Programs\AutoTrack#\AutoTrack Tutorial Demonstration** program.

Step Two: View at Your Leisure

The demo is a good rundown of AutoTrack's functionality and multiple settings. It's a good idea to watch this 40 minute demonstration.

USING AUTOTRACK'S MANUAL AND HELP

AutoTrack On-Line Manual

An On-line Manual (in PDF format) can be launched independently from MicroStation by selecting **Start>Programs>AutoTrack #>AutoTrack Manual In PDF Format…**

It also can be launched from within MicroStation by selecting **Applications>AutoTrack>Help>AutoTrack Help…** from the *Main Menu.*

- The Table of Contents is linked to the rest of the document. The PDF document is fully searchable also.

ⓘ ***Do not attempt use the PDF installation instructions. Our installation instructions are specific to our workflow and licensing.***

AutoTrack's Webpage Knowledge Base

Use AutoTrack's websites (http://www.savoy.co.uk) to provide assistance also. Once you are at this site, you can select SUPPORT, then KNOWLEDGE BASE or KNOWN PROBLEMS and even ask for email support.

MAPPING A NETWORK DRIVE

Step One

Using Windows Explorer, go to **Tools>Map Network Drive**. In the Drive field, pick "**O**" if the drive is available. If not, another will do just fine.

Step Two

Select "**Reconnect at Login**".

Step Three

In the Folder field, enter **\\DT00DTA1PCFA102\D drive\ocers_q**.

Step Four

Click **Finish** and you should see another explorer window of the new mapped drive pop up for you. Close this window. Refer to this drive letter in *Windows Explorer* to check on plots that you send to the OCE9800 plotter.

Chapter 16 Standards

U.S. CUSTOMARY SCALES

SETTINGS MANAGER SCALES

Overview

The following scales are available through MicroStations Settings Managers. The scales described will inform you on what the absolute scale will be when referencing saved views to paper space borders.

1/32”=1’ 1:384

1/16”=1’ 1:192

3/32”=1’ 1:128

1/8”=1’ 1:96

3/16”=1’ 1:64

1/4”=1’ 1:48

3/8”=1’ 1:32

1/2”=1’ 1:24

3/4”=1’ 1:16

1” =1’ 1:12

1½”=1’ 1:8

2” =1’ 1:6

3” =1’ 1:4

6” =1’ 1:2

12” =1’ 1:1

1”= 4’ 48

1”= 5’ 60

1”= 10’ 120

1”= 20’ 240

1”= 25’ 300

1”= 30’ 360

1”= 40’ 480

1”= 50’ 600

1”= 60’ 720

1”= 100’ 1200

1”= 200’ 2400

1”= 400’ 4800

1”= 500’ 6000

1”= 1000’ 12000

LEVEL STRUCTURE

ROADWAY LEVEL STRUCTURE

This level structure is used for all plan related files.

Level Name	Level Number	Level Description
Default	0	
FRAME	1	Mx Boundary
BRIDGE_TITLE	2	Title Box Information
BORDER	3	Border Details
HIGHWAY_TITLE	4	Title Box Information
MINOR	5	Minor Grid Lines
MEDIUM	6	Medium Grid Lines
MAJOR	7	Major Grid Lines
H_V CONTROLS	8	PI, PT, PC, Curve Data, Etc.
H_V ANNOTATION	9	Stationing, etc
TEMPLATE	10	Roadway (in prof, xsc)
DTM	11	Triangulation (Mx)
GROUND	12	Ground&Level strings, spot elevs
POINTS	13	Mx Points
SUBGRADE	14	Subgrade limits
CUTFILLCLL	15	Cut, fill, clearing limit
CENTERLINE	16	Alignment and Stationing
ROAD	17	Travelway, Shoulder, Turning
CRB_SDWK_RAIL	18	Curb,Sidewalk,GRail,Indvdl Posts
SIGNS_TRAFFIC	19	Traff Items,Pvm Mrk,Signs w_Txt
ANNOTATION	20	Unless otherwise noted
PCRB_PSW_PRAIL	21	Prop. Curb,Sw,Grail,Indvdl Posts
DRIVE_FLD_LOT	23	Drives,Entrs,Field&Lot features
LAWN FEATS	24	Steps,yardlights,Satel dish,etc.
ROCKS	25	Ledge, Riprap, Boulders
BLDNGS_FEATS	29	Buildings,Carports,Slabs,etc.
PRPTY ENVRN	30	Septic,Wells,Graves,Fences,etc.
RIGHT OF WAY	31	ROW pins, Stonewalls, etc w_Text
PBSUPER	33	Prop Bridge Superstructure
PBSUB	34	Proposed Minor_SubStructures
MINOR STRUCTS	35	MultiPlate,Box culvert,sm bridge

Level Name	Level Number	Level Description
BRIDGE DECK	36	All Bridge Deck features
SUPERSTRUCT	37	NonDeck Superstr,Grdrs,Laterals
RETWAL_SUBSTR	38	Retwalls,Abuts,Piers,Brg Areas
OBSCURED	39	Undefined Mapping Area
BANNOTATION	40	Bridge Annotation
JUNK	41	JUNK LEVEL
WATER_DAM	42	Dams&Waterways 'cept wetlands
WTLND_RARE VEG	43	Wetlands and Rare trees_plants
TREES_BUSHES	44	Nonpay trees, bushes, not hedges
PAY TREES	45	Lrg Trees for Pay if Removed
WATR_VEGT TEXT	46	EnviroFeature & Vegetation Text
PVEGT	47	Proposed Vegetation
PVEGTTXT	48	Proposed Vegetation Text
TEXT	49	Complete Original Topo Text
UNCLASSED	50	Topo items not identifiable
PATTERNING	51	Hatching, Patterning, Shading
CLOSED DRNAGE	52	Closed Drainage Systm,CB's, etc.
OPEN DRNAGE	53	Open Drainage, not MultiPls Boxs
DRNAGE INVERTS	54	Open & Closed Drainage Inverts
PRE VERIFICATION	55	Borings, Test Pits
PDRAIN	56	Proposed Drainage
PDRAINTXT	57	Proposed Drainage Text
UTILS GRND	58	Utilities On or In Ground
UTILS AERIAL	59	Aerial Utilities (wire carrying)
PLOT BOUNDARY	60	Plotting Area
PUTIL	61	Proposed Utilities& Text
UTILITY TEXT	63	Text for All Utilities

ROW LEVEL STRUCTURE

This level structure is for all Right-of-Way files.

Level Name	Level Number	Level Description
Default	0	
BASE LINE	2	Base line
CURVE DATA	3	Curve Data
BEARINGS	4	All Bearings, alignment & bridge
North Arrows	5	Tentative North Arrows ea. Plan
CHIEF ENG SEAL	6	
H_V CONTROLS	8	Horizontal & Vertical Controls
Existing ROW	9	All lines for Exst Right of Way
ROW REFERENCES	10	All refrnces: Old prjs, Cnty,Twn
EX ROW NOTES	11	Notes re Existing Right of Way
EX ROW JUNK	12	Workspace for Exist ROW
Border	13	
PROPERTY LINES	14	Property lines, prvt easemnts,+
PROPERTY NOTES	16	Property notes for Final Plans
PRP OWNER NAMES	17	Property Owner Names
PROPERTY JUNK	18	WrkSpace for Prpty Owner work
PRPTY SETUPS	19	Property Owner Set-ups
POLITICAL BNDRY	22	County,State,Town Lines
MISCELLN TEXT	23	Miscellaneous Text
PROPSD ROW LINES	26	Proposed ROW Lines
PROPSD ROW NOTES	27	Proposed ROW Notes
PROP ALONG EXIST	28	
TIE LINES	30	Tie Lines
TIE STATIONS	31	Tie Stations
TIE DISTANCES	32	Tie Distances
PERM EASEMENTS	35	Slope Easements
TEMP RIGHTS	40	Other Permanent Easements
BASELN DIST_NTES	46	Baseline Distances & Notes
CONDEMNTN DISTS	47	Condemenation Distances
PARCEL DISTS	48	Parcel Distances
CLRLGD2	50	Color Legend Line1
Patterning	51	Driveway Hatching, etc.
JUNK	52	Miscellaneous Workspace
CLRLGD3	53	Color Legend Line2
CLRLGD4	54	Color Legend Line3
PLOT BOUNDARY	60	Border layout for plotting areas

STRUCTURAL DETAILING LEVELS

This level structure is used for all structural detailing files.

Level Name	Level Number	Level Description
Default	0	
Exist_ Structure	15	Existing Structure
Footing	16	Footing
Abutment	17	Abutment
Pier	18	Pier
Superstructure	19	Superstructure
Fram_Steel	20	Structural Framing/Stee
F_S Precast	21	Precast Struc Frm/Steel
Precast	22	Reserved
Rebar	23	Reinforcing Steel
Rebar Text	24	Reinforcing Steel Text
Retaining Wall	25	Retaining Wall Concrete
Dimensions	28	Dimensions
Buried Structure	30	Culverts, Pipes, Arches, Etc.
Approach	31	
Junk	50	
Patterning	51	Hatching / Filled Shapes

PUBLIC HEARING LEVELS

This level structure is used for Public Hearing Plans.

Level Name	Level Number	Level Description
Default	0	
P:TRAVEL:WAY	1	COLOR-6
P:SHOULDER:PAV	2	COLOR-253
P:SHOULDER:GRAV	3	COLOR-180
P:DRIVES:PAVED	4	COLOR-253
P:DRIVES:GRAV	5	COLOR-180
P:PAV:APRONS	6	COLOR-253
P:SIDEWALKS	7	COLOR-19
P:SLOPE-GRASS	8	COLOR-244
P:ISLAND:RAISED	9	COLOR-40
P:ISLAND:FLUSH	10	COLOR-229
WETLANDS:MITIG	11	COLOR-106
REMOV_BLD_TREE+	12	COLOR-2
CUT:SLOPE:LINE	13	COLOR-38 W-2
FILL:SLOPE:LINE	14	COLOR-5 W-2
P:CENTERE:LINE	15	COLOR-2 W-4
P:R_W:LINES	16	COLOR-30 W-4
TEXT	17	COLOR-1 & VAR--- S&W VARIABLE
TRAVEL:LANE:LINE	18	COLOR-1 W-4
DIR_ ARROWS	19	COLOR-1
P:SUB:GRADE	20	COLOR-27
P:BRIDGE:STEEL-1	21	COLOR-240
P:BRIDGE:STEEL-2	22	COLOR-242
P:BRIDGE:STEEL-3	23	COLOR-244
P:BRIDGE:WOOD-1	24	COLOR-176
P:BRIDGE:WOOD-2	25	COLOR-26
P:BRIDGE:WOOD-3	26	COLOR-25
P:BRIDGE:CONC-1	27	COLOR-18
P:BRIDGE:CONC-2	28	COLOR-17
P:BRIDGE:CONC-3	29	COLOR-16
PROPOSED:TREES	30	COLOR-136
P:DETOURS	31	COLOR-133
E:TRAVELWAY	32	COLOR-115
E:SHOULDERS	33	COLOR-116
E:DRIVES:E:LOTS	34	COLOR-117
E:BUILDINGS	35	COLOR-21
E:ISLANDS	36	COLOR-118
E:SIDEWALKS	37	COLOR-22
E:TREES:CONIF	38	COLOR-109
E:TREES:DECID	39	COLOR-39
E:WOODS	40	COLOR-56
E:BRUSH	41	COLOR-75
E:BUSH	42	COLOR-243
WATER-1	43	COLOR-151

Level Name	Level Number	Level Description
WATER-2	44	COLOR-153
WATER-3	45	COLOR-155
WATER-4	46	COLOR-156
WATER-5	47	COLOR-157
DEVERTED-WATER	48	WATERWAYS-DEVERTED-ALL
E:WETLANDS	49	COLOR-77
E:WOOD:WALLS	50	COLOR-182
E:GARDENS	51	COLOR-230
E:CENTER:LINES	52	COLOR-7 W-3
E:BRIDGE:DECK	53	COLOR-113
Level 54	54	
Level 55	55	
Level 56	56	
Level 57	57	
Level 58	58	
Level 59	59	
Level 60	60	
Level 61	61	
Level 62	62	
Level 63	63	

This level structure is used for Public Hearing Profiles.

Level Name	Level Number	Level Description
Default	0	
P:TRAVEL:WAY	1	
P:SHOULDER:PAV	2	
P:SHOULDER:GRAV	3	
P:DRIVES:PAVED	4	
P:DRIVES:GRAV	5	
P:PAV:APRONS	6	
P:SIDEWALKS	7	
P:SLOPE-GRASS	8	Survey Horiz. & Vert. Controls
P:ISLAND:RAISED	9	Text for Horiz/Vert Survey Cntrl
P:ISLAND:FLUSH	10	
WETLANDS:MITIG	11	
REMOV BLD TREE	12	Ground&Level strings, spot elevs
GROUND TEXT	13	Ground Text only
Level 14	14	
Level 15	15	
EX CENTERLINE	16	Apparent Existing Centerline
ROAD FEATURES	17	Road Feats.(Shldr,Pavement,etc.)
TRAVEL:LANE:LINECOLOR-1	18	Curb,Sidewalk,GRail,Indvdl Posts
SIGNS_TRAFFIC	19	Traff Items,Pvm Mrk,Signs w/Txt
P:SUB:GRADE	20	Roadway,Traff,Crb&Rail Text
Level 21	21	
Level 22	22	
DRIVE_FLD_LOT	23	Drives,Entrs,Field&Lot features

Level Name	Level Number	Level Description
P:BRIDGE:WOOD-1	24	Steps,yardlights,Satel dish,etc.
P:BRIDGE:WOOD-2	25	Ledge, Riprap, Boulders
P:BRIDGE:WOOD-3	26	Text for Features off Roadway
P:BRIDGE:CONC-1	27	
P:BRIDGE:CONC-2	28	
P:BRIDGE:CONC-3	29	Buildings,Carports,Slabs,etc.
PROPOSED:TREES	30	Septic,Wells,Graves,Fences,etc.
P:DETOURS	31	ROW pins, Stonewalls, etc w/Text
E:TRAVELWAY	32	Text for Buildings,etc. NOT ROW
E:SHOULDERS	33	
E:DRIVES:E:LOTS	34	
E:BUILDINGS	35	MultiPlate,Box culvert,sm bridge
E:ISLANDS	36	All Bridge Deck features
E:SIDEWALKS	37	NonDeck Superstr,Grdrs,Laterals
E:TREES:CONIF	38	Retwalls,Abuts,Piers,Brg Areas
E:TREES:DECID	39	Bridge & Retaining Wall Text
E:WOODS	40	
E:BRUSH	41	
E:BUSH	42	Dams&Waterways 'cept wetlands
WATER-1	43	Wetlands and Rare trees/plants
WATER-2	44	Nonpay trees, bushes, not hedges
WATER-3	45	Lrg Trees for Pay if Removed
WATER-4	46	EnviroFeature & Vegetation Text
WATER-5	47	
DEVERTED-WATER	48	
E:WETLANDS	49	Complete Original Topo Text
E:WOOD:WALLS	50	Topo items not identifiable
E:GARDENS	51	
CLOSED DRNAGE	52	Closed Drainage Systm,CB's, etc.
E:BRIDGE:DECK	53	Open Drainage, not MultiPls Boxs
Level 54	54	Open & Closed Drainage Inverts
Level 55	55	Text for All Drainage Elements
Level 56	56	
Level 57	57	
Level 58	58	Utilities On or In Ground
Level 59	59	Aerial Utilities (wire carrying)
Level 60	60	Text for All Utilities
Level 61	61	
Level 62	62	
Level 63	63	

This level structure is used for Public Hearing Sections.

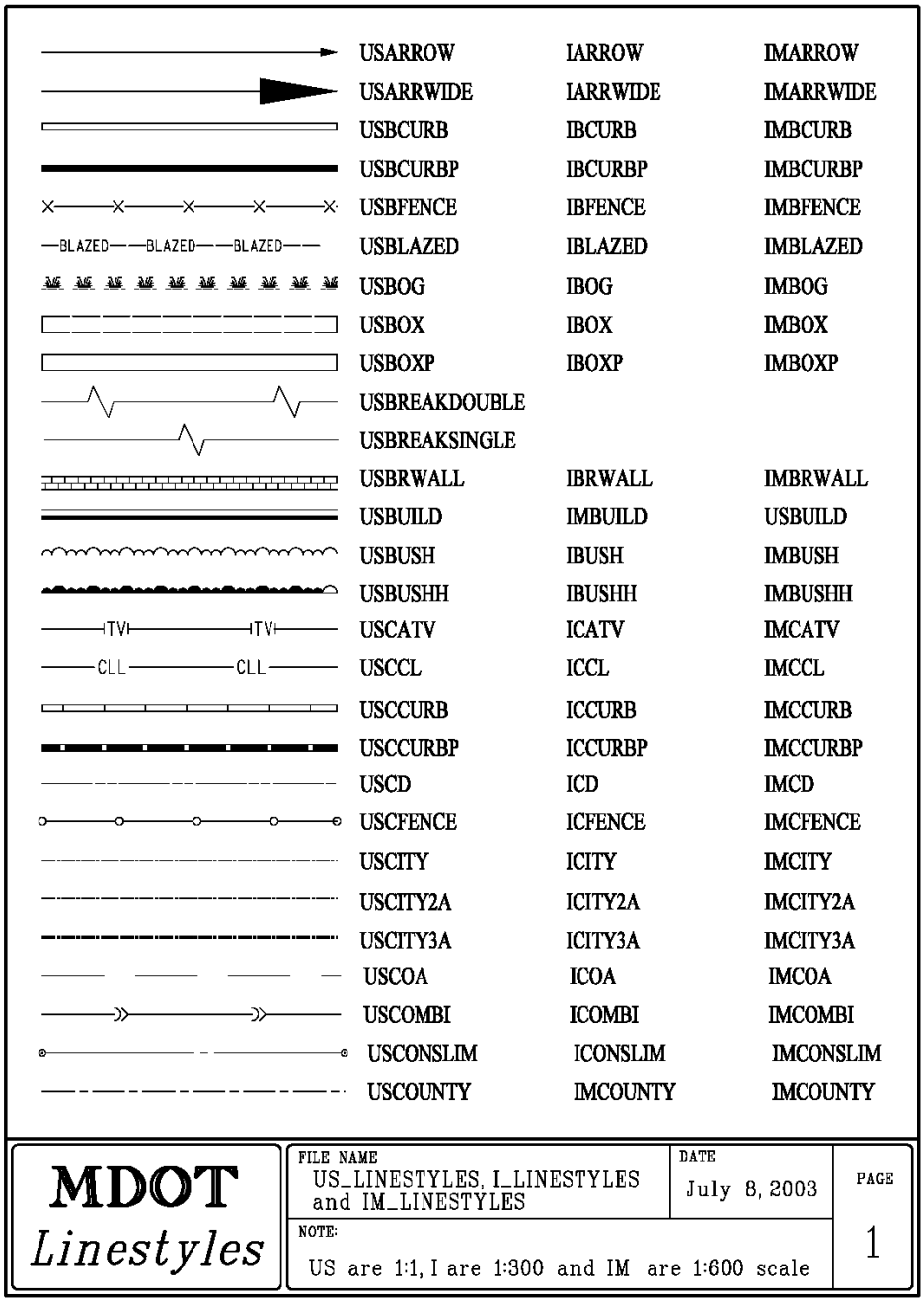
Level Name	Level Number	Level Description
Default	0	
P:TRAV:WAY	1	COLOR-6
P:SHOULDER:PAV_	2	COLOR-253
E:WOOD:BRIDGE-1	3	COLOR-180

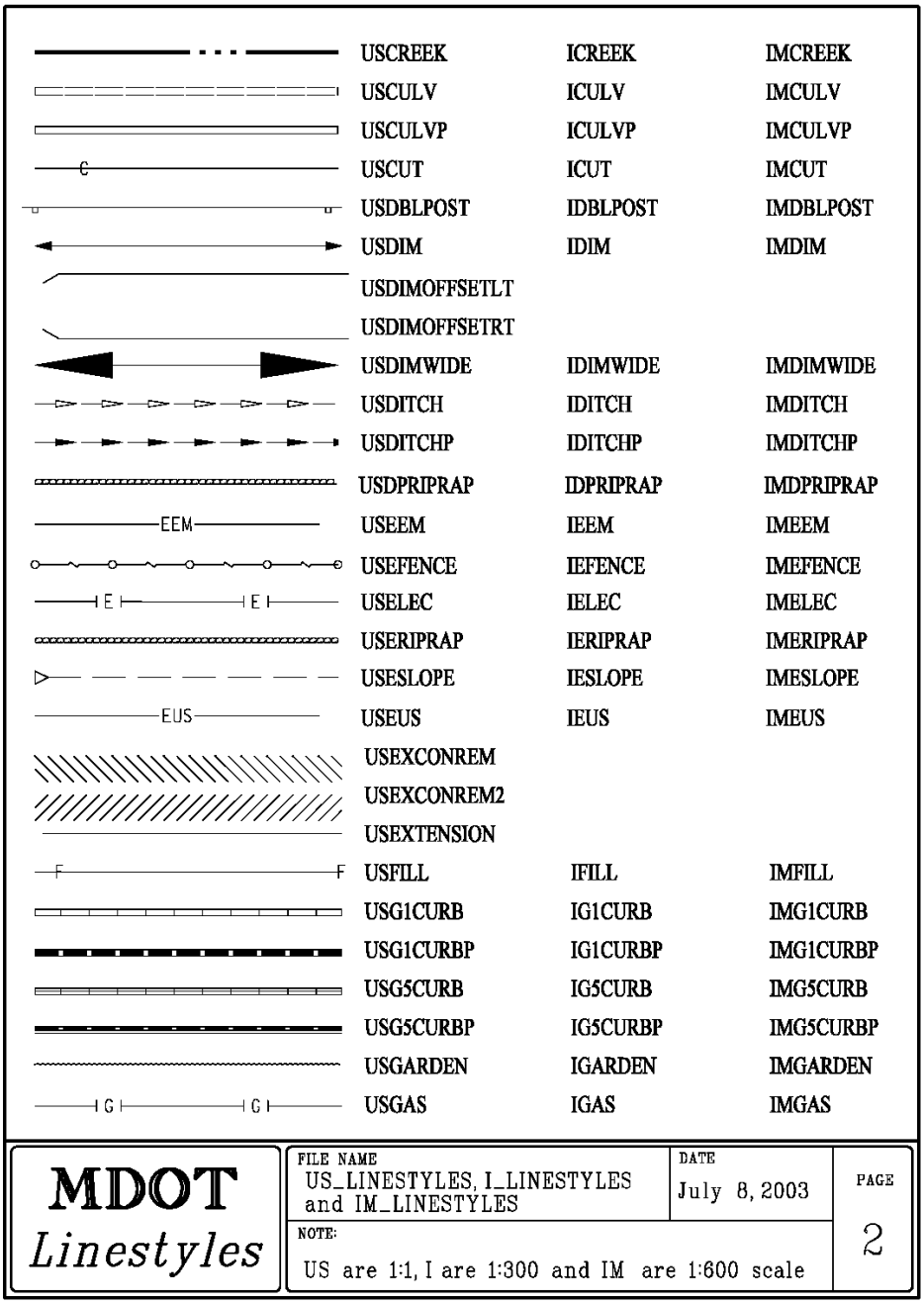
Level Name	Level Number	Level Description
E:WOOD:BRIDGE-2	4	COLOR-181
E:WOOD:BRIDGE-3	5	COLOR-182
P:SHOULDER:GRAV_	6	COLOR-180
P:SIDE:WALK	7	COLOR-19
E:STEEL:BRIDGE-1	8	COLOR-244
E:STEEL:BRIDGE-2	9	COLOR-245
E:STEEL:BRIDGE-3	10	COLOR-246
P:ISLAND:RAISED	11	COLOR-40
P:ISLAND:FLUSH	12	COLOR-229
P:SLOPE-GRASS	13	COLOR-244
Level 14	14	
P:CENTER:LINE	15	COLOR-2
Level 16	16	
TEXT	17	COLOR-1 & VAR.
P:LANE:LINES	18	COLOR-1
DIR_ ARROWS	19	COLOR-1
Level 20	20	
P:STEEL:BRIDGE-1	21	COLOR-240
P:STEEL:BRIDGE-2	22	COLOR-242
P:STEEL:BRIDGE-3	23	COLOR-244
P:WOOD:BRIDGE-1	24	COLOR-176
P:WOOD:BRIDGE-2	25	COLOR-26
P:WOOD:BRIDGE-3	26	COLOR-25
P:CONC:BRIDGE-1	27	COLOR-18
P:CONC:BRIDGE-2	28	COLOR-17
P:CONC:BRIDGE-3	29	COLOR-16
Level 30	30	
Level 31	31	
E:GROUND-1	32	COLOR-115
E:GROUND-2	33	COLOR-116
E:GROUND-3	34	COLOR-117
E:CONC:BRIDGE-1	35	COLOR-20
E:CONC:BRIDGE-2	36	COLOR-21
E:CONC:BRIDGE-3	37	COLOR-22
P:SUB:GRADE-1	38	COLOR-176
P:SUB:GRADE-2	39	COLOR-179
P:SUB:GRADE-3	40	COLOR-180
Level 41	41	
Level 42	42	
E:WATER-1	43	COLOR-151
E:WATER-2	44	COLOR-153
E:WATER-3	45	COLOR-155
E:WATER-4	46	COLOR-156
E:WATER-5	47	COLOR-157
Level 48	48	
Level 49	49	
Level 50	50	
Level 51	51	

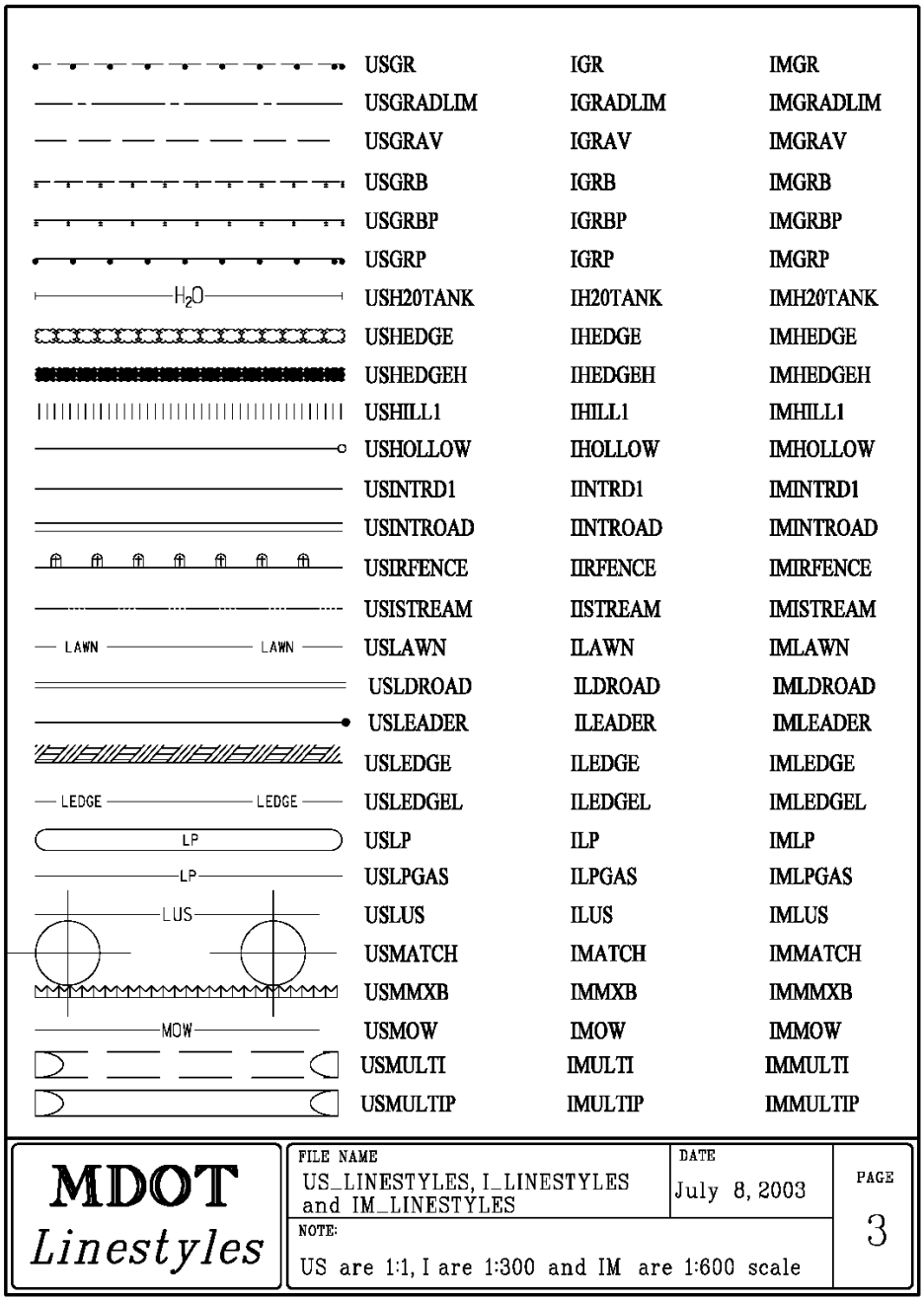
Level Name	Level Number	Level Description
E:CENTER:LINE	52	COLOR-7
E:BRIDGE:DECK	53	COLOR-113
Level 54	54	
Level 55	55	
Level 56	56	
Level 57	57	
Level 58	58	
Level 59	59	
Level 60	60	
Level 61	61	
Level 62	62	
Level 63	63	

LINE STYLES

MDOT STANDARD U.S. CUSTOMARY LINESTYLES




USCREEK ICREEK IMCREEK
USCULV ICULV IMCULV
USCULVP ICULVP IMCULVP
C
USCUT ICUT IMCUT
USDBLPOST IDBLPOST IMDBLPOST
USDIM IDIM IMDIM
USDIMOFFSETLT
USDIMOFFSETRT
USDIMWIDE IDIMWIDE IMDIMWIDE
USDITCH IDITCH IMDITCH
USDITCHP IDITCHP IMDITCHP
USDPRIPRAP IDPRIPRAP IMDPRIPRAP
EEM
USEEM IEEM IMEEM
USEFENCE IEFENCE IMEFENCE
E E
USELEC IELEC IMELEC
USERIPRAP IERIPRAP IMERIPRAP
USESLOPE IESLOPE IMESLOPE
EUS
USEUS IEUS IMEUS
USEXCONREM
USEXCONREM2
USEXTENSION
F F
USFILL IFILL IMFILL
USG1CURB IG1CURB IMG1CURB
USG1CURBP IG1CURBP IMG1CURBP
USG5CURB IG5CURB IMG5CURB
USG5CURBP IG5CURBP IMG5CURBP
USGARDEN IGARDEN IMGARDEN
G G
USGAS IGAS IMGAS
MDOT
Linestyles
FILE NAME
US_LINESTYLES, I_LINESTYLES and IM_LINESTYLES
DATE
July 8, 2003
PAGE
2
NOTE:
US are 1:1, I are 1:300 and IM are 1:600 scale



USGR	IGR	IMGR
USGRADLIM	IGRADLIM	IMGRADLIM
USGRAV	IGRAV	IMGRAV
USGRB	IGRB	IMGRB
USGRBP	IGRBP	IMGRBP
USGRP	IGRP	IMGRP
USH20TANK	IH20TANK	IMH20TANK
USHEDGE	IHEDGE	IMHEDGE
USHEDGEH	IHEDGEH	IMHEDGEH
USHILL1	IHILL1	IMHILL1
USHOLLOW	IHOLLOW	IMHOLLOW
USINTRD1	IINTRD1	IMINTRD1
USINTROAD	IINTROAD	IMINTROAD
USIRFENCE	IIRFENCE	IMIRFENCE
USISTREAM	IISTREAM	IMISTREAM
USLAWN	ILAWN	IMLAWN
USLDROAD	ILDROAD	IMLDROAD
USLEADER	ILEADER	IMLEADER
USLEDGE	ILEDGE	IMLEDGE
USLEDGEL	ILEDGEL	IMLEDGEL
USLP	ILP	IMLP
USLPGAS	ILPGAS	IMLPGAS
USLUS	ILUS	IMLUS
USMATCH	IMATCH	IMMATCH
USMMXB	IMMXB	IMMMXB
USMOW	IMOW	IMMOW
USMULTI	IMULTI	IMMULTI
USMULTIP	IMULTIP	IMMULTIP

MDOT
Linestyles

FILE NAME	DATE	PAGE
US_LINESTYLES, I_LINESTYLES and IM_LINESTYLES	July 8, 2003	3

NOTE:
US are 1:1, I are 1:300 and IM are 1:600 scale

USNATION	INATION	IMNATION
USNATPARK	INATPARK	IMNATPARK
USOTH	IOTH	IMOTH
USPARKL	IPARKL	IMPARKL
USPARKS	IPARKS	IMPARKS
USPAVE	IPAVE	IMPAVE
USPEM	IPEM	IMPEM
USPETRO	IPETRO	IMPETRO
USPETTANK	IPETTANK	IMPETTANK
USPFO	IPFO	IMPFO
USPGFENCE	IPGFENCE	IMPGFENCE
USPICFENC	IPICFENC	IMPICFENC
USPOWER1	IPOWER1	IMPOWER1
USPRFENCE	IPRFENCE	IMPRFENCE
USPRIPRAR	IPRIPRAR	IMPRIPRAR
USPIROAD	IPIROAD	IMPIROAD
USPROPERT	IPROPERT	IMPROPERT
USPSS	IPSS	IMPSS
USRIPRAP	IRIPRAP	IMRIPRAP
USRAILROAD	IRAILROAD	IRAILROAD
USREBARDIM		
USREBAREXT		
USRETWALL	IRETWALL	IMRETWALL
USRETWALLP	IRETWALLP	IMRETWALLP
USROCK		
USROCKCUT		
USRR	IRR	IMRR
USRR2	IRR2	IMRR2

MDOT *Linestyles*

FILE NAME: US_LINESTYLES, I_LINESTYLES and IM_LINESTYLES

DATE: July 8, 2003

PAGE: 4

NOTE: US are 1:1, I are 1:300 and IM are 1:600 scale

USRRABD	IRRABD	IMRRABD
USRRGRADE	IRRGRADE	IMRRGRADE
USRUN	IRUN	IMRUN
USRUS	IRUS	IMRUS
USRW	IRW	IMRW
USRWEP	IRWEP	IMRWEP
USRWP	IRWP	IMRWP
USRWPE	IRWPE	IMRWPE
USRWRR	IRWRR	IMRWRR
USSANI	ISANI	IMSANI
USSANIP	ISANIP	IMSANIP
USSECROAD USSECTION	ISECROAD	IMSECROAD
USSHORE	ISHORE	IMSHORE
USSHORE1	ISHORE1	IMSHORE1
USSHORE2	ISHORE2	IMSHORE2
USSILTF	ISILTF	IMSILTF
USSLOPE	ISLOPE	IMSLOPE
USSQUIGARROW		
USSTATE	ISTATE	IMSTATE
USSTFENCE	ISTFENCE	IMSTFENCE
USSTORM	ISTORM	IMSTORM
USSTORMP	ISTORMP	IMSTORMP
USSTREAM1	ISTREAM1	IMSTREAM1
USSTREAM2	ISTREAM2	IMSTREAM2
USSTWALL	ISTWALL	IMSTWALL
USSTWALLM	ISTWALLM	IMSTWALLM
USTANK	ITANK	IMTANK

MDOT *Linestyles*

FILE NAME: US_LINESTYLES, I_LINESTYLES and IM_LINESTYLES

DATE: July 8, 2003

PAGE: 5

NOTE: US are 1:1, I are 1:300 and IM are 1:600 scale

USTELE	ITELE	IMTELE
USTOWN	ITOWN	IMTOWN
USTRAV	ITRAV	IMTRAV
USTREE	ITREE	IMTREE
USTREEH	ITREEH	IMTREEH
USTW	ITW	IMTW
USWTROAD	IWTROAD	IMWTROAD
USUNINVRD	IUNINVRD	IMUNINVRD
USUNROAD	IUNROAD	IMUNROAD
USURBAN	IURBAN	IMURBAN
USVERNALPL	IVERNALPL	IMVERNALPL
USVINE	IVINE	IMVINE
USWATER	IWATER	IMWATER
USWETF	IWETF	IMWETF
USWETLAND	IWETLAND	IMWETLAND
USWETS	IWETS	IMWETS
USWLANDF1	IWLANDF1	IMWLANDF1
USWLANDF2	IWLANDF2	IMWLANDF2
USWLANDF3	IWLANDF3	IMWLANDF3
USWLANDS1	IWLANDS1	IMWLANDS1
USWLANDS2	IWLANDS2	IMWLANDS2
USWLANDS3	IWLANDS3	IMWLANDS3
USWP	IWP	IMWP

MDOT *Linestyles*

FILE NAME: US_LINESTYLES, I_LINESTYLES and IM_LINESTYLES

DATE: July 8, 2003

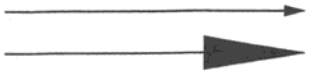
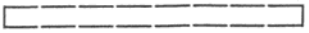
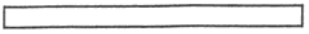
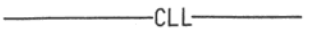
PAGE: 6

NOTE: US are 1:1, I are 1:300 and IM are 1:600 scale

MDOT STANDARD METRIC CUSTOM LINESTYLES

MDOT Line Styles	FILE LOCATION Mstaconf & !msjconf	DATE 2-23-00	As Notes SCALE
	FILE NAME mdotlinestyle, j_mdotstyles, k_mdotstyles, l_mdotstyles, l_mdotstyles_environ, m_mdotstyles, m_mdotstyles_environ, mapping_met and rwstyles		1 PAGE
	NOTE:		

Names and Scale

	1:1	1:50	1:250	1:500
	ARROW,JARROW	KARROW	LARROW	
	ARRWIDE,JARRWIDE	KARRWIDE	LARRWIDE	
	BCURB		LBCURB	MBCURB
	BCURBP		LBCURBP	MBCURBP
	BFENCE		LBFENCE	MBFENCE
	BOG,LBOG			
	BOX		LBOX	MBOX
	BOXP		LBOXP	MBOXP
	BREAK,JBREAK	KBREAK		
	BRWALL		LBRWALL	MBRWALL
	BUILD		LBUILD	MBUILD
	BUSH		LBUSH	MBUSH
	BUSHH		LBUSHH	MBUSHH
	CATV		LCATV	MCATV
	CCL		LCCL	MCCL
	CCURB		LCCURB	MCCURB
	CCURBP		LCCURBP	MCCURBP
	CD		LCD	MCD
	CEMETERY		LIRFENCE	MIRFENCE
	CFENCE		LCFENCE	MCFENCE
	CITY,LCITY			
	CITY2A,LCITY2			
	CITY3A,LCITY3			
	COA		LCOA	MCOA
	COMBI		LCOMBI	MCOMBI
	CONSLIM		LCONSLIM	MCONSLIM
	COUNTY,LCOUNTY			
	CREEK		LCREEK	MCREEK
	CULV		LCULV	MCULV
	CULVP		LCULVP	MCULVP
	CUT		LCUT	MCUT
	DBLPOST		LDBLPOST	MDBLPOST
	DIM,JDIM	KDIM	LDIM	MDIM
	DIMWIDE,JDIMWIDE	KDIMWIDE	LDIMWIDE	MDIMWIDE
	DITCH		LDITCH	MDITCH
	DITCHP		LDITCHP	MDITCHP

Names and Scale

	1:1	1:50	1:250	1:500
EEM	EEM		LEEM	MEEM
	EFENCE		LEFENCE	MEFENCE
E E	ELEC		LELEC	MELEC
EUS	EUS		LEUS	MEUS
	ESLOPE		LFSLOPE	MFSLOPE
F	FILL		LFILL	MFILL
	GICURB		LGICURB	MGICURB
	GICURBP		LGICURBP	MGICURBP
	G5CURB		LG5CURB	MG5CURB
	G5CURBP		LG5CURBP	MG5CURBP
	GARDEN		LGARDEN	MGARDEN
G G	GAS		LGAS	MGAS
	GR		LGR	MGR
	GRADLIM		LGRADLIM	MGRADLIM
	GRAV		LGRAV	MGRAV
	GRB		LGRB	MGRB
	GRBP		LGRBP	MGRBP
	GRP		LGRP	MGRP
H_2O	H2OTANK		LH2OTANK	MH2OTANK
	HEDGE		LHEDGE	MHEDGE
	HILLI,LHILLI			
	INTRDI,LINTRDI			
	INTROAD,LINTROAD			
	ISTREAM,LISTREAM			
LAWN	LAWN		LLLAWN	MLAWN
	LDROAD,LLDROAD			
	LEADER,JLEADER	KLEADER		
	LEDGE		LLEDGE	MLEDGE
LEDGE	LEDGEL		LLEDGEL	MLEDGEL
LP	LPGAS		LLPGAS	MLPGAS
LUS	LUS		LLUS	MLUS
MOW	MOW		LMOW	MMOW
	MULTI		LMULTI	MMULTI
	MULTIP		LMULTIP	MMULTIP
	NATION,LNATION			

Names and Scale

	1:1	1:50	1:250	1:500
	NATPARK,LNATPARK			
OTH	OTH		LOTH	MOTH
	PARKL,LPARKL			
	PARKS,LPARKS			
	PAVE		LPAVE	MPAVE
PEM	PEM		LPEM	MPEM
PI PI	PETRO		LPETRO	MPETRO
PETRO	PETTANK		LPETTANK	MPETTANK
PFO	PFO		LPFO	MPFO
	PGFENCE		LPGFENCE	MPGFENCE
	PICFENC		LPICFENC	MPICFENC
	POWERI,LPOWERI			
	PRFENCE		MPRFENCE	MPRFENCE
	PRIROAQD,LPRIROAD			
	PROPERT		LPROPERT	MPROPERT
PSS	PSS		LPSS	MPSS
	RAILROAD		LRAILROAD	MRAILROAD
	RETWALL		LRETWALL	MRETWALL
	RETWALP		LRETWALP	MRETWALP
	RIPRAP,ERIPRAP		LERIPRAP	MERIPRAP
	PRIPRAP		LPRIPRAP	MPRIPRAP
	ROCK,JROCK	KROCK		
	ROCKCUT,JROCKCUT	KROCKCUT		
	RR,LRR			
	RR2,LRR2			
	RRABD,LRRABD			
	RRGRADE,LRRGRADE			
	RUN		LRUN	MRUN
RUS	RUS		LRUS	MRUS
	RW		LRW	MRW
	RWEP		LRWEP	MRWEP
	RWP		LRWP	MRWP
	RWPE		LRWPE	MRWPE
	RWRR		LRWRR	MRWRR
	SANI		LSANI	MSANI
	SANIP		LSANIP	MSANIP

Names and Scale

	1:1	1:50	1:250	1:500
	SECROAD,LSECROAD			
	SHORE		LSHORE	MSHORE
	SHOREI,LSHOREI			
	SHORE2,LSHORE2			
	SILTF		LSILTF	MSILTF
	SLOPE		LSLOPE	MSLOPE
	STATE,LSTATE			
	STFENCE		LSTFENCE	MSTFENCE
	STORM		LSTORM	MSTORM
	STORMP		LSTORMP	MSTORMP
	STREAMI,LSTREAMI			
	STREAM2,LSTREAM2			
	STWALL		LSTWALL	MSTWALL
	STWALLM		LSTWALLM	MSTWALLM
	TELE		LTELE	MTELE
	TOWN,LTOWN			
	TRAV		LTRAV	MTRAV
	TREE		LTREE	MTREE
	TREEH		LTREEH	
	TW		LTW	MTW
	TWROAD,LTWOROAD			
	UNINVRD,LUNIVRD			
	UNROAD,LUNROAD			
	URBAN,LURBAN			
	VINE		LVINE	MVINE
	WATER		LWATER	MWATER
	WETF		LWETF	MWETF
	WETLAND		LWETS	MWETS
	WETS		LWETLAND	MWETLAND
	WLANDF1		LWLANDF1	MWLANDF1
	WLANDF2		LWLANDF2	MWLANDF2
	WLANDF3		LWLANDF3	MWLANDF3
	WLANDSI		LWLANDSI	MWLANDSI
	WLANDS2		LWLANDS2	MWLANDS2
	WLANDS3		LWLANDS3	MWLANDS3
	WP		LWP	MWP

STRUCTURAL LINESTYLES

Samples

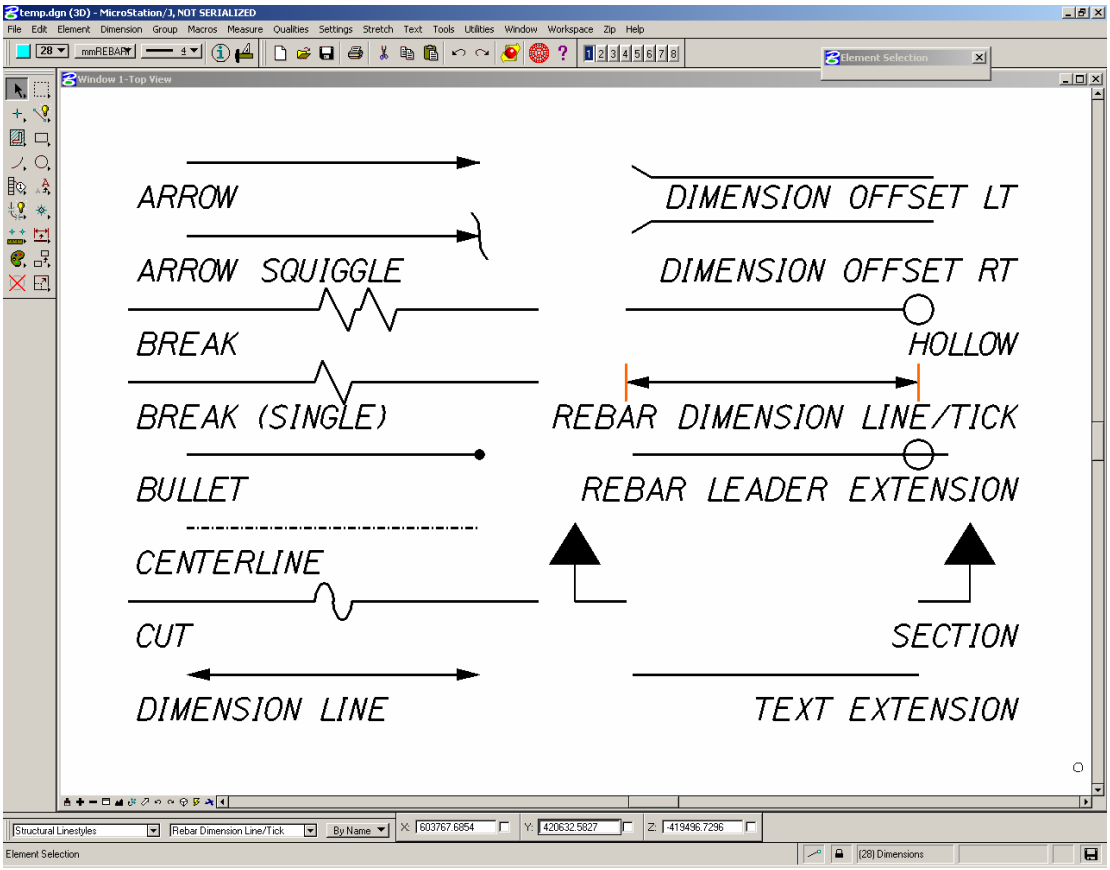


Figure 16-1: Structural Linestyles

Using Custom Linestyles

Linestyles are activated from the **Settings Manager**, **Structural Linestyles** group (Figure 16-2).

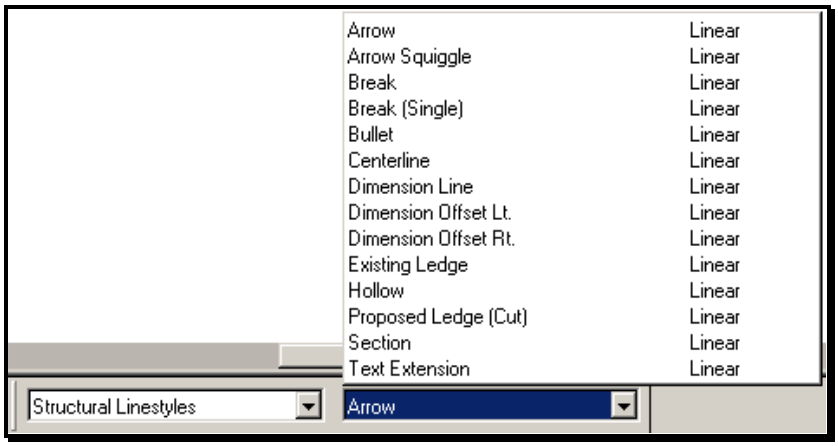


Figure 16-2: Structural Linestyle Options

Line styles are scale-dependent. Make sure you select the appropriate scale from the **Settings Manager** (by right-clicking and choosing **Category > Scale** from the **Settings Manger**) before you make a line style selection.

Tweaking Line style Size

Sometimes your lines are going to show up either bigger or smaller than you'd like them to be. The Break and Cut line styles are most likely going to be the culprits here -- you may want to squeeze a break line into a small area.

Go through the routine outlined above as a starting point. If the Break line is too big for example, select **Element>Line Style>Custom** from the *Main Menu.*

This will open up the **Line Styles** dialog (Figure 16-3).

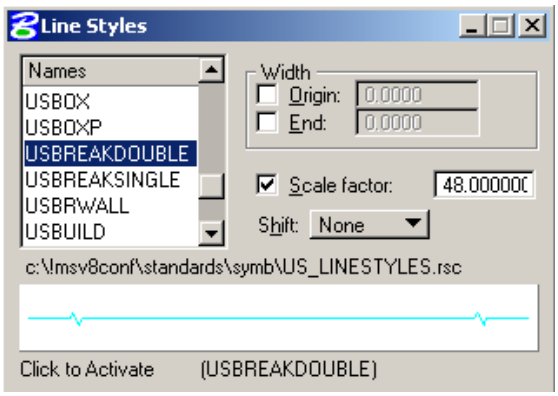


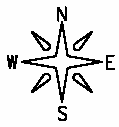
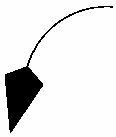
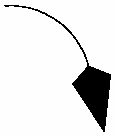
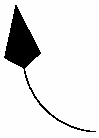
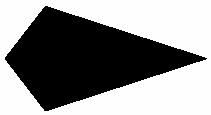
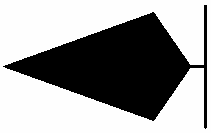
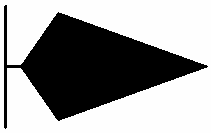
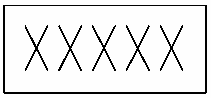
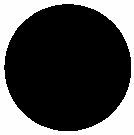
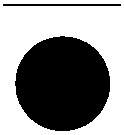
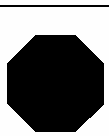
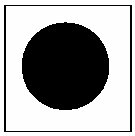
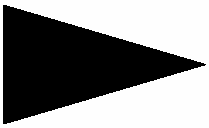
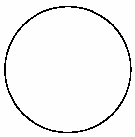
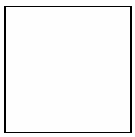
Figure 16-3: Line Styles Dialog

Note that there is an on/off switch labeled **Scale Factor:** followed by a text field. This is the scale, as determined by the **Settings Manager**, to place your line style.

- If you want your line style, to be smaller, edit the number in the **Scale Factor** text field. If it is currently 48, changing it to 24 will make it smaller (half as big) and changing it to 96 will make it bigger (twice as big.)

CELL LIBRARIES

Cell Library: Accid2d.cel

ACNARW 	ARDL40	ARDL80 	ARDR40
ARDR80 	ARUL40	ARUL80	ARUR40
ARUR80 	BSCARW 	BTARWL 	BTDARW 
NODEBX 	POLE 	SIGN 	SSHWAV
STOPSN 	TLIGHT 	TRMNTR 	TRMOPN
TXTCRC 	TXTSQR 		

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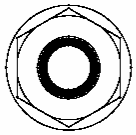
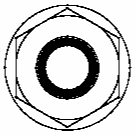
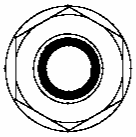
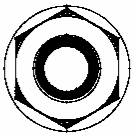
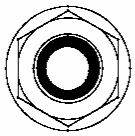
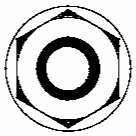
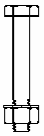
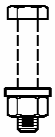
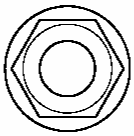
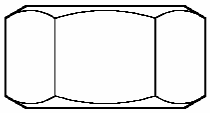
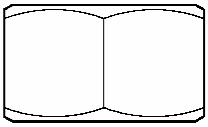
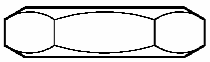
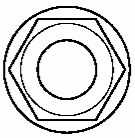
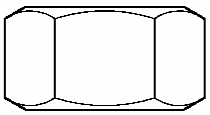
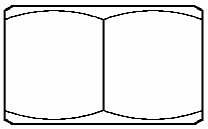
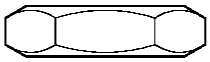
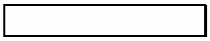
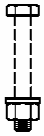
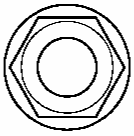
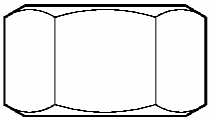
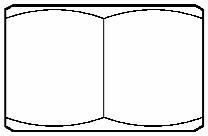
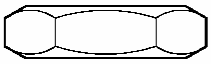
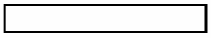
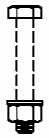
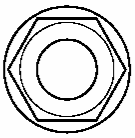
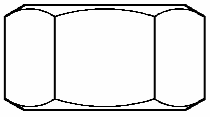
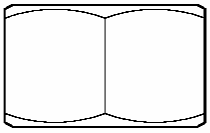
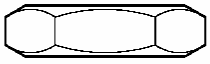
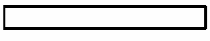
BWN3d.5I 	BWN3d.625I 	BWN3d.75I 	BWN3d.875I 
BWN3dIJ25I 	BWN3d.25I	BWN3dII 	Bolt Section 
MI2BLT 	MI2END 	MI2HNA 	MI2HNB 
MI2JN 	MI2W	MI4BLT	MI4END 
MI4HNA 	MI4HNB 	MI4JN 	MI4W 
MI6BLT 	MI6END 	MI6HNA 	MI6HNB 
MI6JN 	MI6W 	M20BLT 	M20END 
M20HNA 	M20HNB 	M20JN 	M20W 

Page 1

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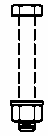
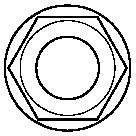
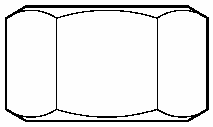
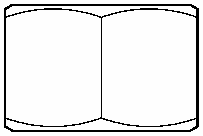
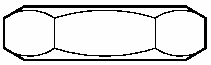
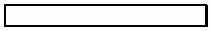
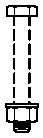
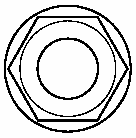
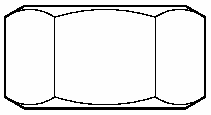
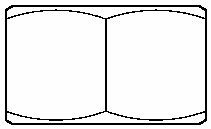
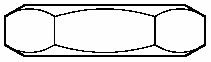
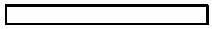
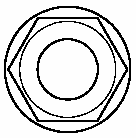
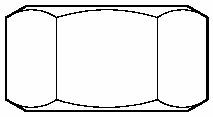
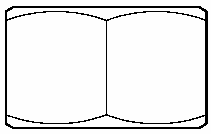
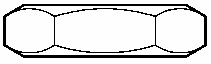
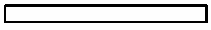
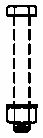
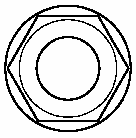
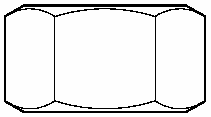
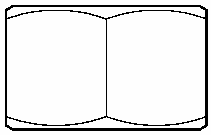
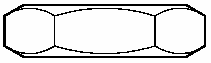
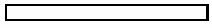
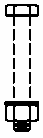
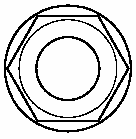
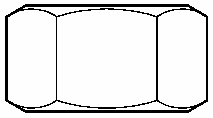
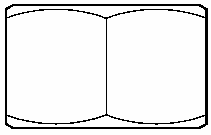
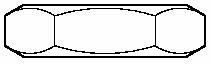
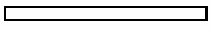
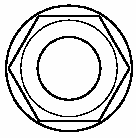
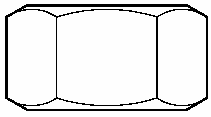
M22BLT 	M22END 	M22HNA 	M22HNB 
M22JN 	M22W 	M24BLT 	M24END 
M24HNA 	M24HNB 	M24JN 	M24W 
M27BLT	M27END 	M27HNA 	M27HNB 
M27JN 	M27W 	M30BLT 	M30END 
M30HNA 	M30HNB 	M30JN 	M30W 
M36BLT 	M36END 	M36HNA 	M36HNB 
M36JN 	M36W 	M42END 	M42HNA 

Page 2

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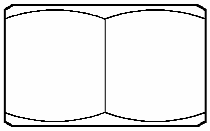
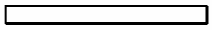
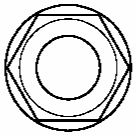
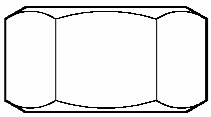
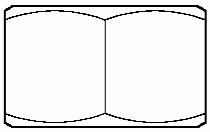
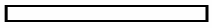
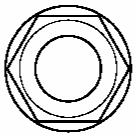
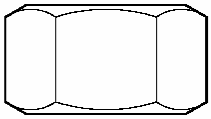
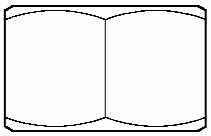
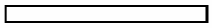
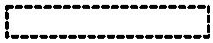
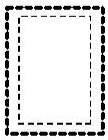
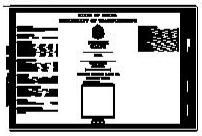
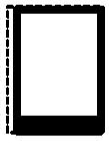
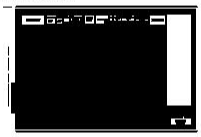
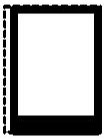
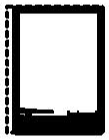
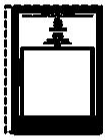
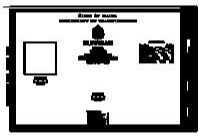
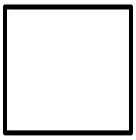
M42HNB 	M42W 	M48END 	M48HNA 
M48HNB 	M48W 	M56END 	M56HNA 
M56HNB 	M56W 		

Page 3

Cell Library: Border.cel

10FT	15FT	20FT 	5FT
BDGBORDER 	BORDER	BORDERSC	BRGTITLE 
CL8XII	CLP2	CONOTE	CSTBRD 
DOTADD	DRAINAGE 	EN8XII 	ENVLAY 
ENVTITLE 	ESTIMATE	HWYTITLE 	LMAPBD 
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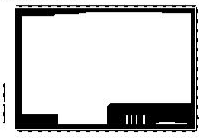
REBAR	RWBORD	RWBORDDT 	RWCLP2

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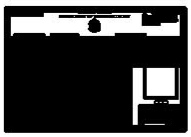
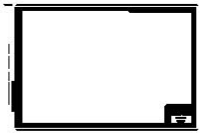
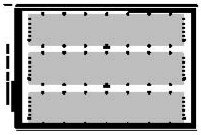
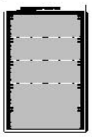
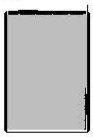
RWCOORD 	STDDTL	TYPICAL 	XSECTH 
XSECTHF	XSECTION	XSECTV 	XSECTVF 

Page 2

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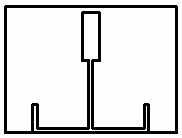
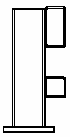
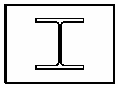
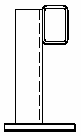
ARP 	BR2T 	BR4TB	BR4TP
BRBASE 	BRBMB	BRBMP 	BRTRI
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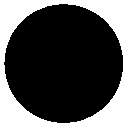
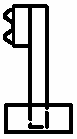
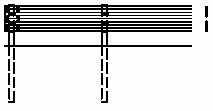
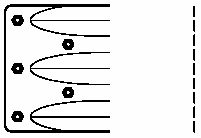
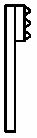
CLBGP2 ℄ Brg., Pier No. 2	CLBGP3 ℄ Brg., Pier No. 3	CLBGP4 ℄ Brg., Pier No. 4	CLBGP5 ℄ Brg., Pier No. 5
CLCON ℄ Const.	CLCONS ℄ Construction	CLPR1 ℄ Pier No. 1	CLPR2 ℄ Pier No. 2
CLPR3 ℄ Pier No. 3	CLPR4 ℄ Pier No. 4	CLPR5 ℄ Pier No. 5	CLPR6 ℄ Pier No. 6
CLPR7 ℄ Pier No. 7	CLPR8 ℄ Pier No. 8	DIMDOT 	DOWEL
GRCONC 	GRTBPL 	GRTC 	GRTSEC 

Page 1

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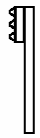
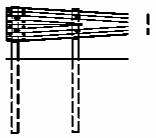
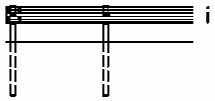
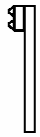
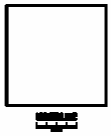
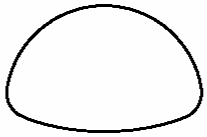
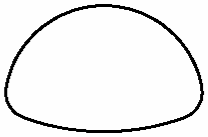
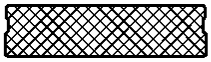
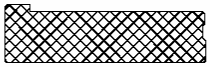
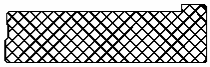
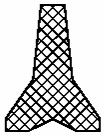
GRTSRT 	GRTWT 	GRWBPL 	GRWSEC
GRWSRT 	LOCMAP 	PI74 	PI85 
PCI2X3 	PCB3A	PCEI23 	PCERT 
TCBSEC 	TICK5	TICK50	

Page 2

Cell Library: BridgeStNotes.cel

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SNELBR	SNGENC	SNHYDF	SNHYDP
SNMATR	SNMOTR	SNPIER	SNPILE
SNPREC	SNSPEC	SNSTL	SNSTPL
SNSUP	SNTRAF	SNTWAL	SNUTIL

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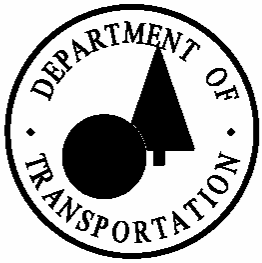
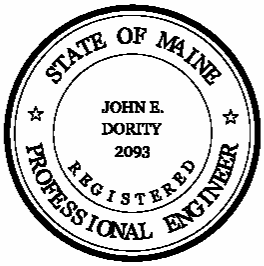
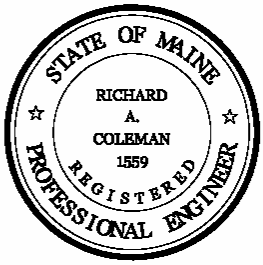
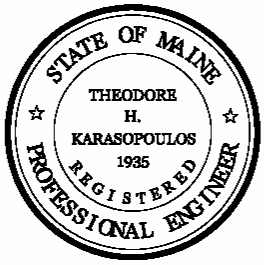
Cell Name: LOGOCA	Cell Name: LOGODE 
Cell Name: RWSJD 	Cell Name: RWSRC 
Cell Name: RWSTK 	

Page 1

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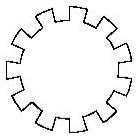
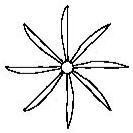
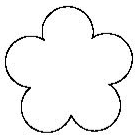
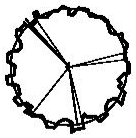
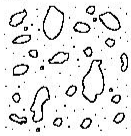
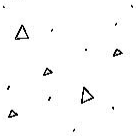
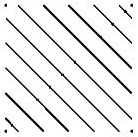
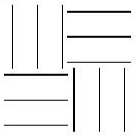
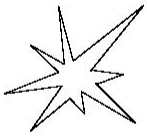
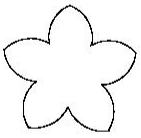
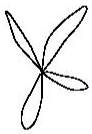
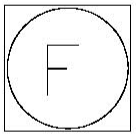
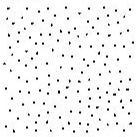
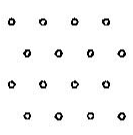
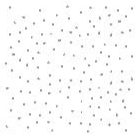
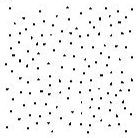
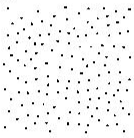
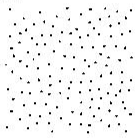
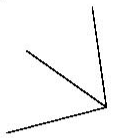
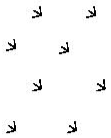
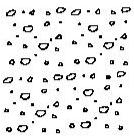
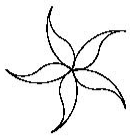
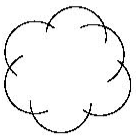
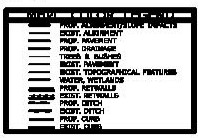
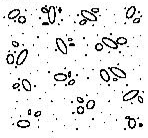
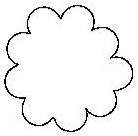
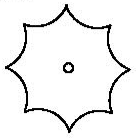
ARBVIT 	ASH 	BEECH 	BIRCH 
COBOLD 	CONCRT 	DTDSHT 	EARTH 
FIR 	FLCRAB 	FORSYT 	FOUNTN 
FPDNSM 	FPSPR2	FPSPR5	FPSPR7
FPSPRB	FZHXPT 	GRI2SP 	GRI4SP
GRI7SP 	GRI9SP 	GR2ISP 	GRASS 
GRASSP 	GRAVL 	LINDEN 	MAPLE 
MHPC 	MTPBSN 	OAK 	ORNCND 

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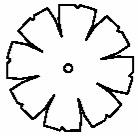
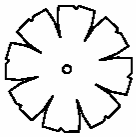
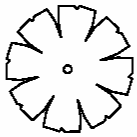
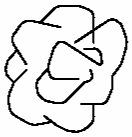
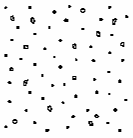
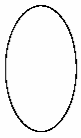
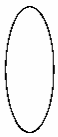
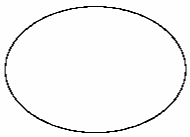
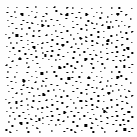
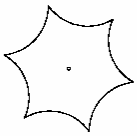
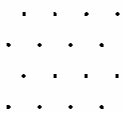
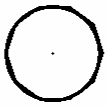
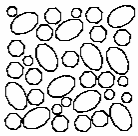
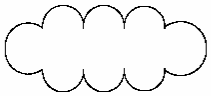
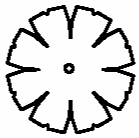
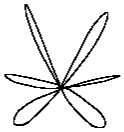
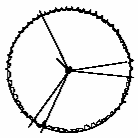
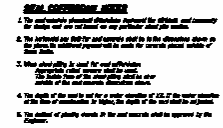
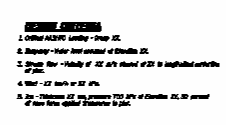
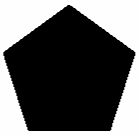
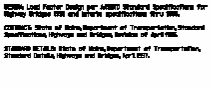
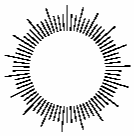
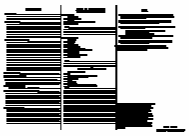
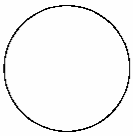
ORNCNL	ORNCNM	ORNCNS	ORNDCL 
ORNDCM 	ORNDCS 	ORNPER 	ORSHRD
PBEDRP	PBEDUG	PBGRVL 	PBLBIG 
PBLMED 	PBLSML 	PBSAND 	PBUSH
PINE 	PKADFP 	POPLAR 	POROUS 
PRIVET 	PTREE 	RHODOD 	ROSE 
SNCOFF 	SNDESG 	SNDGRC 	SNGENC
SPECS 	SPRUCE 	STCNPL 	STNCRC 

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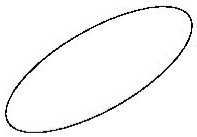
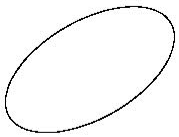
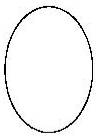
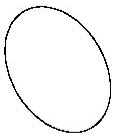
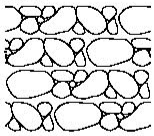
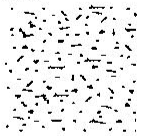
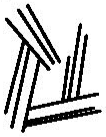
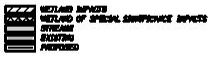
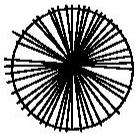
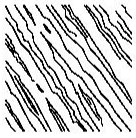
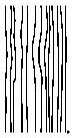
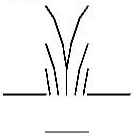
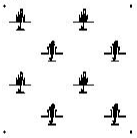
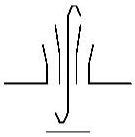
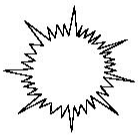
STNLOV 	STNMOV 	STNNCR 	STNOVL 
STNWAL 	STONWL	STSND2 	WDWST1 
WDWST2	WETKEY 	WILLOW 	WOODI 
WOOD2 	WTLFRP	WTLFRS 	WTLSLP 
WTLSLT 	YEW 		

Page 3

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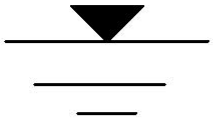
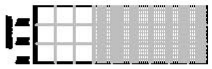
10FTCR	5FTCR	ARTPRS 	BDA3IB
BDA3IT	BDA3MB 	BDA3MT	BLCNTA
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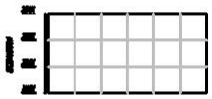
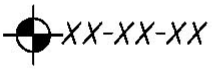
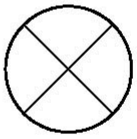
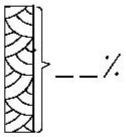
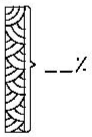
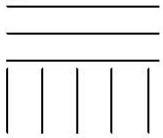
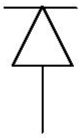
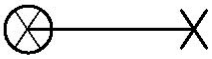
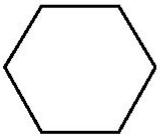
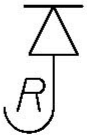
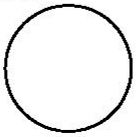
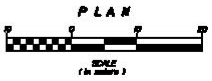
BRNRFL	DRSIMB 	DRSIMT	DRSMTB
DRSMTT	FSNOTE	HMBORING 	HNDAGR 
LDGCRI 	LDGCR5 	LEDOC 	NOREF 
PAWT(PLAN)	PLSLQL 	PWRAGR 	REF 
RODSND 	SCPLM2 	SCPR24	SCPR48

Page 1

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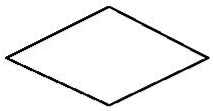
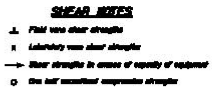
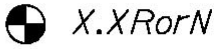
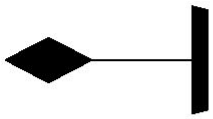
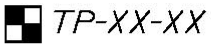
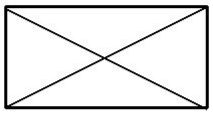
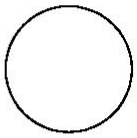
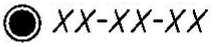
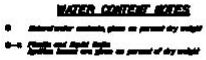
SCPRM2	SEISHT 	SHRNOT 	SHSTEX
SSABORING 	SSHOT 	TPBORING 	TSTPIT 
VNFLDT	VNLBTS	VNSHFL 	WBTOP
WSHBRN 	WTCTNT 		

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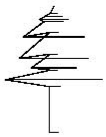
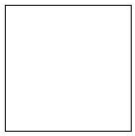
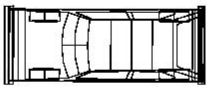
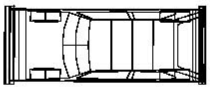
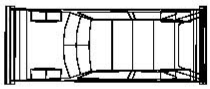
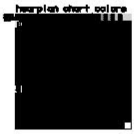
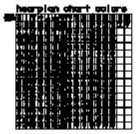
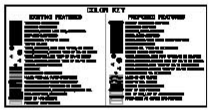
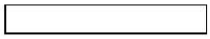
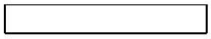
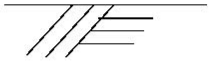
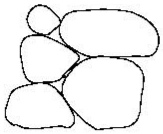
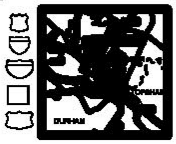
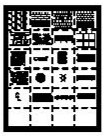
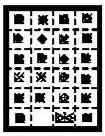
3D 	3DMAN	3DMAN2	AERIAL
AIR 	ALL	BKEY	BORDER
BUSH	CAR1 	CAR2 	CAR3 
CHART 	CHART2	CHART3 	COLKEY 
DIRIGO	DOT	FROAD FROGGY:/1 1:1	GUIDE1 
GUIDE2 	ICON	LEDGE	LEDGE2 
LEDGE3 	LOCMAP	LODMAP	LOGO
MAP 	MAPS	MAT 	MATF 

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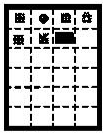
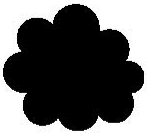
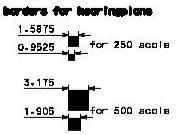
MATF2 	MICRO **Micro Station Presents**	NEW 	NOTE 
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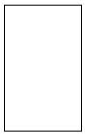
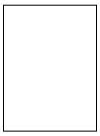
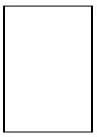
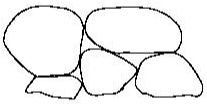
PROF	PROF1	REC 	REC2 
REC3 	RIPRAP	ROCKS 	SCALE
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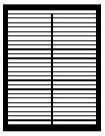
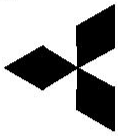
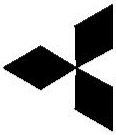
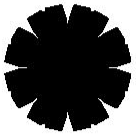
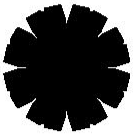
TEST2	TITLEB 	TRBUC	TRCCNP 
TRCCP 	TRDCNP 	TRDCP 	TYP
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Page 2

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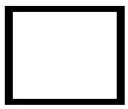
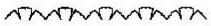
USTATE 	USW	WETI	WMILL
WOODS 	ZALL	ZPLAN	ZPROF
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Page 3

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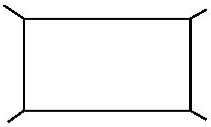
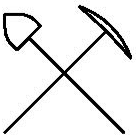
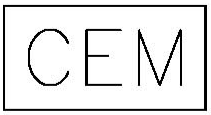
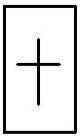
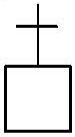
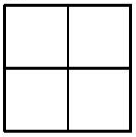
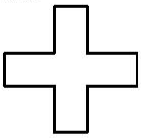
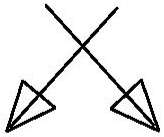
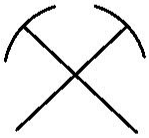
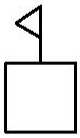
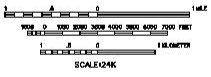
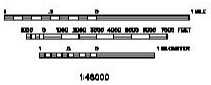
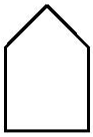
BRSYMB 	BRWPIT 	CEMLRG 	CEMSML 
CHURCH 	FIREST 	HSPTAL 	PIT 
POLICE	QUARRY 	SCHOOL 	SCL24K 
SCL48K 	SCTL2K	SCTL2M	SWAMP
TWNHAL 			

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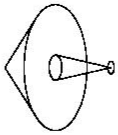
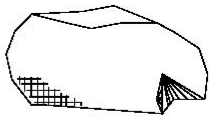
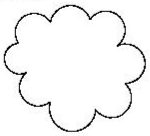
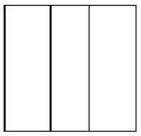
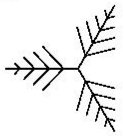
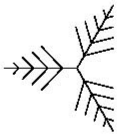
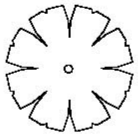
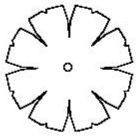
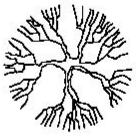
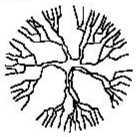
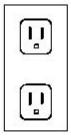
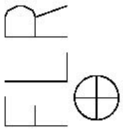
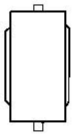
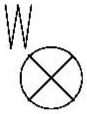
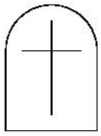
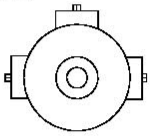
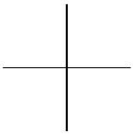
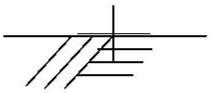
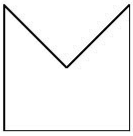
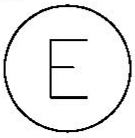
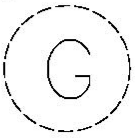
ALARMX	ANTWDX 	BNCHMK	BOULDR 
BUSHES 	CB 	CBPROP	CONNOP 
CONPAY 	DECTNP 	DECTRP 	DEDTNP 
DEDTRP 	DROUTX	DRPINB	DRPINX
ELCTOT 	FILCAP 	GASPMX 	GATEGS
GATEWT 	GRAVE 	GUYANC	HYDRNT 
INVERT 	IRONPN	LEDGSH 	MAILBX 
MASTRX	MHELCP 	MHELCT	MHGAS 

Page 1

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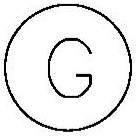
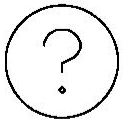
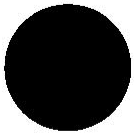
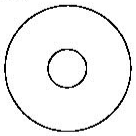
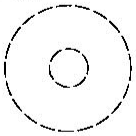
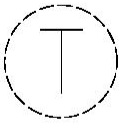
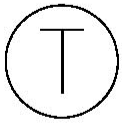
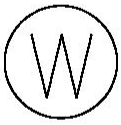
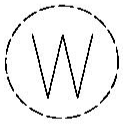
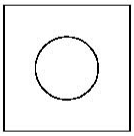
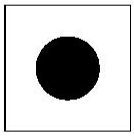
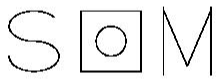
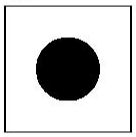
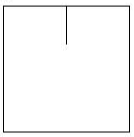
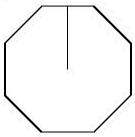
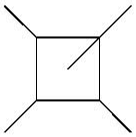
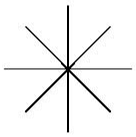
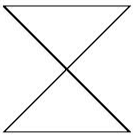
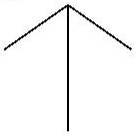
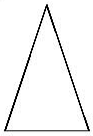
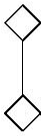
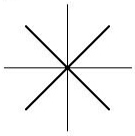
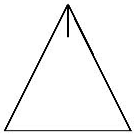
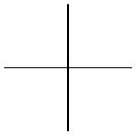
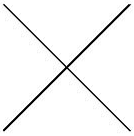
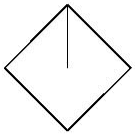
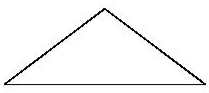
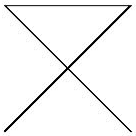
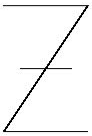
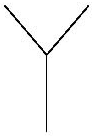
MHGASP 	MHOTHP 	MHOTHR	MHSANP 
MHSANT 	MHSTRM 	MHTELE 	MHTELP 
MHWATP 	MHWATR 	MNMNTC 	MNMTRW 
MNMTSR 	MNMTST 	MSL_0 	MSL_1 
MSL_10 	MSL_11 	MSL_12 	MSL_13
MSL_14 	MSL_15 	MSL_16 	MSL_17 
MSL_2 	MSL_3 	MSL_4 	MSL_5 
MSL_6 	MSL_7 	MSL_8 	MSL_9 

Page 2

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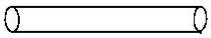
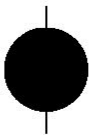
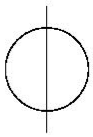
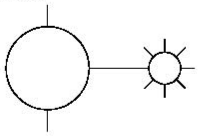
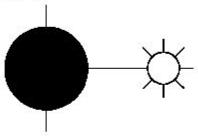
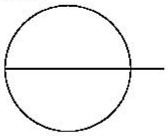
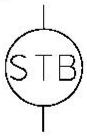
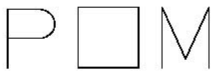
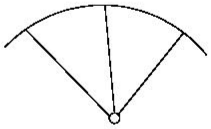
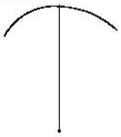
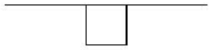
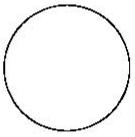
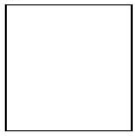
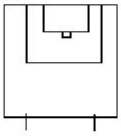
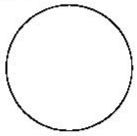
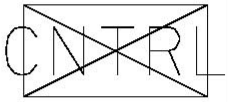
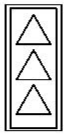
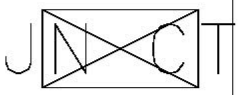
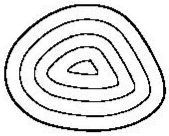
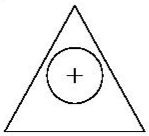
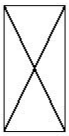
POLBRC 	POLFLG	POLGNP 	POLGNX 
POLLIT 	POLLTP 	POLSPR 	POLSTB 
POLTRF	PRJMKR 	RARPLN	RARSHR 
RARTRE 	RODAGR	RRSGNL	RRSWIT
RRXING	SGNSGL 	SILLS	STPOST 
TANKSP 	TELEBT 	TESTPT 	TRCTRL 
TREERT	TRFSGX 	TRJNCT 	TRSTMP 
TRTP 	UTLTWX 	VENPIP	WELLSX

Page 3

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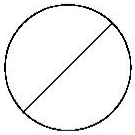
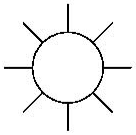
WSHTOX 	YRDLGT 		

Page 4

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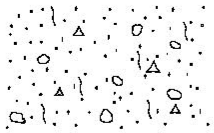
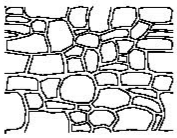
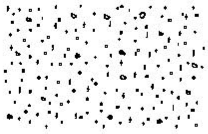
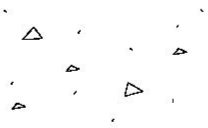
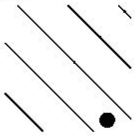
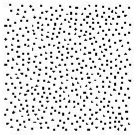
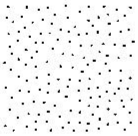
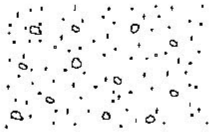
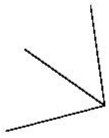
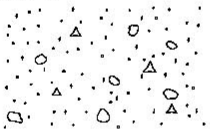
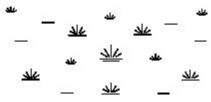
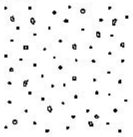
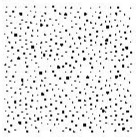
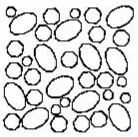
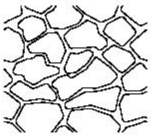
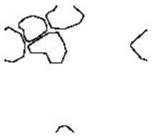
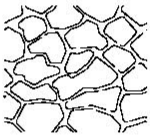
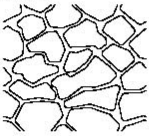
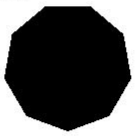
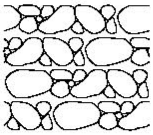
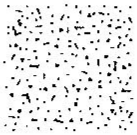
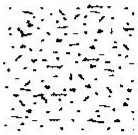
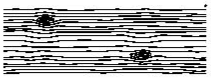
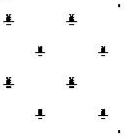
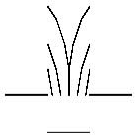
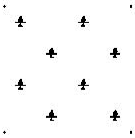
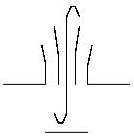
AGGREGATE 	CLFENCE	COBBLE 	COBOLD
COMMON 	CONCRETE 	DTDSHP 	FNSAN2 
FNSAND 	GRANULAR 	GRASS 	GRASSP
GRAVEL 	HSWAMP 	PBGRVL 	PBSAND 
POROUS 	RIPRAPP 	RIPRAPPL 	RIPRAPSE 
RIPRAPSP 	SNDGRC	SNDGRN 	STEEL
STNWAL 	STONWL	STSAND 	STSND2 
TICK25FT	TICK50FT	WOOD 	WTLFRP 

Cell Library: PATTERN.CEL

WTLFRS 	WTLSLP 	WTLSLT 	

Page 2

Cell Library: PLAN.cel

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50FTIC	5MTIC	60FTIC	BUSHN
CLUS100	CLUS50	CPTBOX	CRVBOX
CTRLPT	FLOWL	FLOWR	LVGR
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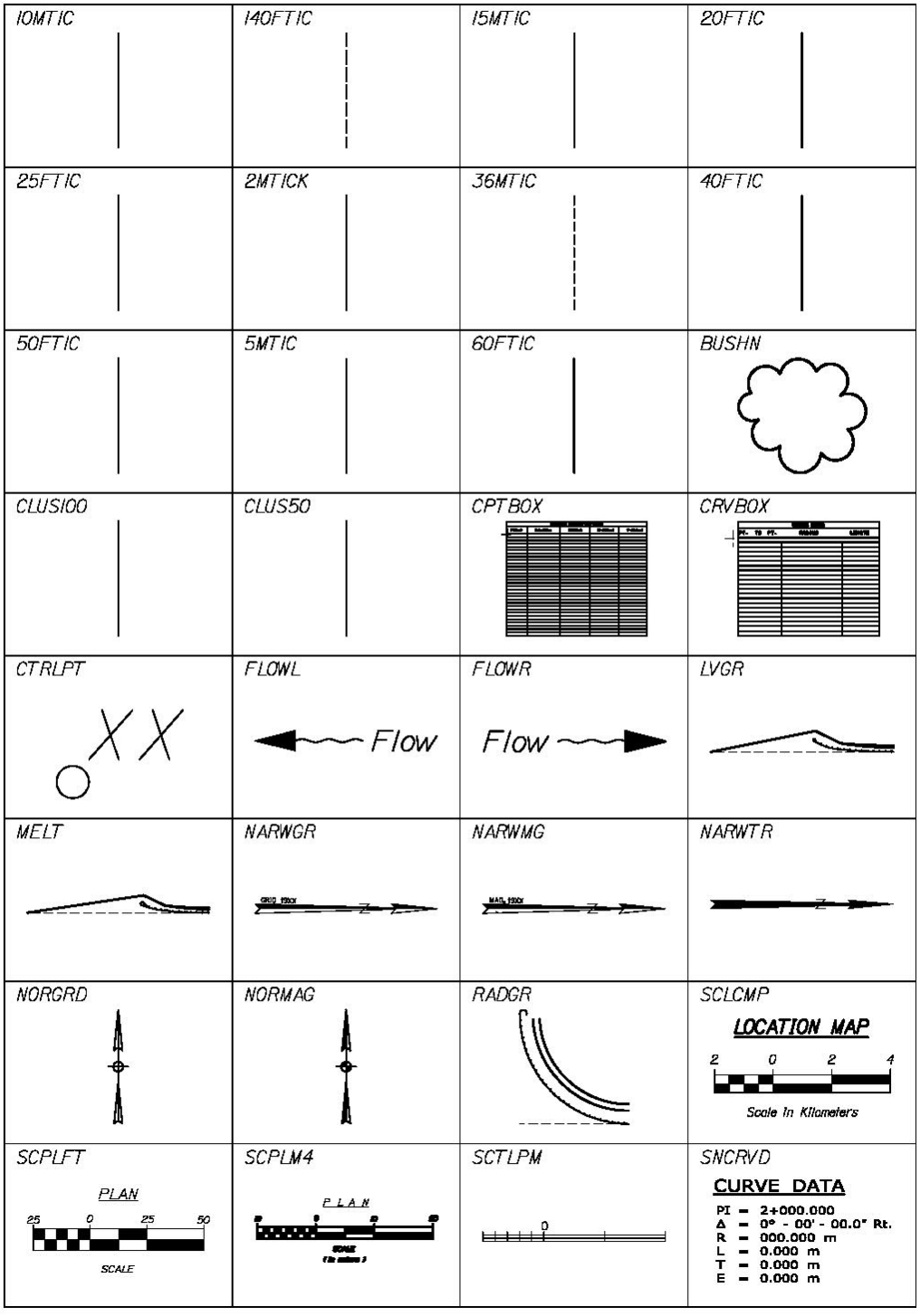

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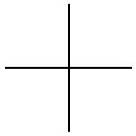
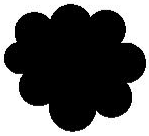
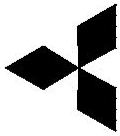
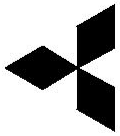
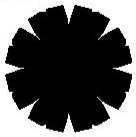
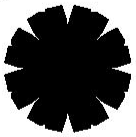
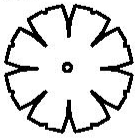
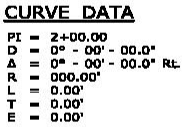
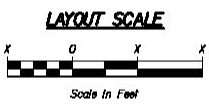
TICK 	TRBUC 	TRCCNP 	TRCCP 
TRDCNP 	TRDCP 	TREESN 	USLCMP
USLVGR	USMELT	USNCRVD 	USRADGR
USSCLAY 			

Page 2

Cell Library: PROFILE.cel

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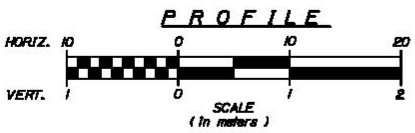

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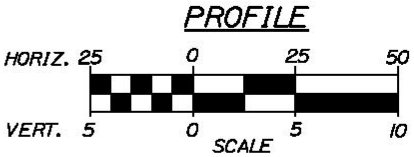

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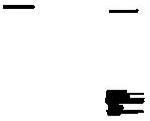
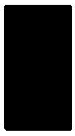
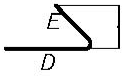
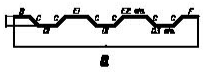
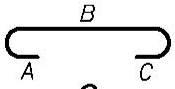
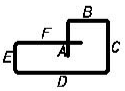
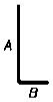
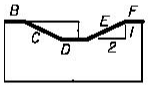
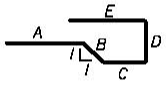
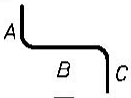
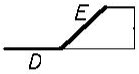
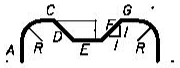
V.C.L. =

Cell Library: REBAR.CEL

BBGRID	REBNOT 	SBGRID 	TYPEA  A
TYPEB 	TYPEC  C	TYPECB CB	TYPEEP  EP
TYPEH H	TYPEHB HB	TYPEJ J	TYPEL  L
TYPEM  M	TYPEPA PA	TYPEPR PR	TYPES S
TYPESB SB	TYPESC SC	TYPESJ  SJ	TYPESL SL
TYPET  T	TYPEV  V	TYPEW  W	

Cell Library: ROW.cel

FINAORD	NOSCALE	NOTE1	ROWCOL
	NOTE: THIS PLAN IS NOT TO SCALE		PERMANENT EASEMENT TEMPORARY EASEMENT TEMPORARY ROAD EASEMENT
ROWCOL2	RWBIRD	RWCVD	RWNAGRID
DRAINAGE EASEMENT PERMANENT EASEMENT TEMPORARY EASEMENT TEMPORARY ROAD EASEMENT		CURVE DATA P.I. STA. Δ = T = L = E = R =	
RWNAMAG	RWNM1	RWNM2	RWNM3
RWNRES	RWNRR1	RWNRR2	RWNWP
NOTE: USE OF LAND AND BUILDING WITHIN AREA INDICATED RESERVED TO OWNER UNTIL	NOTE: RIGHTS TAKEN TO RAZE AND REMOVE THAT PORTION OF THE BUILDING THAT LIES OUTSIDE OF THE NEW BOUNDARIES OF STATE HIGHWAY " " AT ABOUT STA. X	NOTE: RIGHTS TAKEN TO RAZE OR REMOVE BUILDING AT STA. X	NOTE: PRESCRIPTIVE EASEMENT FOR HIGHWAY PURPOSES WITHIN LIMITS OF WROUGHT PORTION
RWSCOA	RWSREG	RWSU	RWSUIT
CONTROLLED ACCESS LIMIT CONTROLLED ACCESS LIMIT LINE ALONG R/W LINE R/W LINE CONTROLLED ACCESS LIMIT LINE NOT ON R/W LINE NO ACCESS WILL BE PERMITTED TO OR FROM STATE HIGHWAY "X" AND ADJOINING PROPERTIES WITHIN BOUNDARIES DEFINED BY CONTROLLED ACCESS LIMIT LINES	STATE OF MAINE REGISTRY OF DEEDS COUNTY RECEIVED at ___ h. ___ m. ___ M and recorded in Plan Book ___, Page ___ Attest: REGISTER	PARCEL NO. ( ) LAND TAKEN = SLOPE EASE. = TEMP. CONST. RIGHTS = TOTAL AREA = REM. AREA =	ITEM NO. ( ) GRADING RIGHTS = TOTAL AREA =
RWSUTC	RWSUWP	RWTICK	
ITEM NO. () TEMP. CONST. RIGHTS = TOTAL AREA =	PARCEL NO. ( ) LAND TAKEN = (PRESC. EASE.) LAND TAKEN = (OTHER) TOTAL LAND TAKEN = SLOPE EASE. = TEMP. CONST. RIGHTS = TOTAL AREA = REM. AREA =	0+000	

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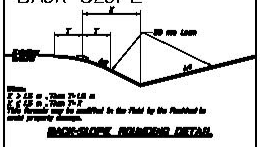
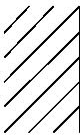
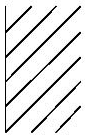
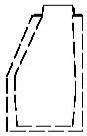
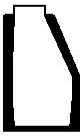
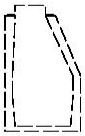
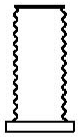
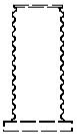
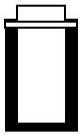
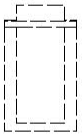
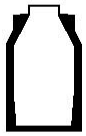
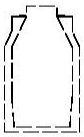
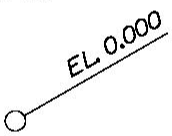
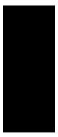
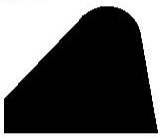
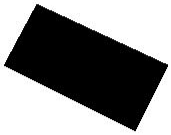
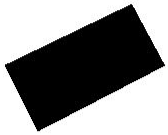
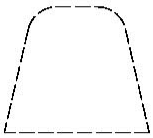
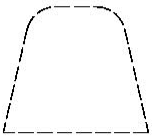
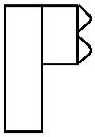
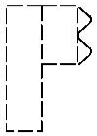
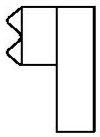
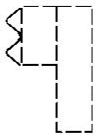
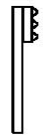
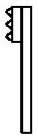
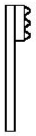
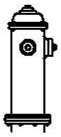
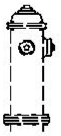
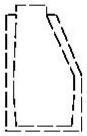
BACK SLOPE 	BLDSCL 	BLDSCR 	CB5LTP
CB5LTX 	CB5RTP 	CB5RTX 	CBSCEP 
CBSCEX 	CBSCFP 	CBSCFX 	CBSECP 
CBSECX 	CLELFL 	CRBILT	CRBIRT
CRB2LT	CRB2RT 	CRB3IL	CRB3IR
CRB32L	CRB32R 	CRB33L	CRB33R
CRB5LT 	CRB5RT 	CRX3IL 	CRX3IR 
CTRLNS	DITCH	GRLSCP 	GRLSCX 

Page 1

Cell Library: SECTION.cel

GRRSCP 	GRRSCX 	GRTSCL 	GRTSCR 
GRTSEC 	GRTSRT	HYDRSC 	HYDRSX 
MHSCPL	MHSCPR	MHSCXL	MHSCXR 
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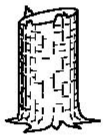
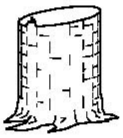
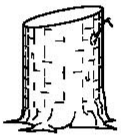
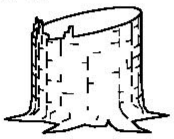
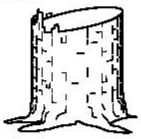
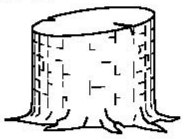
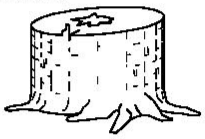
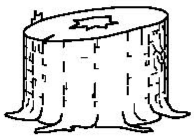
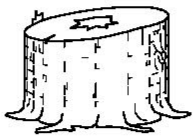
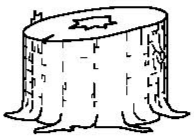
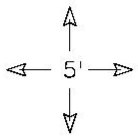
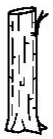
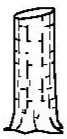
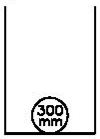
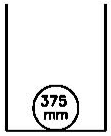
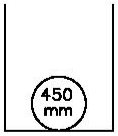
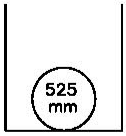
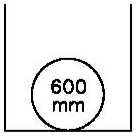
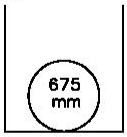
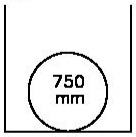
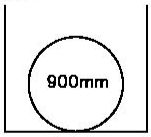
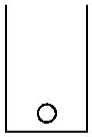
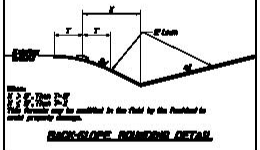
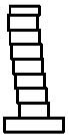
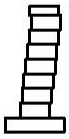
SI0212 	SI3216	SI7220 	S2I224 
S25228 	S29232 	S33236 	S37242 
S43248 	S49254 	S55260 	SCL5FT 
STMI23	STM426 	STM729 	U300MM 

Page 2

Cell Library: SECTION.cel

U375MM 	U450MM 	U525MM 	U600MM 
U675MM 	U750MM 	U900MM 	UDRANB 
USBACK SLOPE 	XRETWL 	XRETWR 	

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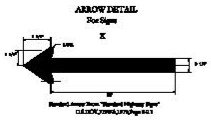
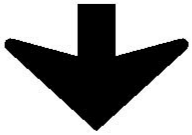
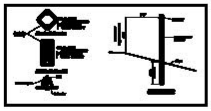
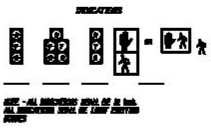
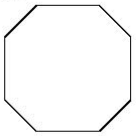
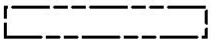
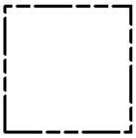
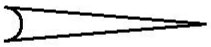
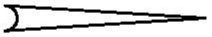
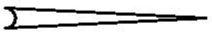
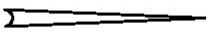
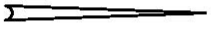
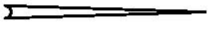
ARWDTL 	ARWDWB 	ARWUPB	ARWUPL
DLNDTL 	DLPLTP	INDCAT 	JUNCBX 
LUP640 	LUP650	LUP66 	LUP68
MAST15 	MAST20 	MAST25 	MAST30 
MAST35 	MAST40 	MAST45	MAST50
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Page 1

Cell Library: TRAFFIC.cel

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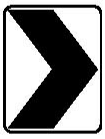
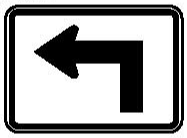
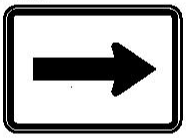
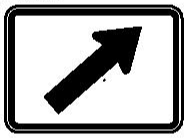
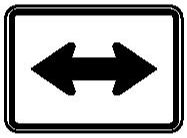
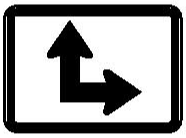
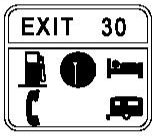
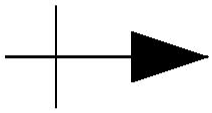
SCRV4R	SCRV5R	SCRVMK 	SDNENT
SDRM5I 	SDRM6I 	SDRM62 	SDRM63
SDRM64 	SDRM66 	SEAST	SEMCEL
SEXINF 	SGHEDP	SGNLTM	SIGNOH 
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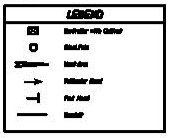
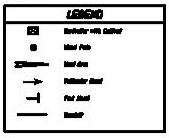
SKPLBR	SKRETP	SLGDSP 	SLGDWP 

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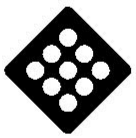
SNRTTR	SNUTR	SOM3	SOMCIR 
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SSHAND	SSHOSP	SSINFO	SSLODG

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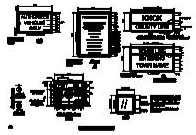
SSMESI 	SSNO	SSOUT	SSPED
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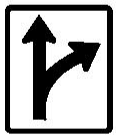
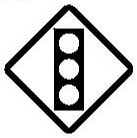
SSTPAH	SSTPAT	STHRRT 	STHRU
STLAHD 	STO	STONLY	STR7IA
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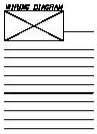
SYIELD	SYLTOG	WIRNDI 	

Cell Library: turnradii.cel

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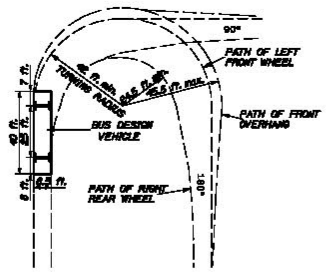

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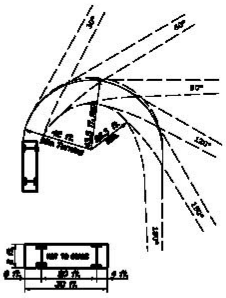

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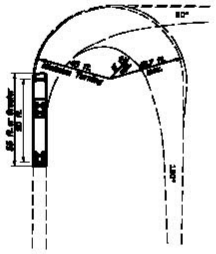

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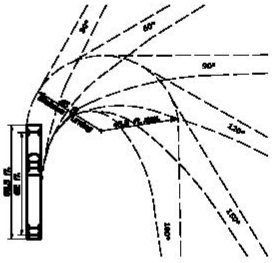

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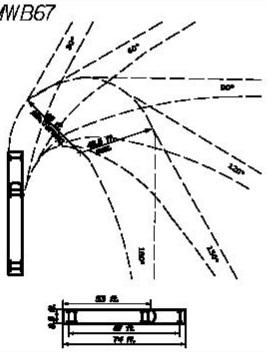

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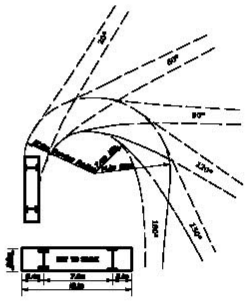

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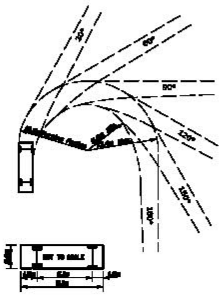

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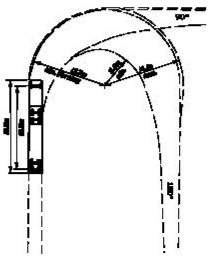
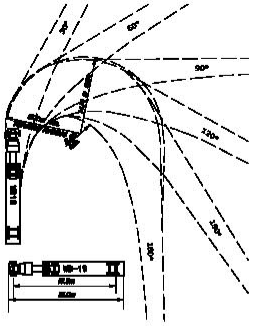
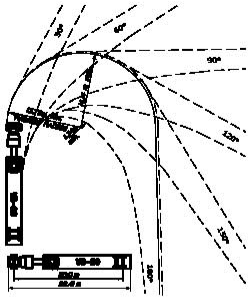


Page 1

Cell Library: turnradii.cel

Cell Name: MEWB19 	Cell Name: MEWB20 

Cell Library: US_BridgeStNotes.cel

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USNCOFF	USNDESG	USNDESL	USNDRAN
USNELBR	USNGENC	USNHYDF	USNHYDP
USNMATR	USNMOTR	USNPIER	USNPILE
USNPREC	USNSPEC	USNSTL	USNSTPL
USNSUP	USNTRAF	USNTWALL	USNUTIL

Cell Library: US_ROW.CEL

USFINAORD	USNOSCALE	USNOTEI	USROWCOL
	NOTE: THIS PLAN IS NOT TO SCALE		DRAINAGE EASEMENT PERMANENT EASEMENT TEMPORARY EASEMENT TEMPORARY ROAD EASEMENT
USRWBIRD	USRWCVD	USRWNAGRID	USRWNAMAG
	CURVE DATA P.I. STA. D = Δ = T = L = E = R =		
USRWNM1	USRWNM2	USRWNM3	USRWNRES
			NOTE: USE OF LAND AND BUILDING WITHIN AREA INDICATED RESERVED TO OWNER UNTIL
USRWNRR1	USRWNRR2	USRWNWP	USRWSCOA
NOTE: RIGHTS TAKEN TO RAZE AND REMOVE THAT PORTION OF THE BUILDING THAT LIES OUTSIDE OF THE NEW BOUNDARIES OF STATE HIGHWAY " " AT ABOUT STA. X	NOTE: RIGHTS TAKEN TO RAZE OR REMOVE BUILDING AT STA. X	NOTE: PRESCRIPTIVE EASEMENT FOR HIGHWAY PURPOSES WITHIN LIMITS OF WROUGHT PORTION	CONTROLLED ACCESS LIMIT
USRWSREG	USRWSU	USRWSUIT	USRWSUTC
STATE OF MAINE REGISTRY OF DEEDS	PARCEL NO. ( ) LAND TAKEN = SLOPE EASE. = TEMP. CONST. RIGHTS = TOTAL AREA = REM. AREA =	ITEM NO. ( ) GRADING RIGHTS = TOTAL AREA =	ITEM NO. () TEMP. CONST. RIGHTS = TOTAL AREA =
USRWSUWP	USRWTICK		
PARCEL NO. ( ) LAND TAKEN = (PRESC. EASE.) LAND TAKEN = (OTHER) TOTAL LAND TAKEN = SLOPE EASE. = TEMP. CONST. RIGHTS = TOTAL AREA = REM. AREA =	0+00		

Cell Library: usBorder.cel

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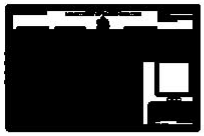
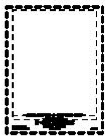
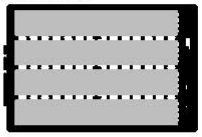
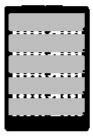
USBDGBORDER	USBORDER	USBORDERSC	USBRGTITLE
USCL8XII	USCLP2	USCONOTE	USCSTBRD
USDOTADD	USDRAINAGE	USEN8XII	USENVLAY
USENVTITLE	USESTIMATE	USHWYTITLE	USLMAPBD
USMULTITITLE	USPLANPROF1	USPLANPROF2	USPLNSH2
USPLNSHT	USPROFILE	USPROFILE1	USPROFILE2
USPROFSC	USREBAR	USRWBORD	USRWBORDDT

Page 1

Cell Library: usBorder.cel

USRWCLP2	USRWCOORD 	USSTDDTL 	USTYPICAL
USXSECTH 	USXSECTHF	USXSECTION	USXSECTV 
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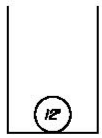
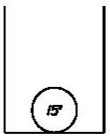
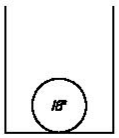
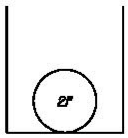
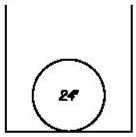
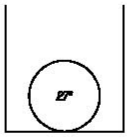
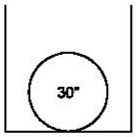
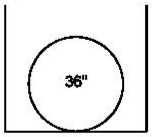
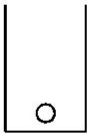
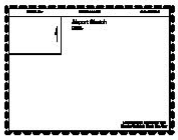
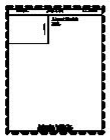
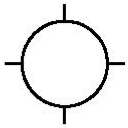
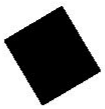
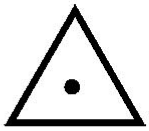
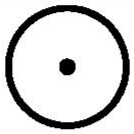
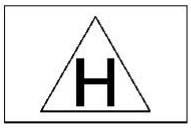
U12IN 	U15IN 	U18IN 	U21IN 
U24IN 	U27IN 	U30IN 	U36IN 
UDRANB 			

Page 1

Cell Library: Usairport.cel

A S BORDER LAND 	A S BORDER PORT 	AIRPORT LOCATION 	ASOS 
AWOS	BEACON	CLOSE IN OBSTRUCTION AND TEXT 	CONTROLLING OBSTRUCTION AND TEXT 
GS	HELIPAD LOCATOR 	LOCALIZER	LOCATIOM MAP
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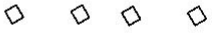
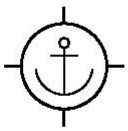
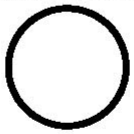
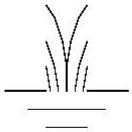
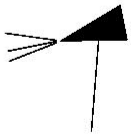
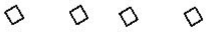
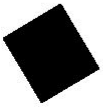
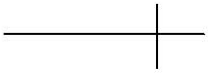
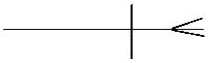
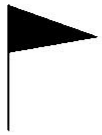
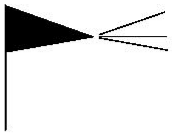
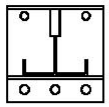
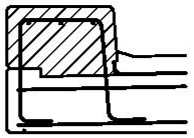
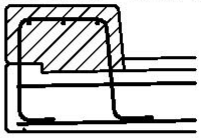
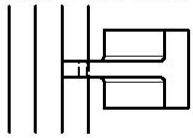
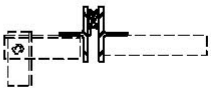
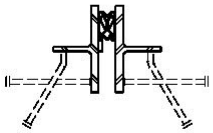
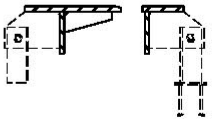
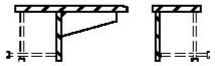
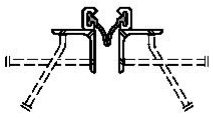
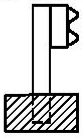
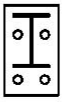
PAPI 	REILS	RUNWAY GRADIENT	RUNWAY ID NUMBER
SCALE!IN500FT	SEAPLANE BASE LOCATOR 	SECUHAZ	SEGMENTED CIRCLE 
SWAMP 	TETRAHEDRON	TETRAHEDRON LIGHTED 	THRESHOLD LIGHTS 
VASI	VOR 	WIND TEE 	WIND TEE LIGHTED 

Page 1

Cell Library: Usairport.cel

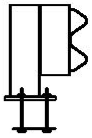
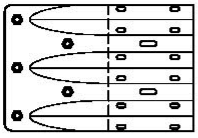
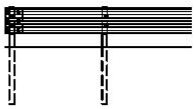
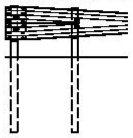
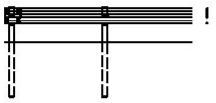
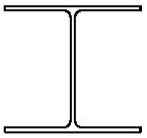
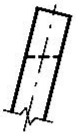
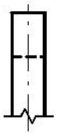
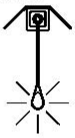
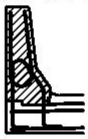
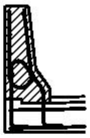
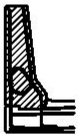
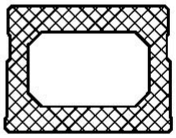
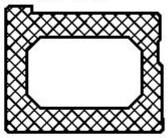
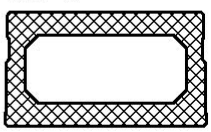
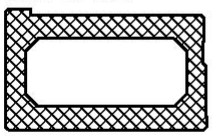
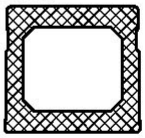
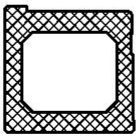
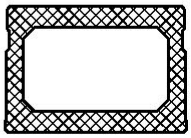
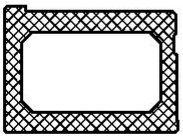
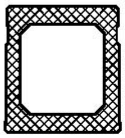
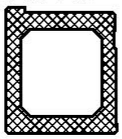
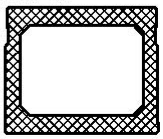
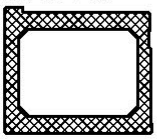
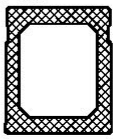
WINSOCK 	WINSOCK LIGHTED 		

Cell Library: USBRDETLIB.cel

ALUM BR 2 BAR TRAFFIC	ALUM BR BASE 	BRIDGE TRANS 1	CONC CURB - BIT WS 
CONC CURB - CONC WS 	CONSPAN 12	CONSPAN 14	CONSPAN 16A
CONSPAN 16B	CONSPAN 20A	CONSPAN 20B	CONSPAN 24A
CONSPAN 24B	CONSPAN 28A	CONSPAN 28B	CONSPAN 32A
CONSPAN 32B	CONSPAN 36A	CONSPAN 36B	CONSPAN 42EXT
CONSPAN 42MOD	CONSPAN 48EXT	CONSPAN WNG PLAN 	CONSPAN WNG SECT
EXP DEV COMP 1 	EXP DEV COMP 2 	EXP DEV FINGER 1 	EXP DEV FINGER 2 
EXP DEV GLAND 1	EXP DEV GLAND 2 	GR CONC BLOCK 	GR CURB MTD BASE 

Page 1

Cell Library: USBRDETLIB.cel

GR CURB MTD ELEV	GR CURB MTD SECT 	GR THRIE BEAM CON 	GR THRIE BEAM ELEV 
GR THRIE BEAM SECT	GR THRIE BEAM TRANS 	GR W BEAM ELEV 	GR W BEAM SECT
H-PILE PLAN BATTERED	H-PILE PLAN PLUMB 	H-PILE SECT BATTERED 	H-PILE SECT PLUMB 
LIGHT ELEV	LIGHT PLAN 	LIGHT PLAN FOUND	PC BARRIER IIIA - BIT WS 
PC BARRIER IIIA - CONC WS 	PC BARRIER IIIB - BIT WS 	PC BARRIER IIIB - CONC WS	PCI BI-36 
PCI BI-36 EXT 	PCI BI-48 	PCI BI-48 EXT 	PCI BII-36 
PCI BII-36 EXT 	PCI BII-48 	PCI BII-48 EXT 	PCI BIII-36 
PCI BIII-36 EXT 	PCI BIII-48 	PCI BIII-48 EXT 	PCI BIV-36 

Page 2

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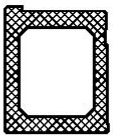
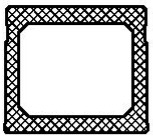
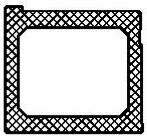
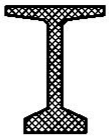
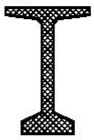
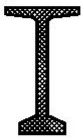
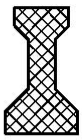
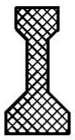
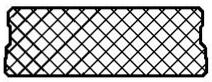
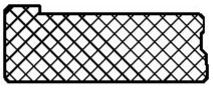
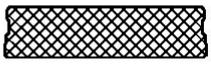
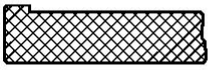
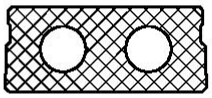
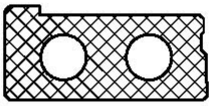
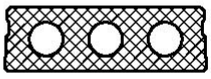
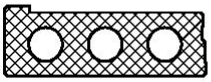
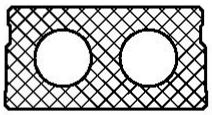
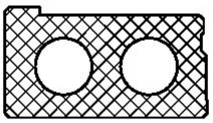
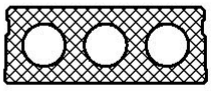
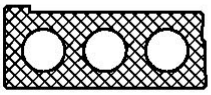
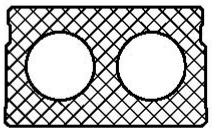
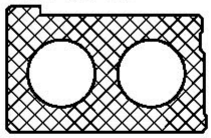
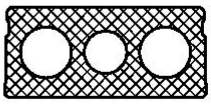
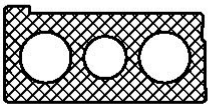
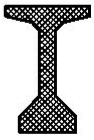
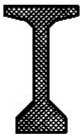
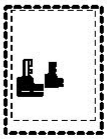
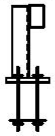
PCI BIV-36 EXT 	PCI BIV-48 	PCI BIV-48 EXT 	PCI BT-54 
PCI BT-63 	PCI BT-72 	PCI I 	PCI II 
PCI III	PCI IV	PCI SI-36 	PCI SI-36 EXT 
PCI SI-48 	PCI SI-48 EXT 	PCI SII-36 	PCI SII-36 EXT 
PCI SII-48 	PCI SII-48 EXT 	PCI SIII-36 	PCI SIII-36 EXT 
PCI SIII-48 	PCI SIII-48 EXT 	PCI SIV-36 	PCI SIV-36 EXT 
PCI SIV-48 	PCI SIV-48 EXT 	PCI V 	PCI VI 
SAMPLE RAIL AND CURB 	STL BR 1 BAR BM PED 	STL BR 2 BAR BM BIKE	STL BR 2 BAR TRAFFIC

Page 3

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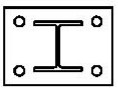
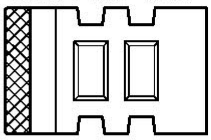
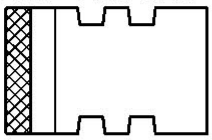
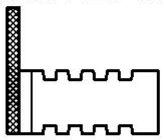
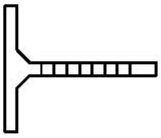
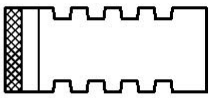
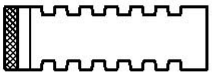
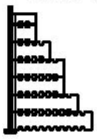
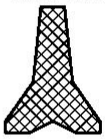
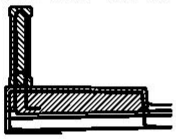
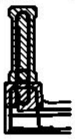
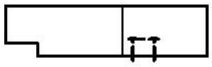
STL BR 4 BAR TRAF BIKE	STL BR 4 BAR TRAF PED	STL BR BASE 	T-WALL 10' STD SECT
T-WALL 12' STD SECT	T-WALL 4' DET SECT 	T-WALL 4' STD SECT 	T-WALL 6' EXTD SECT 
T-WALL 6' PLAN 	T-WALL 6' STD SECT 	T-WALL 8' STD SECT 	T-WALL BAT SECT
T-WALL PLUMB SECT 	TEMP CONC BARRIER 	TEX BR PED - BIT WS 	TEX BR TRAF - BIT WS 
TRANS BARRIER PLAN 			

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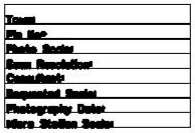
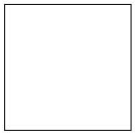
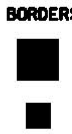
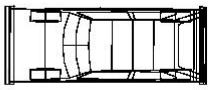
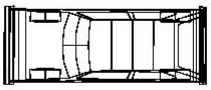
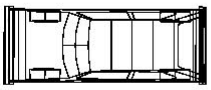
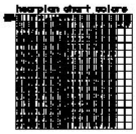
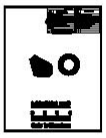
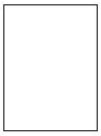
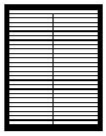
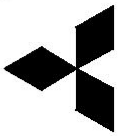
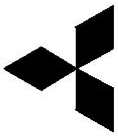
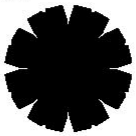
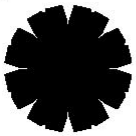
3D MAN	3D MAN2	AERIAL 	AIR 
BORDER 	CAR1 	CAR2 	CAR3 
CHART	CHART2	CHART3 	COLKEY
DIRIGO	DOT	GUIDE1	GUIDE2
LODMAP 	LOGO	PC	PLAN1
PROF1	REC	REC2 	REC3
SCALE2	SCALE3	TITLEB 	TRBUC
TRCCNP 	TRCCP 	TRDCNP 	TRDCP 

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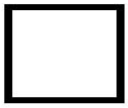
USTATE 	USW		

Page 2

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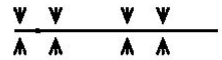
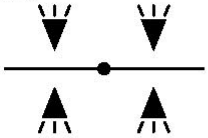
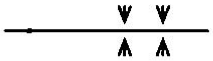
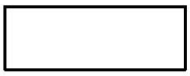
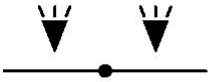
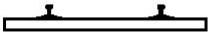
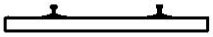
RXDDFC 	RXDF 	RXDFC 	RXDFWG
RXSB 	RXSF 	RXSFC	RXSFWG
RXSWG	TwR6x8x102 	TwR7x9x108 	

MX STRING LABELS

MX STRING LABELS

BAB = BRIDGE: ABUTMENT (Bottom)

BB = BUILDING: BUSINESS/COMMERCIAL

BCB = BRIDGE: CURB

BCL = BRIDGE: CENTERLINE

BCR = BRIDGE: COLUMN (2 shots on diameter)

BCS = BRIDGE: COLUMN (Square 3 corners)

BDK = BRIDGE: DECK

BEJ = BRIDGE: EXPANSION JOINT

BFA = BRIDGE: FASCHIA

BFB = BRIDGE: FOOTING (Bottom)

BFT = BRIDGE: FOOTING (Top)

BIL = BRIDGE: RAIL

BLZ = BLAZED LINE

BM = BUILDING: MUNICIPAL/GOVERNMENT

BP = BUILDING: PORCH/DECK/BULKHEAD, ETC.

BPA = BRIDGE: PARAPET

BPI = BRIDGE: PIER (Bottom)

BR = BUILDING: RESIDENTIAL

BST = BRIDGE: SEAT

BWT = BRIDGE: WINGWALL (Top)

BX = CULVERT: BOX CULVERT

BZ = BUILDING: RUINS/CELLAR HOLE/FOUND.

C = CENTERLINE

CAP = CULVERT: CORRUGATED ARCH PIPE

CB = CURB: BITUMINOUS (Top)

CC = CURB: CONCRETE (Top)

CE = CURB: GRANITE EDGING (Sloped Curb)

CEM = CEMETERY

CG = CURB: GRANITE (Top)

CHEK= CHECK SHOT ON TRAV. / BM

CMT = CULVERT: MULTI-PLATE

CO = CURB: OTHER (Top)

CP = CONCRETE PAD/SLAB

CS = CURB: BUMPER

CU = CENTERLINE OF RUN

CV = CULVERT: TOP

CY = CANOPY / CARPORT

DAM = DAM

DC = DRIVEWAY: CONCRETE

DG = DRIVEWAY: GRAVEL

DL = DITCH LINE

DMG = DAM GATE

DNS = DOWNSPOUT (Ditch)

DO = DRIVEWAY: OTHER (Must be commented)

DP = DRIVEWAY: PAVED

EF = ENTRANCE: FIELD

EP = EDGE: PAVEMENT

ES = EDGE: SHOULDER

EW = ENTRANCE: WOODS

F = FENCE

FB = FENCE: BARBED WIRE

FC = FENCE: CHAIN LINK

FE = FENCE: ELECTRIC

FG = FENCE: GATE

FLY = FLY POINT (a.k.a. TOPO POINT)

FP = FENCE: PAGE

FPI = FENCE: PICKET

FPR = FENCE: POST AND RAIL

FS = FENCE: STOCKADE/POST/PLANK

FSR = FENCE: SPLIT RAIL

FW = FENCE: SMOOTH WIRE (Non-Electric)

G = GROUND: ALL GROUND FEATURES

GB = GUARDRAIL: BEAM

GC = GUARDRAIL: CABLE

GJ = GUARDRAIL: JERSEY BARRIER

GN = GARDEN

GPI = GAS PUMP ISLAND (Top)

GU = GUARDRAIL: OTHER

HE = HEDGE

HWT = HEADWALL: TOP

KB = STEPS: BRICK (Must be commented)

KC = STEPS: CONCRETE (Must be commented)

KO = STEPS: OTHER (Must be commented)

KS = STEPS: STONE (Must be commented)

KW = STEPS: WOOD (Must be commented)

L = LEVEL STRING

LA = LAWN

LE = LEDGE / OUTCROP

LF = LEACHFIELD

LMB = MULTIPLE MAILBOXES (2 SHOTS)

LP = PLANTER

PALM= ALARM BOX ON POST

PBDN= BRIDGE: DOWNSPOUT

PBLD= BOULDER / ROCK

PBMK= BENCH MARK

PBOR= BORING LOCATIONS

PBTH= TELEPHONE: PUBLIC

PBUS= BUSH/SHRUB (Center)

PCBI= CATCH BASIN: INVERT

PCBS= CATCH BASIN: SUMP

PCBT= CATCH BASIN: TOP

PCLP= CENTERLINE POINT (R/R Spike)

PCMN= CONCRETE MONUMENT (General)

PCTL= GEODETIC CONTROL POINT

PCUI= CULVERT: INVERT

PDAT= ANTENNA/TOWER/DISH

PDIN= DROP INLET

PDRO= DRAIN OUTLET

PDTN= TREE: DEAD (Non-Pay Less than 12")

PDTP= TREE: DEAD (Pay 12" or Larger)

PELO= ELECTRICAL OUTLET

PELV= SPOT ELEVATION

PFLY= SURVEY FLY POINT

PGBM= GEODETIC BENCH MARK

PGGT= GAS GATE

PGPM= GAS PUMPS

PGRA= GRAVE / GRAVE MARKER

PGSO= GAS SHUT-OFF

PHYD= HYDRANT

PIPP= IRON PIN / PIPE

PITT= UTILITY ESCAVATION

PJCT= CONTROL/JUNCTION BOX

PLED= LEDGE OUTCROP

PMBX= MAILBOX

PMHD= MANHOLE: DRAINAGE

PMHE= MANHOLE: ELECTRIC

PMHG= MANHOLE: GAS

PMHS= MANHOLE: SEWER

PMHT= MANHOLE: TELEPHONE

PMHU= MANHOLE: UNKNOWN USE

PMHW= MANHOLE: WATER

POLB= POLE: BRACE

POLE= POLE: POWER POLE

POLF= POLE: FLAGPOLE

POLG= POLE: GUY WIRE ANCHOR

POLJ= POLE: JOINT POWER AND TELEPHONE

POLL= POLE: STREET LIGHT / LAMP POST

POLS= POLE: SUPPORT

POLT= POLE: TELEPHONE / TELEGRAPH

POLU= POLE: STUB

PPCN= POST: CONCRETE

PPJM= PROJECT MARKER

PPST= POST: STEEL

PPWD= POST: WOOD

PRPL= RARE PLANT

PRRG= RAILROAD: GATE

PRSL= RAILROAD: SIGNAL

PRSW= RAILROAD: SWITCH

PRTR= RARE TREE

PRWM= R/W MONUMENT

PSEP= SEPTIC TANK: SINGLE SHOT

PRSH= RARE SHRUB

PSGN= SIGN: SINGLE POST

PSIL= SILL ELEVATION

PSMN= STONE MONUMENT (General)

PSSA= SURVEY TRAVERSE STATION

PSTT= STORAGE TANK FILL CAP

PSUR= SURVEY MONUMENT

PTCN= TREE: CONIFER (Non-Pay Less than 12")

PTCP= TREE: CONIFER (Pay 12" or Larger)

PTDN= TREE: DECIDUOUS (Non-Pay Less than 12")

PTDP= TREE: DECIDUOUS (Pay 12" or Larger)

PTOW= UTILITY TOWER (Center)

PTRA= SURVEY TRAVERSE POINT

PTRR= TREE: ROOT

PTRS= TREE: STUMP

PTSM= TRAFFIC SIGNAL: POLE W/ MAST ARM

PTSS= TRAFFIC SIGNAL: SIGNAL POLE

PUDO= UNDERDRAIN OUTLET

PVNT= VENT PIPE

PWGT= WATER GATE

PWLG= WELL: GROUND ELEVATION

PWLT= WELL: TOP

PWSO= WATER SHUT-OFF

PYLT= YARD: LIGHT

PZZZ= MISC. ITEMS (MUST BE COMMENTED)

QB = FIREPLACE / BAR-B-QUE

QP = POOLS

RP = RIPRAP

RT = RAILROAD: TRACKS

RWT = RETAINING WALL: TOP

SB = SIDEWALK: BRICK

SC = SIDEWALK: CONCRETE

SGG = STORAGE TANK: LP GAS, PROPANE, ETC

SGP = STORAGE TANK: GASOLINE, OIL, ETC.

SGT = STORAGE TANK

SGW = STORAGE TANK: WATER

SLW = SLUICEWAY

SN = SIGN: BASE

SND = SIGN: DOUBLE POSTS (2 SHOTS)

SO = SIDEWALK: OTHER (Must be commented)

SP = SIDEWALK: PAVED

SPT = SEPTIC TANK: EXPOSED

SW = STONE WALL

TB = TREE: TREE LINE (BUSHES)

TI = TRAVERSE TIES

TL = TREE: EDGE WOODS / TREE LINE

UE = UNDERGROUND ELECTRIC

UG = UNDERGROUND GAS

UO = UNDERGROUND OIL MAIN

US = UNDERGROUND SEWER

UT = UNDERGROUND TELEPHONE

UW = UNDERGROUND WATER

VA = WETLAND: ESTUARINE UNVEG.SUBSTR.

VC = WETLAND: ESTUARINE EMERGENT

VE = WETLAND: PALUSTRINE EMERGENT

VH = WETLAND: PALUSTRINE SCRUB-SHRUB

VK = WETLAND: PALUSTRINE FORESTED

VO = WETLAND: UNCLASSIFIED

VR = WETLAND: RIVERINE UNCONS.SUBSTR.

VU = WETLAND: LACUSTRINE UNCONS.SUBSTR.

VW = WETLAND: VERNAL POOL

WA = EDGE: WET AREA

WC = WALKWAY: CONCRETE

WO = WALKWAY: OTHER (Must be commented)

WP = WALKWAY: PAVED

WR = EDGE: RIVER/BK./STR./POND/LAKE

WX = PAINTED LINES

X = EDGE: TRAVELLED WAY

YG = YARD: GRAVEL

YP = YARD: PAVED

ZZ = MISC. FEATURE (MUST BE COMMENTED)

TEXT

Accessing Custom Symbols

We have added a number of characters to our fonts. They can be accessed from the text editor by typing a “backslash” and then the number corresponding to the character.

Note that in these tables, the number corresponding to a symbol is the number above the symbol. So to type the Centerline symbol, type “\201”

The Degrees Symbol

The degrees symbol can be accessed by typing **Shift + 6** (the ^ symbol).

Font 32: DOT_ENG

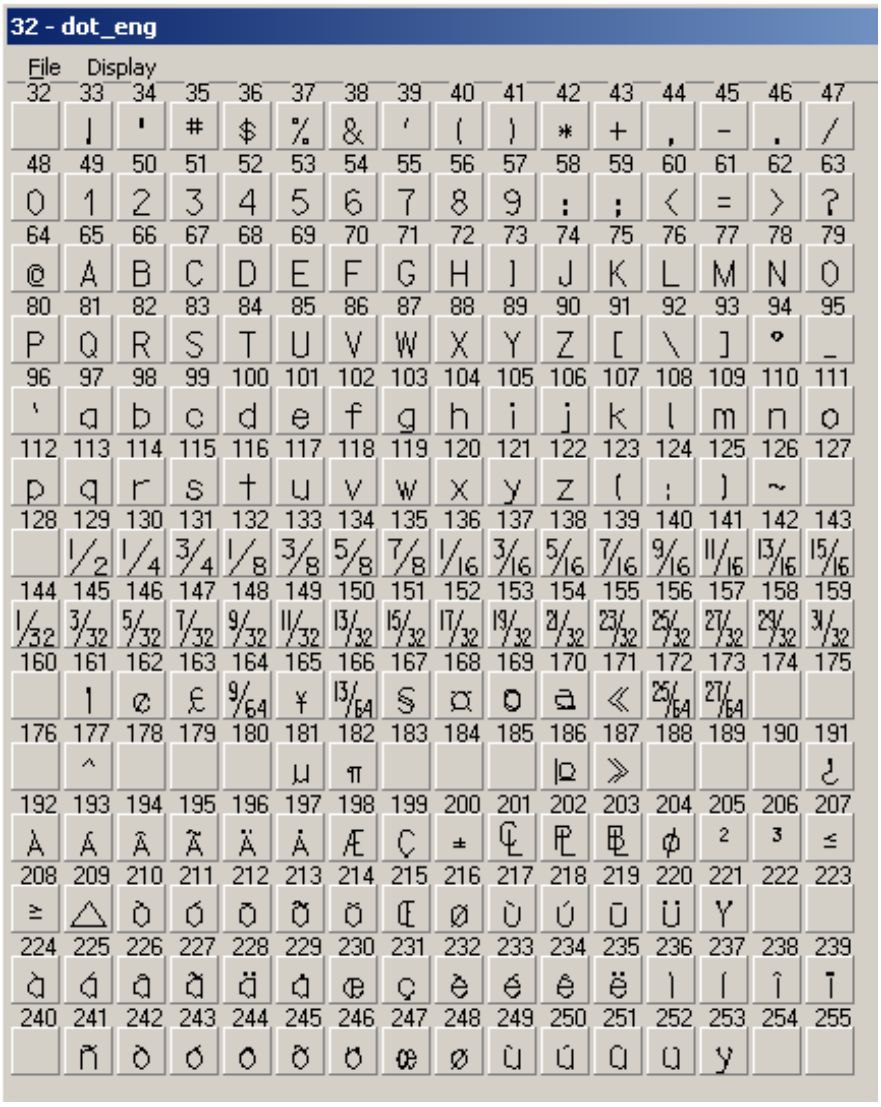


Figure 16-4: Character Map of Font 32, DOT_ENG

Font 123 DOTITALICS

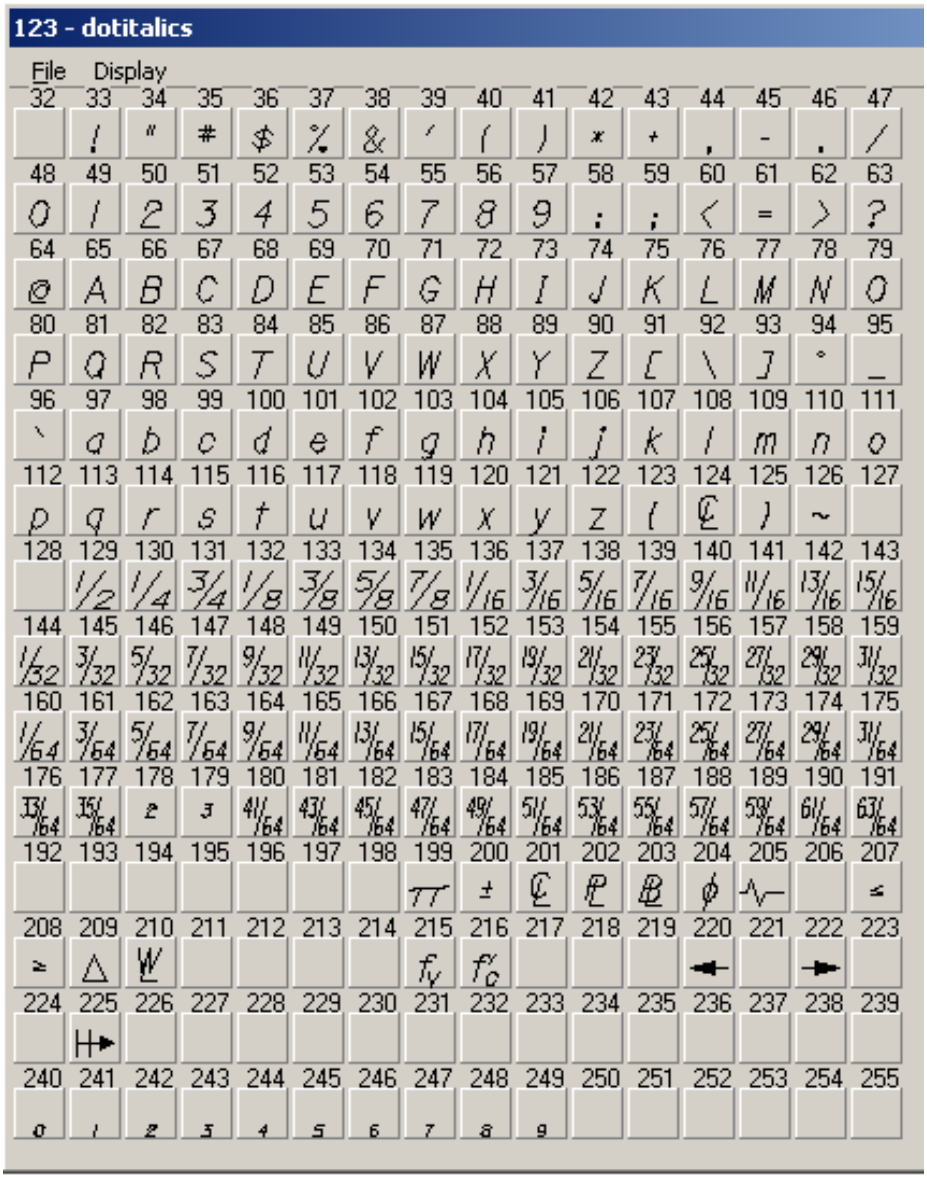


Figure 16-5: Character Map of Font 123, dotitalics

Font 229 (Verdana)

Figure 16-6: Character Map of Font 229, Verdana

Chapter 17 Finalizing a Project

PROJECT WRAP UP

This portion of the MicroStation Manual is intended to provide the general workflow of a project once it has been completely designed and detailed in accordance to the MaineDOT standards. It makes reference to many topics already described in previous chapters of the manual. As opposed to duplicating this information, we briefly describe the steps involved and reference the pages where we describe the topic in great detail. The *Sheet Re-numbering Utility*, the *Border Information* macro, *Batch Printing* and the *MicroStation Packager* will be used in this chapter.

RE-NUMBERING UTILITY

Overview

MaineDOT uses a 3 digit prefix followed by an underscore "_" on every .dgn file that is going to be placed in a printed plan package. After the underscore is a standard, sheet type identifier (i.e. 001_title.dgn). Sometimes this is immediately followed by numbering for sheets of similar types (i.e. 011_HDPlan15.dgn).

> ✓ *For a complete list of acceptable file names, please refer to the CADD Webpage at the following address: http://www.maine.gov/mdot/cadd-support/microstation/std_filename.php .*

With the MaineDOT configuration, we take the 3 digit prefix and use it as the page number that appears in the title block for each sheet. Therefore, each drawing with the 3 digit prefix has a border in it. We have a custom program called the *Sheet Renumbering Utility* to make it easier to renumber/rename your sheets to get them in the correct order. All MicroStation users should have this program installed at the same time MicroStation is installed. Contact CADD Support if this program is not installed.

♫ Regional offices that produce projects that are partially a book job and partially a plan package should still use this numbering sequence, but only on the sheets that are going to be printed for the final contract drawings. All other areas that are covered by the book portion of the project should have the 3 digit prefix stripped from the file name. This can be accomplished easily by using the *Sheet Renumbering Utility*.

ⓘ ***Do not create sub folders to separate the two portions of a Book/Plan Package. All final MicroStation drawing should remain in your workgroup's /MSTA folder.***

Step One: Start Re-numbering Utility Program

If the Ying-yang icon is not on your *Desktop*, you can launch the program by selecting **Start>Programs>MDOT Utilities>MDOT MicroStation Sheet Renumbering Utility.**

ⓘ ***Close all MicroStation files and be sure that no one is accessing files in your workgroups MSTA directory. The program needs to rename the files and cannot if someone has one open.***

Step Two: Arrange Files

Arrange the files that are going to be submitted in the correct ascending order that they will fall in the plan package.

Step Three: Renumber Files

Click on **Renumber Plot Files** and the program will place or replace the 3 digit prefix with the number in which it falls in the list.

> ✓ *Please refer to page 1-22 for more detailed instructions on the Sheet Renumbering Utility.*

Coordinate ROW Plans or Other Plans

After the last page number of the plan package is known, let the Right of Way team member (or other workgroup) know what number to start numbering his or her plan set with. They will then run the *Renumbering Utility* on their plans. It may be necessary for them to *Remove* the prefixes from their plans (not the colored version) and open *Windows Explorer* and manually add the first number and underscore (i.e. 242_) to the first file name in the ROW plan set. In the example above, this will add 241 placeholders prior to the first file. Adding this manually would be very time consuming.

BORDER INFORMATION MACRO

Overview and Benefits

The *Border Information* macro is used to write the page number into the drawing's title boxes. It also handles placement of many other variables. If this macro isn't run, many of the variables will get filled in automatically at plot time, however, without running the macro, the border still retains variables (i.e. @SHEET@, $TOWNORCITY$, $PINNUMBER$, etc.) and would get archived that way.

The benefits are many with this macro. All common title box information is entered only once and the macro will populate all the title boxes in all of the border drawings in a matter of minutes. If a variable needs to be changed, it can be updated just as fast.

Step One: Launch MicroStation

Launch MicroStation from the icon on your desktop or from the **Start** menu. Select your project from the *Project* pull down.

Step Two: Select a Numbered File

Select a file in the list with a 3 digit prefix and an underscore. Click **OK.**

Step Three: Start Macro

From the *Main Menu* select **Macros>Border Information.**

- If you get warning stating that you need to "Close MicroStation and choose a project (PIN) that is consistent with your file location" (Figure 17-1), it means that you entered MicroStation incorrectly. This is a safety measure to insure that the user is going to write the correct information into the title boxes. This is all based on the *Project* pull down matching the PIN you are working on. Close MicroStation if you get this error and go back to **Step One** and try again. If you still get an error, contact CADD Support personnel.

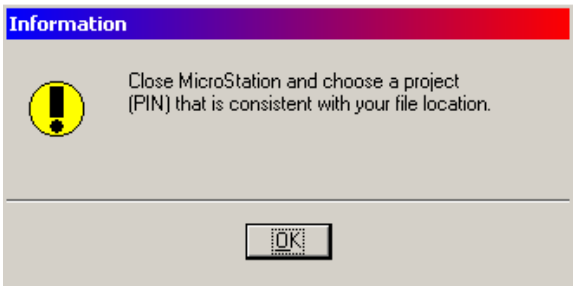


Figure 17-1: Close MicroStation and pick correct PIN.

Step Four: Single or All

If you don't get an error, you will be asked if you want to *Change Current File* or *Change Project Files.* This will enable you to process just a single file or process all of the files in the directory that meets the 3 digit prefix requirement. Make your selection.

Step Five: Review List

There is an opportunity to review and remove any files from the list of drawing to be processed.

Step Six: Process Drawings

Click **Cancel** to process the list of drawings. This usually takes less than 5 minutes even on long jobs.

✓ *Refer to page 1-27 for more information on the Border Information Macro.*

CLEANUP MSTA DIRECTORY

All Projects (In-house, Regional and Consultant)

We would like to preserve the drawings that are used in the plan set (Sheet Files) and those used to build the plan set (Reference Files). Drawings that were used temporarily, for example, the portion of a book job or unused alternatives, should be deleted if not needed. The best time to clean up a project directory is immediately after working on the project while you're still familiar with it. According to the General Consultant Agreement (GCA), consultants are required to submit electronic files in addition to hard copies. Please treat these projects as if they were designed in-house.

✓ *Please refer to page 13-1 for more information on Consultant Coordination of CADD drawings.*

Delete Temporary files

Throughout the life cycle of a project, additional cross sections are sometimes produced, the design may have been sent in two pieces, multiple alignment files are combined into one file and a project could be shortened removing a number of drawings. Any drawings, spreadsheets, or text files in the MSTA directory that are not needed and are not referenced should be deleted or moved into an "old" folder. Any MicroStation files with a .bak, .old, .xxx, etc., can be deleted as they are no longer needed.

Delete Old Folders

We create a folder named "old" as a temporary storage bin for copies of older versions of files until we know the newest version is OK. If you are certain that all files that are needed are in the MSTA directory and only junk exists in the old folder, delete the old folder. If you are uncertain of the necessity of the contents of the "old" folder, leave it alone or have someone more familiar look at it. If space on the server ever becomes an issue, we could delete all "old" folders in the whole PIN structure programmatically.

FINAL PLAN SUBMITTAL TO CONTRACTS

FINAL PRINTING

Send Title Sheet for Signatures

The title sheet is the only sheet in the plan package that needs ***hand written*** signatures. Circulate the hardcopy to the appropriate team members. There is a location on every plan page for an Engineer to stamp each sheet if necessary. This will only occur if a certain portion of the plan set was approved by an Engineer other than the one approving the Highway or Bridge work. Otherwise, the Engineer Stamp on the Title Sheet governs the internal plans in the plan package.

Once all team members have signed the Title Sheet, deliver it to the Chief Engineer's Office for the final stamp and signature.

Scan the Title Sheet and Others

Any sheet that has an Engineer stamp and signature will need to be scanned to the project's **CONTRACTS** folder (i.e. Y:\PIN\12671\00\CONTRACTS) by the Reproduction staff to be included in the final plan package as a PDF document and/or .tiff image.

- If the PIN number doesn't contain a CONTRACTS folder or if the permissions to the folder will not allow you to scan to the folder, contact CADD Support and the permissions will be adjusted.

CREATE A MULTI-PAGE PDF

Overview

We will use MicroStation's *Batch Print* utility to create a multi-page PDF file. This will provide a viewable plan set to anyone that has a computer and the free **Adobe Reader** software. This also provides a PDF file available for posting on the web for on-line bidding.

- A .pdf file is only a "snapshot" of the file at its present state. Any changes made to the MicroStation file will not be represented in the .pdf without recreating it.

Batch Printing to a Multi-page PDF

Step One: Open Batch Print (DOT)

Select **File>Batch Print (DOT)** from MicroStation's main menu. If you have a saved *Batch Print* "job" file of your final plans, select that or select **Cancel** and create a new one.

Step Two: Select the Printer

Highlight the *Printer* from the *Specifications Control Printing* portion of the dialog. Select **Specification>Select…** from the *Batch Print* dialog. Select the **pdf_bwFull** printer from available printers (Figure 17-2).

- All other *Specifications Control Printing* should say **MDOT Standard** for U.S. customary projects or **OCE** for metric projects.

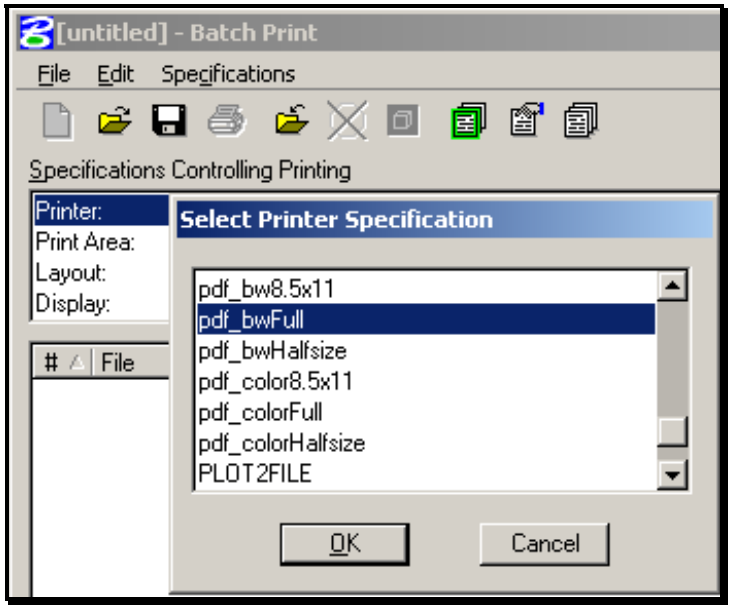


Figure 17-2: Selecting a printer from the Batch Print utility.

Step Three: Add Files

Select **Edit>Add Files…** and add the files you want to print. The list of files should include all drawings with a 3 digit prefix. These are the drawings with a border to be included in the final plan set. Browse to the ROW/MSTA folder and select all 3 digit prefix drawings with the exception of a plan set used for presentation purposes. These are identified by a higher numbering sequence than the plan package set and are followed by the c_RWPlan root

file name. If there are other workgroups submitting plans for the plan package, select these sheets also (provided that they have been numbered correctly).

Step Four: Print to Multi-Page PDF

Select **File>Print…** from the *Batch Print* dialog (Figure 17-3).

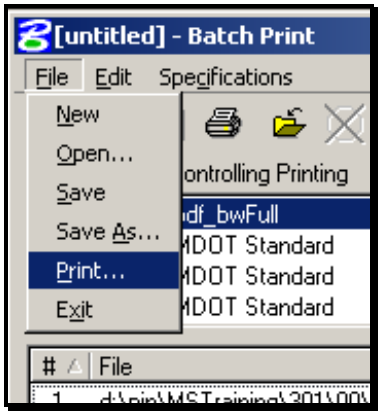


Figure 17-3: Select File>Print from the Batch Print dialog.

Step Five: Add PDF File Name

When the *Print Batch* dialog opens, select the *Browse* button in the *Document Set Single File Output* portion of the dialog (Figure 17-4).

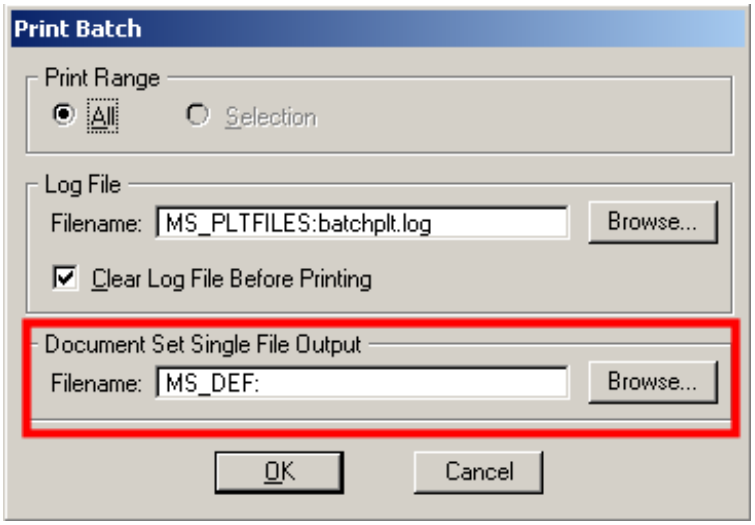


Figure 17-4: Browse to the Contracts folder of your PIN.

Browse to your project's **CONTRACTS** folder. Add a **file name** and **.pdf** extension (i.e. \CONTRACTS\12671-FinalPlans.pdf) in the *Files:* portion of the dialog (Figure 17-5). Click **OK.**

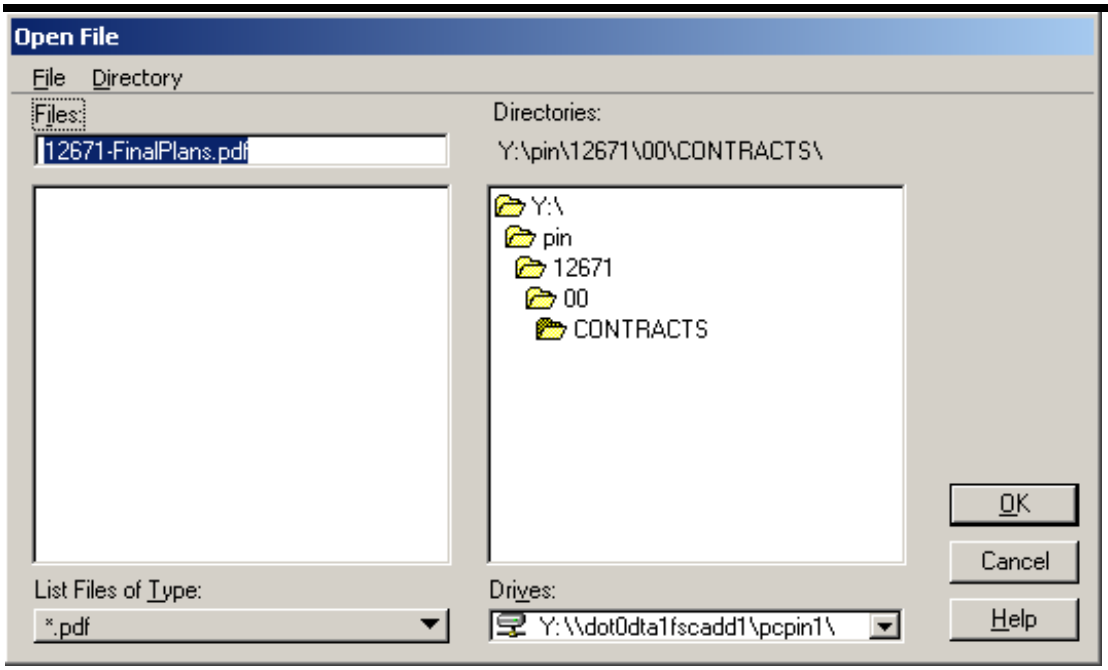


Figure 17-5 Print Batch dialog. Add the filename with the .pdf extension.

Once the path has been set, it will be displayed in the *Print Batch* dialog (Figure 17-6). Select **OK** to start the printing.

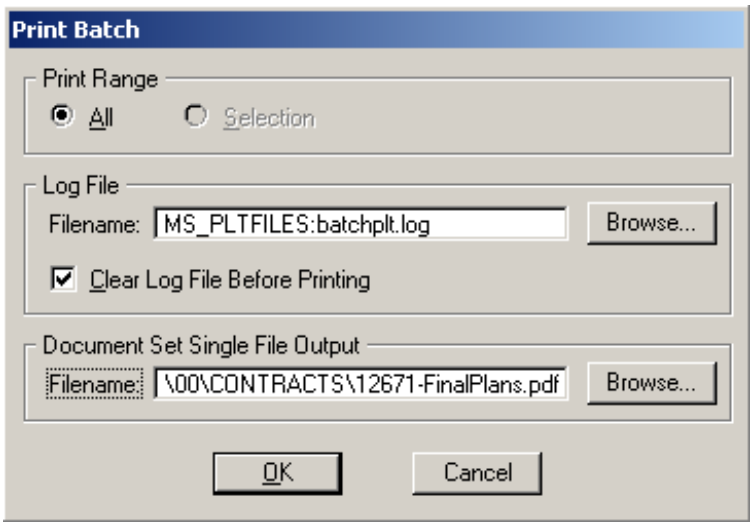


Figure 17-6: Batch Print dialog with the path and file name established.

The multi-page PDF file will be created in the **CONTRACTS** folder.

Select **File>Save As…** and save the job file as **PIN- FinalPlans.** Close the utility.

ADJUST AND PRINT THE MULTI-PAGE PDF

Overview

Prior printing the PDF, it will require some editing. This can only be done by someone with PDF Writer software. Either the Reproduction staff or someone with this software can finalize the PDF for printing.

Replace Title Sheet and Others

Any sheets that required stamps and signatures will have to be replaced. Open the PDF document and select the *Pages* tab. Right-click on a page that needs to be replaced and select **Replace Pages…** (Figure 17-7).

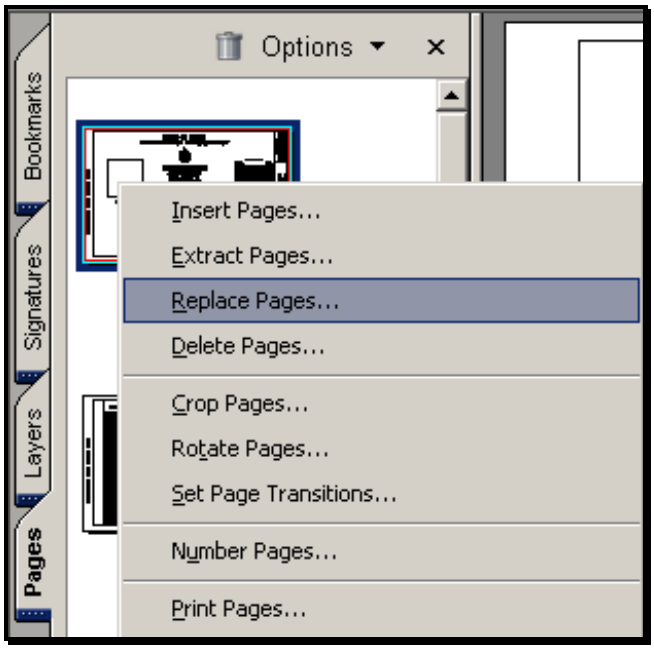


Figure 17-7: Right click to replace a page

Browse to the replacement sheet that was scanned separately, select it and click the **Select** button. A dialog will open allowing the user to replace the single page or multiple pages at once. If all replacement sheets were scanned into individual PDF documents and only one image was selected to be replaced, then the dialog doesn't need adjustment. Click **OK** (Figure 17-8).

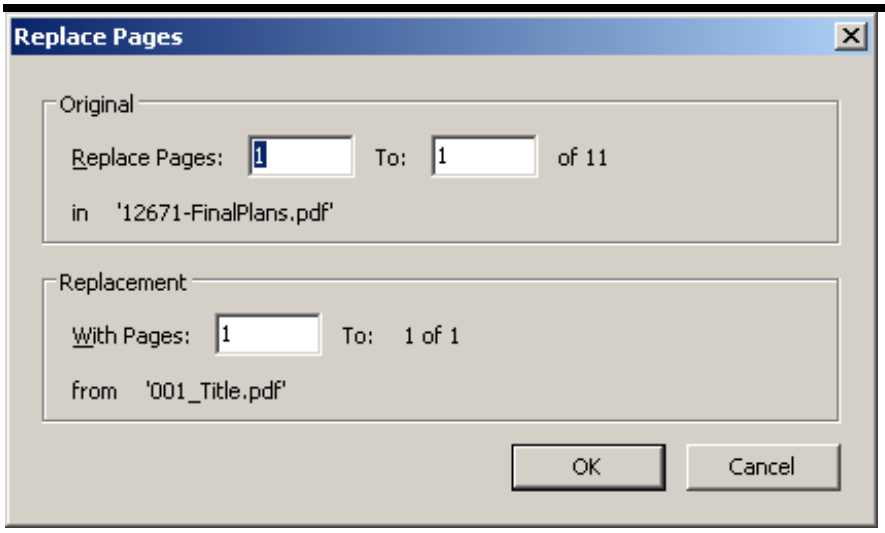


Figure 17-8: Replace Pages dialog

A *Warning* dialog will appear needing confirmation (Figure 17-9). Click **OK.**

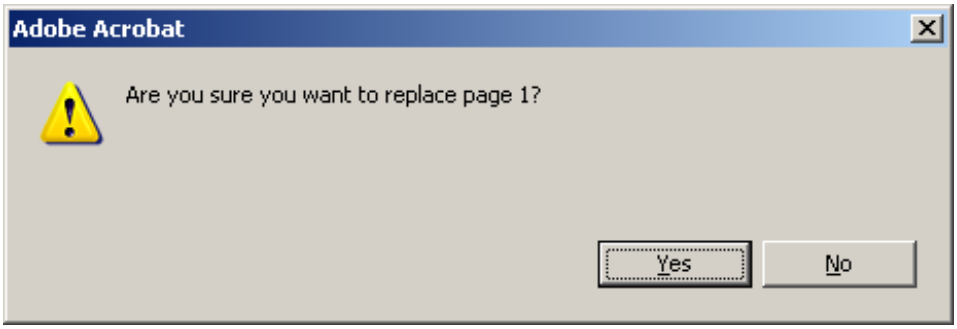


Figure 17-9: Adobe Acrobat warning dialog

Repeat for other pages if necessary.

Rotate Vertical Pages

Vertical Cross Section pages need to be rotated 90 degrees counter-clockwise so that they are printed correctly with the binding edges matching all the other pages in the plan set.

Select the *Pages* tab and locate the vertical pages (if any exist). Select the first sheet that requires rotating. While holding the *Shift* key, scroll to the last vertical page. Release the *Shift* key. Right-click on the selected pages and select **Rotate Pages…** (Figure 1-54).

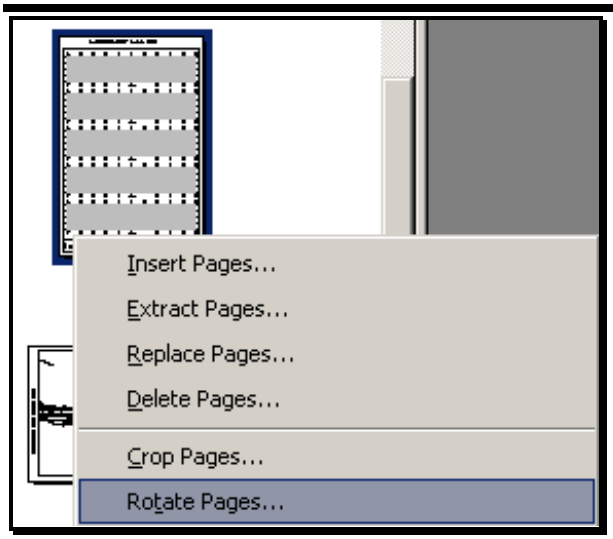


Figure 17-10: Right-click and select Rotate Pages

In the *Rotate Pages* dialog (Figure 1-55), adjust the *Direction* to **Counterclockwise 90 degrees.** Verify that the *Page Range* is set to **Selection.** Click **OK.**

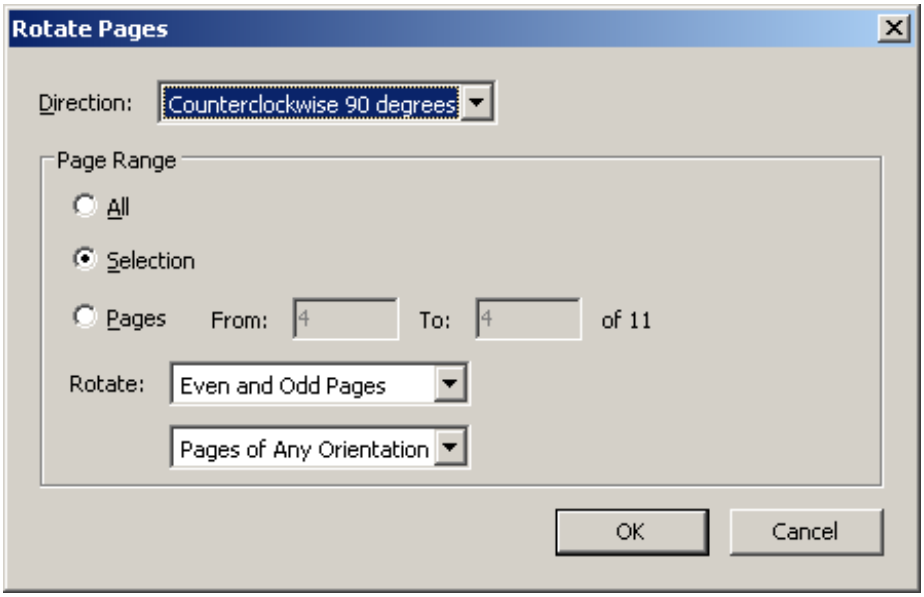


Figure 17-11: Rotate Pages dialog

Save the PDF Document

Select **File>Save** from the main menu.

Print to OCETDS800

Printing the PDF will require that the OCETDS800 has been added as one of your available printers. If it isn't, open *Windows Explorer* and browse to the \\Dot0dta1psprt02\ folder (or click the underlined link in the electronic document). Double click the **OceTDS800-Rm126** printer in the list (Figure 1-56).

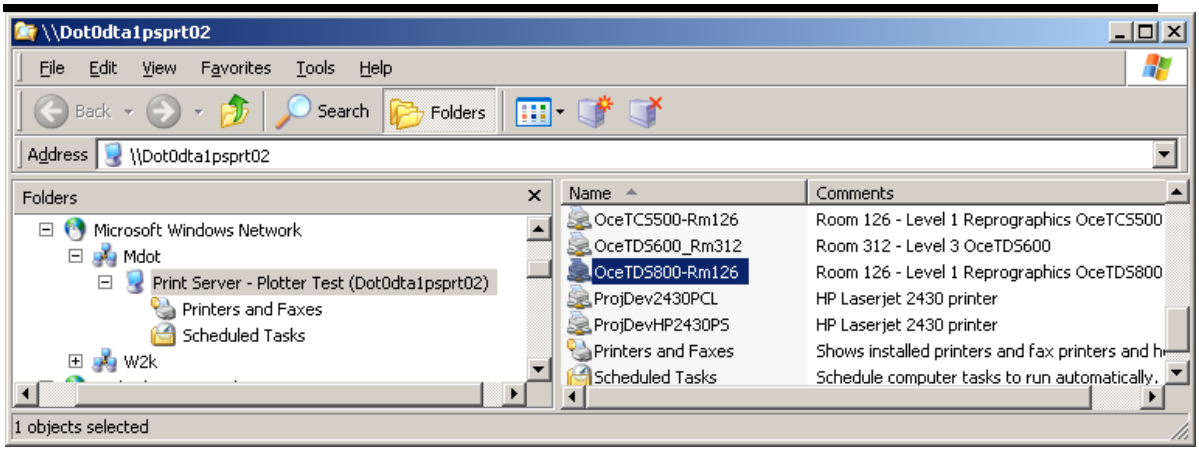


Figure 17-12: Double click the OceTDS800-Rm126 to add the printer

Open the PDF document. Select **File>Print.** Select the printer from the *Printer Name* pull down. Set the *Print Range* to **All.** Place a check mark in the **Reverse pages** box. In the *Page Handling* portion of the dialog, set the number of copies desired (if more than one, place a check mark in the collate box), set the *Page Scaling* to **None**, place a check mark in the *Auto-Rotate and Center* box and place a check mark in the *Choose Paper Source by PDF page size* box (Figure 1-57).

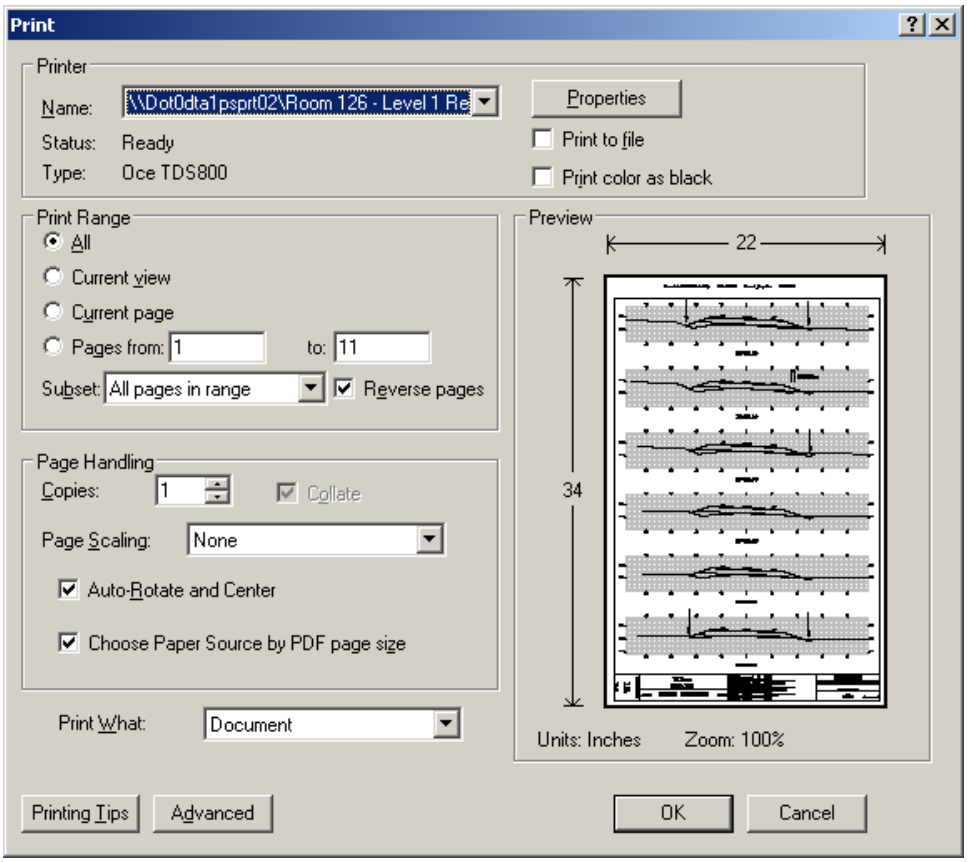


Figure 17-13: Print dialog with adjustment made for a Full Size US Customary project

Select *Properties*. Depending on whether you want a Full Size or Half size plot or whether it's a metric or U.S. Customary project, will depend on the settings you choose. Select the

Refresh button on the *Basic* tab to refresh the list of page sizes available and make the adjustments necessary.

- **Full Size U.S. Customary Project –** Set the page size to **Oce D 22x34 in.**
- **Full Size Metric Project –** Set the page size to **Oce D+ 24x36 in.**
- **Half Size U.S. Customary Project –** Set the page size to **Oce B 11x17 in.**
- **Half Size Metric Project** - Set the page size to **Oce B+ 12x18 in.**

In addition to these setting, the half size plots will need one more adjustment. Select the *Layout* tab (Figure 1-58). In the *Custom Scale* portion of the dialog, place a check mark in the *Keep Aspect Ratio* box. Adjust the *Custom Scale* to **50%.** Click **OK.**

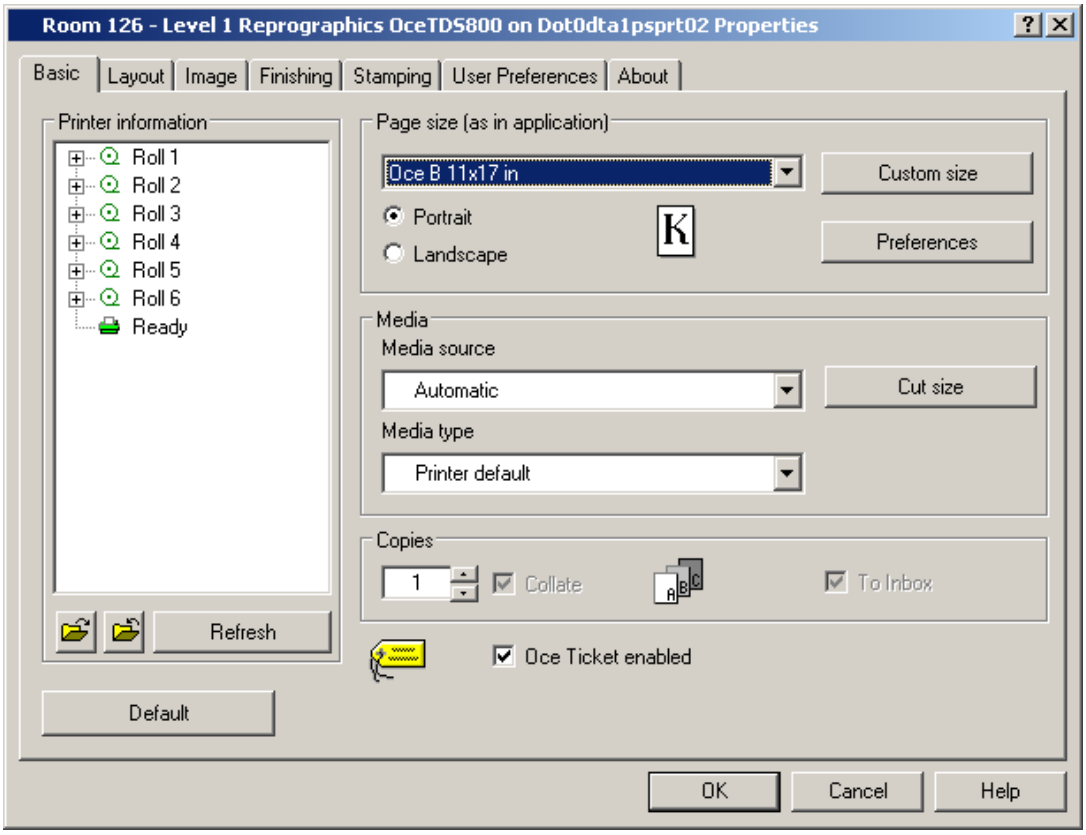


Figure 17-14: Adjusting the Custom Scale for Half size plots

The *Preview* portion of the *Print* dialog will not display the correct dimensions for a half size plot, however, the 50% scale will happen when it reaches the plotter.

Select **OK** to start printing the PDF. A progress bar will appear displaying the printing progress.

SECURE MICROSTATION DRAWINGS

ACTIVATE DESIGN HISTORY

Overview

After the PDF is created, we want to activate *Design History* on all of the files in your Workgroups MSTA directory. What this does is it establishes a point in the files that MicroStation can restore to. From this point on, anyone that makes a change in the file will need to commit their changes and document a description of the change or exit with out committing the changes. This will ensure that any unintentional changes made to any of the files can restore back to the Contract deliverables. Any changes made to the legally binding electronic drawings will need to be more deliberate.

Activating *Design History* in the drawing files will allow the use of the same set of drawing files for most of the life-cycle of a project from conception to bid letting. Way too often files get altered by the time ROW plans are shipped to the registry for recording.

- *Design History* will enable users to roll-back any changes made to a file at any point during the design process. We are enabling *Design History* at the time of plan submittal to Contracts. In the future, we may enable *Design History* in every file as a PIN is created.
  - ✓ *For more information on Design History, please refer to MicroStation Help.*

Step One: Open *Batch Process*

From the *Main Menu* select **Utilities>Batch Process…** to open the *Batch Process* dialog (Figure 17-15).

Step Two: Select Command File

We created a standard command file for the purpose of activating *Design History* for all files in your workgroup's directory after a Contract Submittal. This file also sets a description in the *Design History* that describes the milestone. Select the magnifying glass to browse to the **Set Design History.txt** *Command File.* Select it and click **OK.**

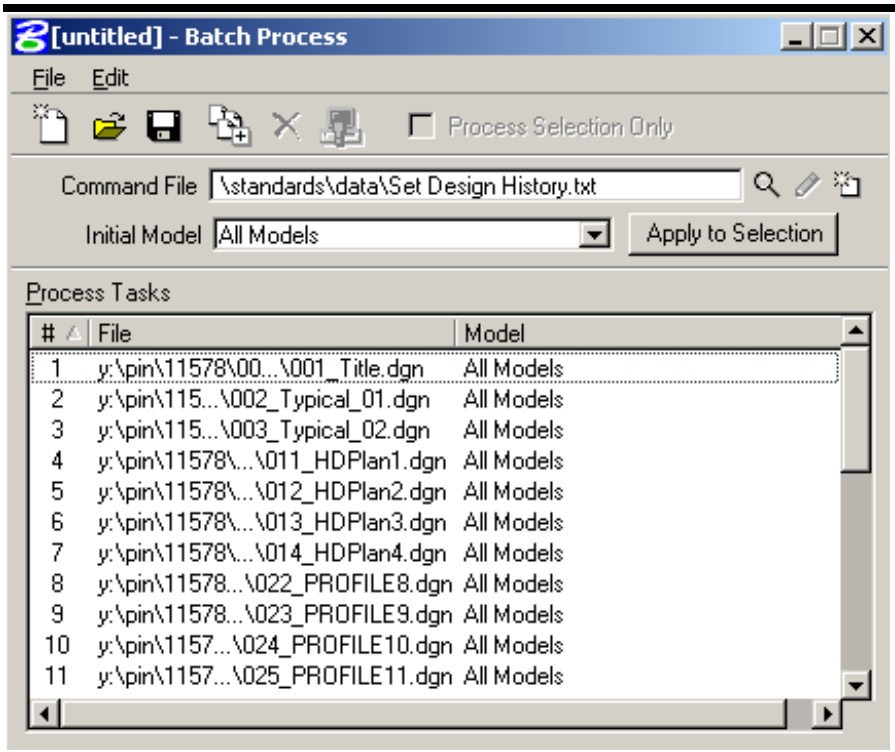


Figure 17-15: Batch Process Dialog.

Step Three: Add Files

From the *Batch Process* dialog menu, select **Edit>Add Files…** and select all MicroStation design files (.dgn's) in your workgroup's MSTA folder.

Step Four: Select All Files

Select all files in the list.

Step Five: Process Files

Select **File>Process…** from the *Batch Process* dialog or click the **Process Batch Process Job** button (Figure 17-16).

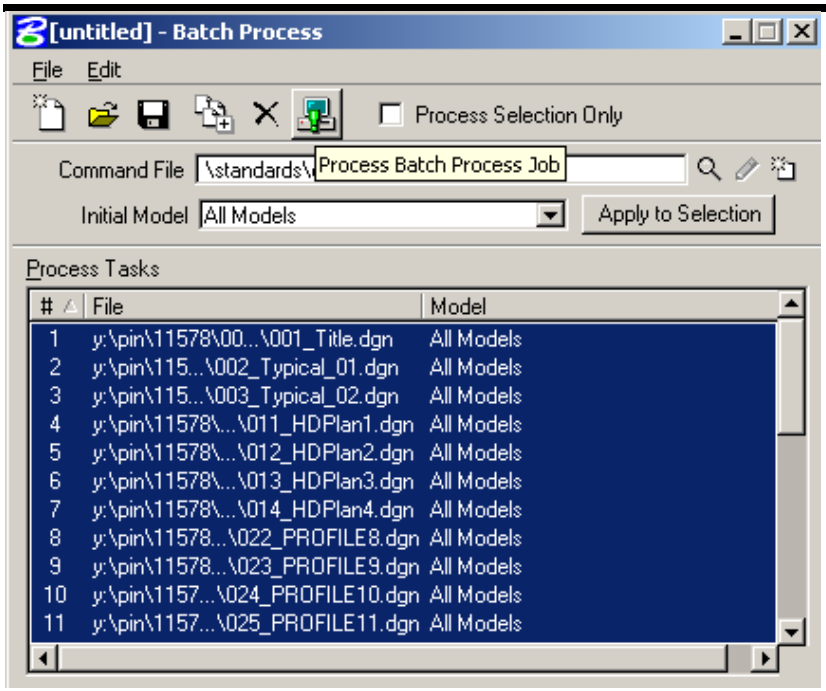


Figure 17-16: Batch Process dialog displaying Process Batch icon.

Step Six: Review Selection – Click Process

A new dialog will appear displaying all the files (Figure 17-17). Click **Process** to start the command. Each file will open and run the command specified in the command file. When the process is complete, the *Process* button will change to a *Done* button. Close the *Batch Process* dialog.

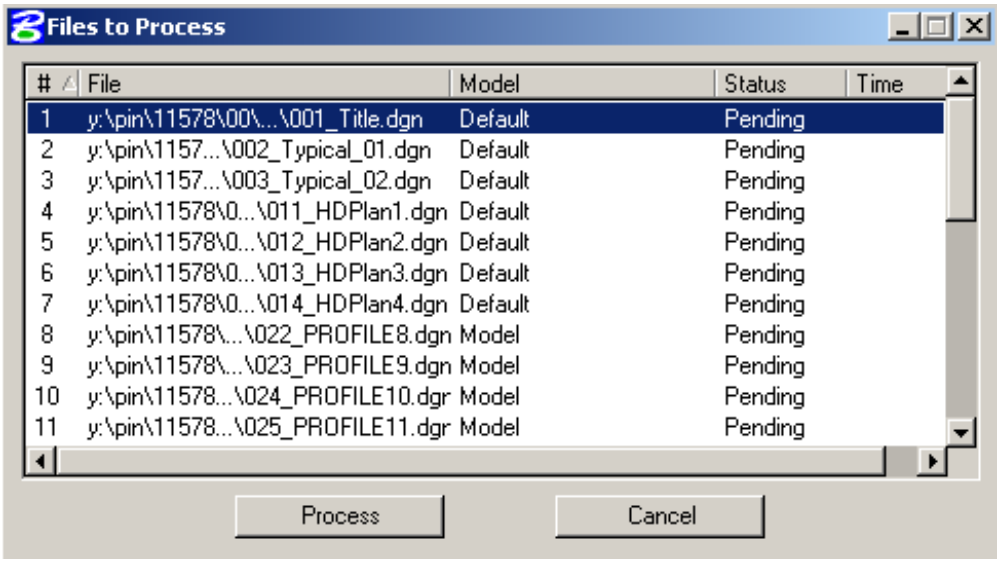


Figure 17-17: Files to process dialog.

- It is not necessary to *Save* the *Batch Process* session. This is easily created again if the need arises.

MICROSTATION PACKAGER

Overview

The *MicroStation Packager* is a utility used as a means of creating a "snapshot" of a project as it reaches a critical stage that needs to be preserved. The *Package* is a zipped copy of your original files and all reference attachments. It will compact the files into a single ".pzip" file about half the size of all files uncompressed.

- The .pzip file extension can be renamed to ".zip" and opened with any zipping software (WinZip or Windows XP's Compressed Folder Utility) if the need arose.

Step One: Start MicroStation

Launch MicroStation from the icon on your desktop or from the **Start** menu. Select your project from the *Project* pull down. Select a file in the list with a 3 digit prefix and an underscore. Click **OK.**

Step Two: Create New Package

Select **Utilities>Packager…** from MicroStation's *main menu.* This opens the *Create Package* dialog (Figure 17-18). Click **Next.**

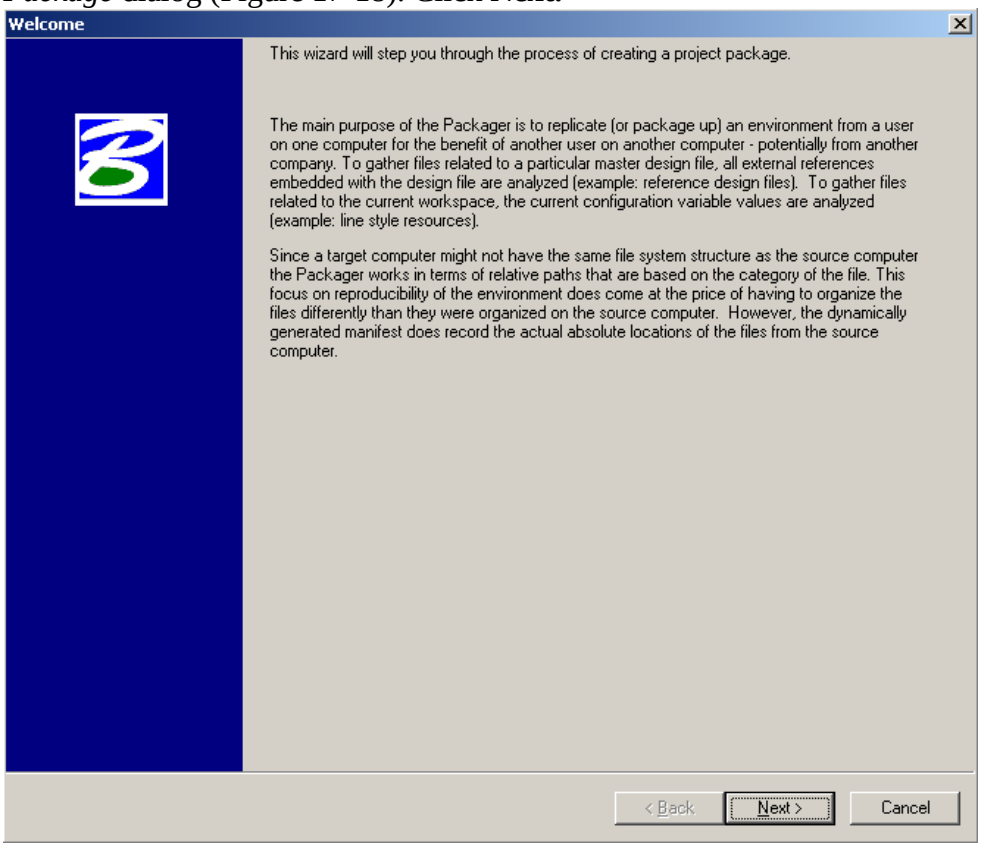


Figure 17-18: MicroStation Packager's Welcome screen.

Step Three: Enter Package Name

Use a name that will identify the project from others. A good standard to follow is PIN-SubmittalType (i.e. 12345-FinalPlans). Do not use decimals in the file name. It is not necessary to enter a description in the *Description* field, but it could be helpful to identify at which milestone it was archived (Figure 17-19). Click **Next.**

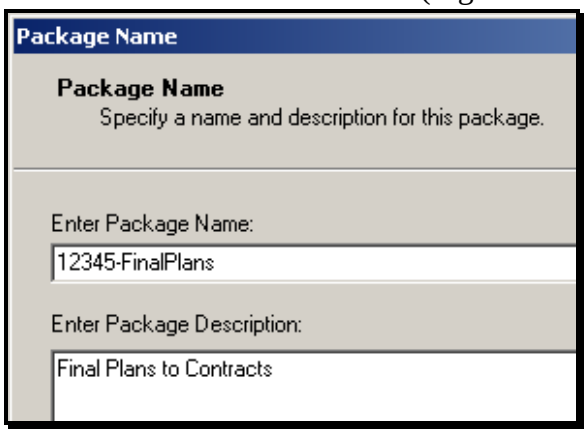


Figure 17-19: Enter the Package Name and Description

Step Four: Select Design Options

Select which design options you want to use (Figure 17-20). Normally, *Reference Files* is the only box you want to check. Click **Next.**

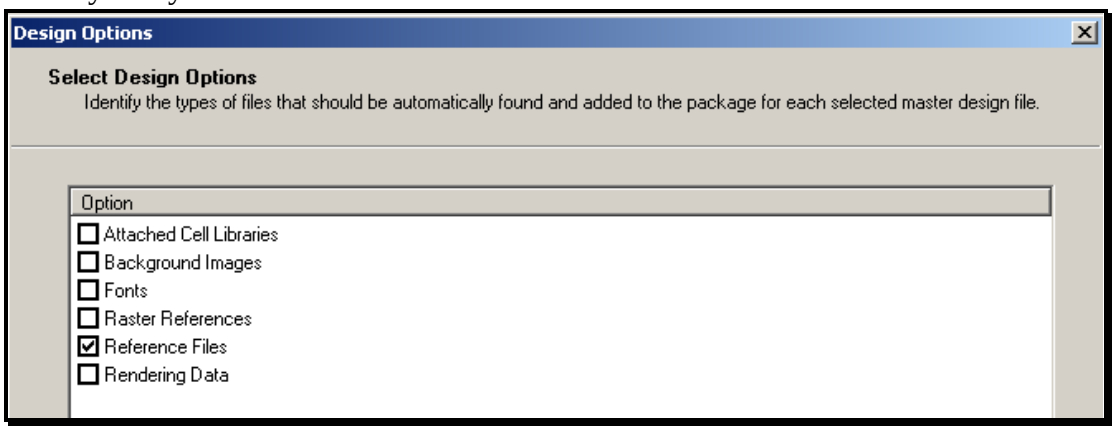


Figure 17-20: Select Reference Files as the only Design Option

Step Five: Select Project Files

The *Add Design* button allows the user to **Browse** and select the files you want to package. Select all of the 3 digit prefix files in your workgroup's MSTA directory used for the final plan set (Figure 17-21). Select **Open.**

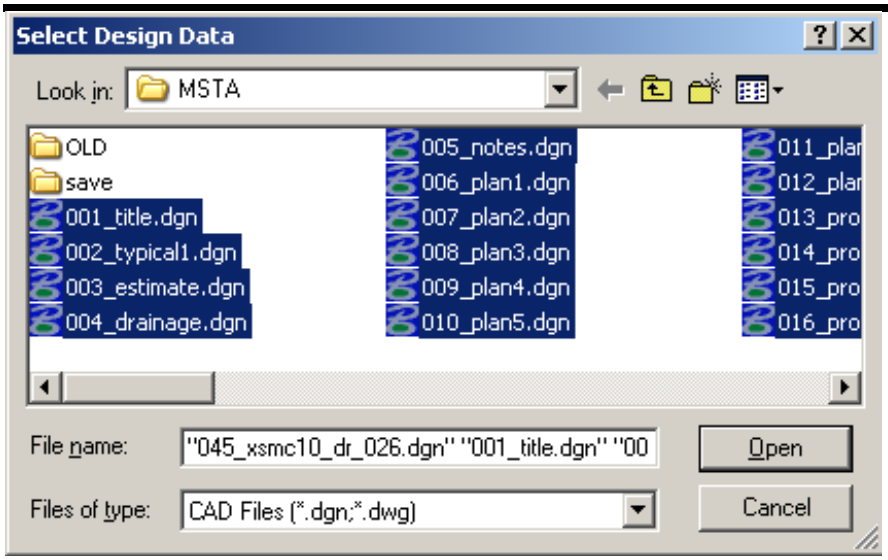


Figure 17-21: Browse and select all 3 digit prefix drawings only

Browse to the ROW/MSTA folder and select all 3 digit prefix drawings with the exception of a plan set used for presentation purposes. These are identified by a higher numbering sequence than the plan package set and are followed by the c_RWPlan root file name. If there are other workgroups submitting plans for the plan package, select these sheets also (provided that they have been numbered correctly).

Uncheck the *Recursive* option so that all files will fall within a single folder instead of reproducing the original folder structure.

Step Six: Unselect Workspace Options

Uncheck all of the *Workspace Options.*

- If the files are to be shared with a consultant that doesn't use our configuration, you may want to select all of these options. Make your selection and click **Next**.

Step Seven: Review Selections

This is the last opportunity to change your selection. You can still select the *Back* button to go back through the steps. A few extra files get generated automatically. Do not delete these files. If all looks good, click **Next**.

Step Eight: Package Options

This step gives you the opportunity to adjust the location of the package file. The defaults are usually good unless you want to change the path to another folder location. Place a check in the *Retain Design History* box if not already checked. Click **Next**.

Step Nine: Finish

Click *Finish* to begin the *Packaging* process.

✓ *For more detailed instructions on the MicroStation Packager, please refer to page 17-22.*

Step Ten: Extract Archive to Contracts Folder

Once the *Package* has been created it needs be extracted to your PIN's \Contracts folder. This will provide Contracts with the drawings that are needed to be archived into *Digital InterPlot* for future document retrieval via the intranet Webpage. Using *Windows Explorer*, locate the MicroStation *Package (.pzip)* file that should be in your workgroups MSTA folder (i.e. 12345-FinalPlans.pzip). Double-click the file and you will see a dialog describing the package. Adjust the "Extract To Directory" path by clicking the *Browse* button. Set the path to your PIN's \Contract folder. Click **Extract** and you will be prompted to "*Launch MicroStation?"* Select ***NO***.

Step Eleven: Notify Contracts

Once the files are extracted to the *Contracts* folder, notify someone in that section so they can apply proper permissions to the folder to prevent accidental editing of the final contract plans.

Chapter 18 Changes During Advertising (Amendments)

WORKING WITH AMENDMENTS

AMENDMENTS OVERVIEW

Overview

Occasionally revisions need to be made to the plans after the contract has been advertised. Sometimes the problem can be remedied by an Amendment to the contract book, other times the change(s) needs to be made on the plans. This portion of the manual will instruct users on how to deal with these changes or Addendums which are now being called Amendments.

Edits

It is necessary to "cross out" graphics and notes for all items that have changed. New features will be entered using the *Settings Manager* as normal workflow dictates. A revision triangle should be added with a revision cloud if necessary so that all changes are apparent to those who have the original set of plans. If the compounded changes result in obliteration of the sheet, the word VOID should be written across the page and a full replacement sheet provided.

Incrementing Sheets

All sheets that have been changed will have a new sheet designation. This is done by adding a letter suffix to the original sheet number in the bottom right hand corner of the sheet and the actual filename. If the original sheet number was 3, then the revised sheet number will be 3A. Likewise, if the original filename was 003_Typical02.dgn, then the new filename will be 003A_Typical02.dgn.

Place Copies with Originals

When the Amendments are complete, only the files adjusted will be copied into the CONTRACTS folder with the rest of the Contract Plans for the project.

USE FILES IN WORKGROUP'S MSTA FOLDER

Overview

Users should always use the "Legally Binding" original set of drawings that were printed for the bidding process. Working on the files requires that the original set were unaltered since the final printing. The potential of someone editing or adjusting a file since the final printing is high. By applying *Design History* to all files in the workgroup's MSTA directory, this gives users a record of changes to any given file (if any were made) and the opportunity to undo those changes resorting back to the original set at time of Final Plans. If a file has been altered since it was printed, the user will receive a warning saying that someone else has not committed changes to the file, would you like to take over the changes. The user may review the *Design History* to view a description of changes made if someone made a change deliberately. The user can determine what changes have been made and visually see and undo the changes. Likewise, when a user consciously makes a change considered to be an Amendment, they are prompted to enter a short description of the change.

If the user doesn't want to rely on these files because too many changes may have been made, the .pzip can be re-extracted into the workgroup's MSTA directory to recover the original files. This places all original files needed to re-generate the final plans into a sub folder. A restore can also be done from backup tapes if necessary.

- ✓ *For more information on Design History, please refer to MicroStation's internal HELP.*

Saving the Files – Commit Design Changes

When a user exits a file that has been edited, the *Commit Changes* dialog opens waiting for a description of the change (Figure 18-1). It's a must to enter a brief description. If the user plans on making many changes and wants to enter the description later, he or she can select *Cancel* and still save the changes to the file. Remember to return to the file and make a note of the overall changes.

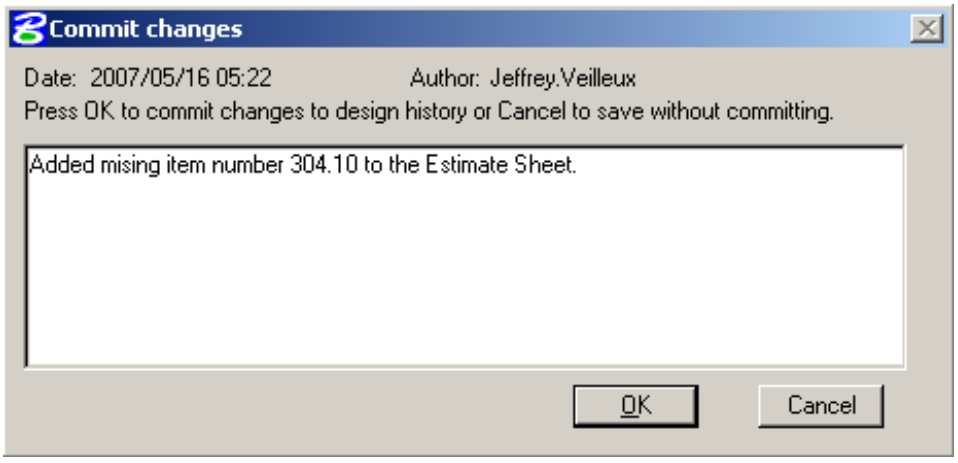


Figure 18-1: Add a brief description to the Commit Changes dialog

- If users have their *Preference* set so that they *Save Settings on Exit*, they will receive this message regardless if a change has been made to the file. Consider removing this preference by selecting **Workspace>Preferences** from the MicroStation main menu and adjusting the *Operation* category by un-checking the *Save Settings on Exit* option.

Adding Elements with the Settings Manager

Make all the changes that are needed as you normally would during the design phase within the proposed design files (i.e. Highway, Bridge, Alignment, etc.).

Some additional cells (Revision Triangles), linestyles (Cross Outs and Revision Clouds) and text (Revision Text) have been added to help the changes stand out from original data. These items, when printed in color, will be printed green.

- When editing the sheet files (files beginning with a 3 digit prefix) remember that some sheets do not contain any editable graphics besides the border elements. These will be the "plan view" Sheets, Geometric Sheets (Curb Layout Sheets) and Structural Detail sheets. The "plan area" visible in Plan Sheets actually reside in other files. These changes will need to be made in the proposed design file(s) (i.e. Bridge.dgn, Highway.dgn, Multimode.dgn, Alignments.dgn, etc.). Structural details usually reside in a "z_" file.

Add Revision Triangles

Overview

If changes span a number of plan sheets, each and every sheet affected by the change needs to have a revision triangle, date, description and initials. If the change on a "plan view" sheet can be handled with a note or additional graphics, then it would be OK to work on the individual plan sheet drawings.

Revision Triangles

Each collective change that is made needs to be marked with a triangle that is numbered. If a new cross pipe is added to a project, the numbered triangle that represents the change in plan view is the same number that will be used on the Cross Section, Estimate Sheet and Drainage Sheet for that specific change. Each of the respected sheets needs the triangle label. If Riprap is also added to the pipe ends, this item will also use the same numbering as the plan view drawing. If a ditch, driveway, catch basin is relocated a new number is assigned to the triangle. From the *Settings Manager* select **Symbols & Linestyles>Revision Triangle (Large)** to label the area in the drawing and select **Symbols & Linestyles>Revision Triangle (Title Block)** to place a triangle in the Signature Blocks. Select **Qualities>Drop>Complex (Cell, Chain, etc.)** from the *Main Menu* and left-click on the triangle, and left-click again any where in the view to *Accept* the command. Use the *Edit Text* tool or select **Text>Edit Text** from the *Main Menu* to edit the text within the revision triangle.

Revision Clouds

A revision "cloud" can also be used to better display the area that has changed if it isn't completely apparent with just a revision triangle. Place revision clouds from the *Settings Manager* by selecting **Symbols & Linestyles>Revision Cloud** and left-click to place a shape encompassing the area of change.

Signature Blocks

Every file in the list with a 3 digit prefix has a border with a signature block. U.S. Customary borders have been expanded to accommodate more revisions whether they are Amendments or As-builts. There are lines in the signature block dedicated to revisions and a single box for Field Changes (Figure 18-2). The Field Changes section is reserved for the governing signatures of the revisions. This is where the Project Manager, Asst. Project Manager or Resident would sign the plans as final approval of the As-built plans.

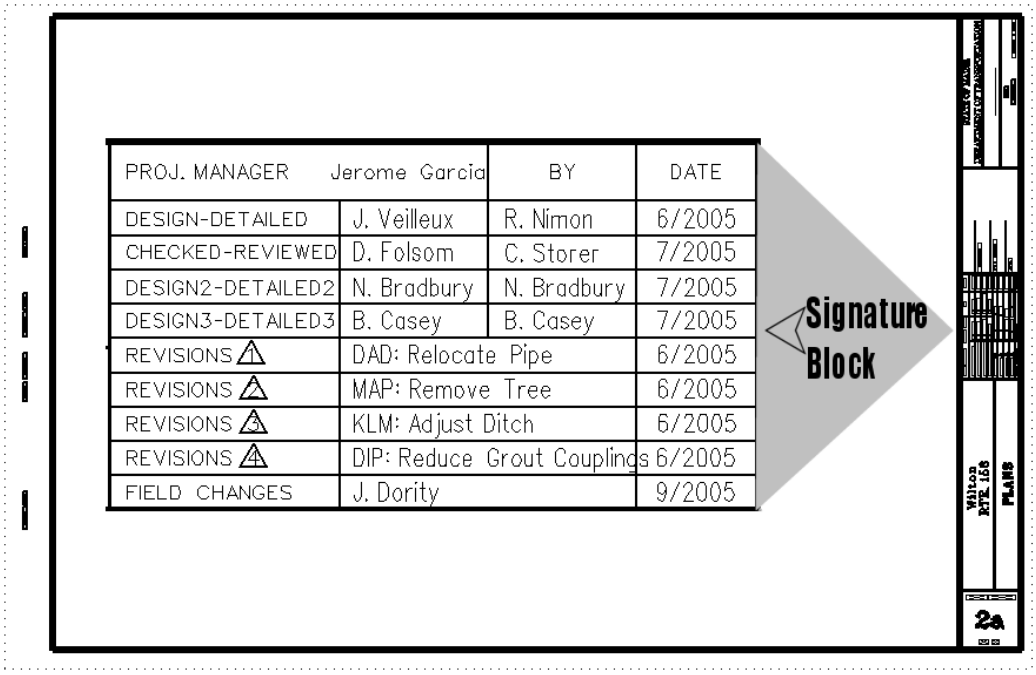


Figure 18-2: US Customary signature block with revision triangles

Metric plan sets may require an expansion to the signature block to cover the revisions (Figure 18-3). Use a variety of MicroStation tools to accomplish this.

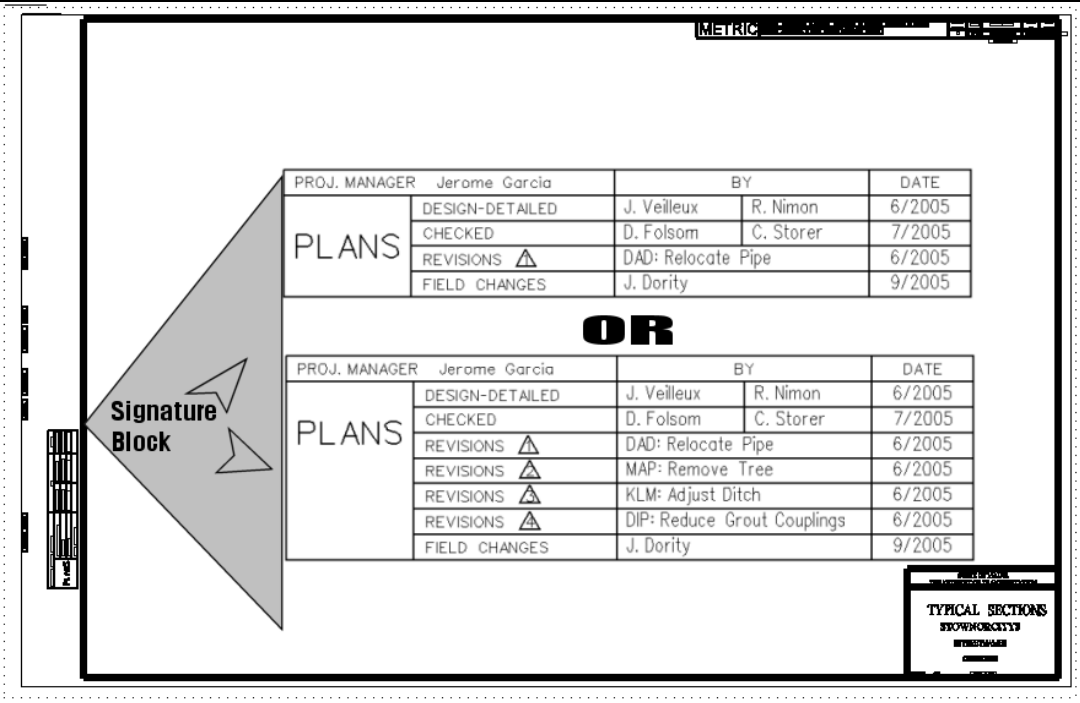


Figure 18-3: Metric signature block - before and after expanding

Additional Sheets

When a new sheet needs to be added into the plan package, whether it's a full replacement or a sheet unintentionally left out, it should fall after the sheet that it normally would and labeled using the letter "A" as an increment to the sheet number (i.e. 11A). The file name will also use the letter "A" as an increment (011A_HDPlan01.dgn).

Rename and Copy Files to Contracts Folder

Part One: Rename Sheets That Contain Changes

Once all the changes to the plan set have been made, and all sheets have been labeled with revision triangles and page numbering updated, open *Windows Explorer* and manually add the letter suffix to the filenames of any sheet that has a revision (i.e. 011A_HDPlan01.dgn, 101A_XSMC10_dr_001.dgn, etc.). Do not change the file extension or rename a file without a border, only a 3 digit prefix drawing.

ⓘ ***Do not rename any other files besides the sheet type drawings. These are the drawings that begin with a 3 digit prefix followed by an underscore. Do not rename "z_" files or the state plane correct files (i.e. highway.dgn, bridge.dgn, alignments.dgn, etc) as their standard file names are important to maintain.***

Copy Files into Contracts Folder

Notify the Contract Section that the Amendments have been made. They may need to adjust permissions to allow you to place the new files into the CONTRACTS folder of the PIN.

Select all new sheet files that have changed. They all will have a letter "A" as the suffix on the sheet number. Select all the additional drawings that have had changes made to them. These additional may be files such as Bridge.dgn, Highway.dgn, Rwplan.dgn, Alignments.dgn, etc. Viewing the modified date on the files may help you tell the difference.

Once all the files that have had revisions have been selected, select **Edit>Copy** from the menu. Browse to the CONTRACTS folder within your PIN (i.e. CONTRACTS\Workspace\Projects\12671_FinalPlans\dgn). Select **Edit>Paste** from the menu. You will be prompted to overwrite some files. Select **Yes.**

Batch Printing to a Multi-page PDF

All Amendments needs to be mailed out to all original bidders and added to the web page for on-line bidding. Using MicroStation's *Batch Print/Plot Utility,* select all of the revised sheets and print them to a new multi page PDF file. Browse to the **CONTRACTS** folder and supply a standard name that includes the **PIN-Amendments01.pdf** (i.e. 12345-Amendments01.pdf) to describe the new document. Notify the Reproduction staff that the Amendments are available for printing.

✓ *Refer to page 17-10 for detailed instructions on creating a multi-page PDF.*

Print Amendments

The Amendment plans can be printed a variety of ways, but are most efficiently printed from the PDF document to the OCETDS800 by the Reproduction staff or anyone with Adobe writer software. Rotation of the Vertical Cross Sections may be necessary.

✓ *Refer to page 17-13 for instructions on printing the multi-page PDF.*

Chapter 19 As Built Drawings

CHANGE ORDERS/AS BUILTS

OVERVIEW

Overview

A *Change Order* is issued when changes are needed on the plan set during the Construction phase of your project. This *Change Order* may require re-engineering a structure, retaining wall or other detail. Because this project has already been awarded, the revisions made to the plan set now will be considered **As-Built plan work**. The work performed on the files will be done in the Const/MSTA folder as a standard.

The electronic As-Built drawings will be printed using the MicroStation drawings directly into the *Digital InterPlot Archive* and will be printed in color. When printed, all As-Built elements will be red, any Amendments will be printed green, existing topography will be gray, and the design and Right of Way elements will be black.

Some final "paper As-Builts" may not get transferred into electronic As-Builts, but if they are done using the same concepts and written with RED ink or dark RED pencil, they can be scanned in color and placed into the *Digital InterPlot Archive.* The end product of either a scanned paper or an electronic As-Built will be nearly identical when view through a web browser.

- Until electronic signatures are accepted by MaineDOT's Legal Division and the State's Archivist, plan sheets that require an Engineer's stamp and signature will need to be hand editing (using red pen or dark red pencil) and re-scanned to preserve the legal binding document. When the multi-page PDF is created from the electronic CADD files, the sheets that have been re-scanned can replace the sheets without signatures.

RETRIEVE THE LATEST PLAN SET

Overview

To work on the plans for a *Change Order*, we want to start off with the latest plan set. If previous steps are followed properly, the CONTRACTS folder should contain the latest plan set with the latest revisions (Amendments). These files will be copied into the Const/MSTA folder.

Copy Contracts Folder Contents to Const/MSTA Folder

Using *Windows Explorer*, browse to your projects CONTRACTS folder and browse internally to the MicroStation files (i.e. CONTRACTS\Workspace\Projects\PIN_FinalPlans\dgn). Select all of the files in this folder. Select **Edit>Copy.** Browse to your PIN's Const/MSTA folder. Select **Edit>Paste.**

End Result

Use the documentation that follows to make the edits for the Change Order. The end result will be all contract plans will exist in the CONTRACTS folder and all of the Change Orders/As-Built plans will exist in the CONST/MSTA folder for ease of Archiving through *Digital InterPlot*.

CHANGE ORDER/AS BUILT GENERAL WORKFLOW

Overview

The files adjusted will be considered the start of As-Builts for the project. Each change will be labeled with a revision triangle, encompassed with a revision cloud if necessary for clarity and the border initialized with a short description of the change, revision number and date.

An As-Built *Settings Manager* (Settings>DOT Setmgrs>As-Builts>Type) has been created to help users standardize the *Level* in which new elements are placed for symbology purposes**.**

Launch MicroStation

Launch MicroStation from the icon on your desktop or from the **Start** menu. In the *Workspace* portion of the dialog, use the pull-down next to the *User* and select **As-builts.** This will point you to the Const/MSTA folder of the PIN you pick from the *Project* pull-down. Pick your PIN from the *Project* pull down. Verify that you are now pointing to the path to your PIN's Const/MSTA folder.

As-Built Settings Manager

We have an As-Built *Settings Manager* that will be used when conducting Change Order/As-Built mark-ups. This will automatically load based on the *User* selection being set to As-Builts. The As-Built work done on the paper copy of the plan set will be reproduced using the *Settings Manager* and a combination of MicroStation tools.

MAKING CORRECTIONS

Overview

This section of the manual was interpreted from a Construction Manual dated 2002. We will use these guidelines for doing As-Builts on paper or electronically using our CADD package.

An extra set of full size plans will be furnished to the Resident for use as As-Built plans. The Resident may request an additional set of plans from the MaineDOT's reproduction room for As-Builts if needed. Preparation of As-Built plans done on paper shall be done using RED pen or DARK RED pencil only. The As-Built plans shall be an exact representation of the completed work. All revised plan sheets and sheets with no change must be included in the complete As-Built plan set. The Estimate Sheet needs to be corrected to show the Final Quantities including additional items of work.

Saving the Files – Commit Design Changes

When a user exits a file that has been edited, the *Commit Changes* dialog opens waiting for a description of the change (Figure 19-1). It's a must to enter a brief description. If the user plans on making many changes and wants to enter the description later, he or she can select *Cancel* and still save the changes to the file. Remember to return to the file and make a note of the overall changes.

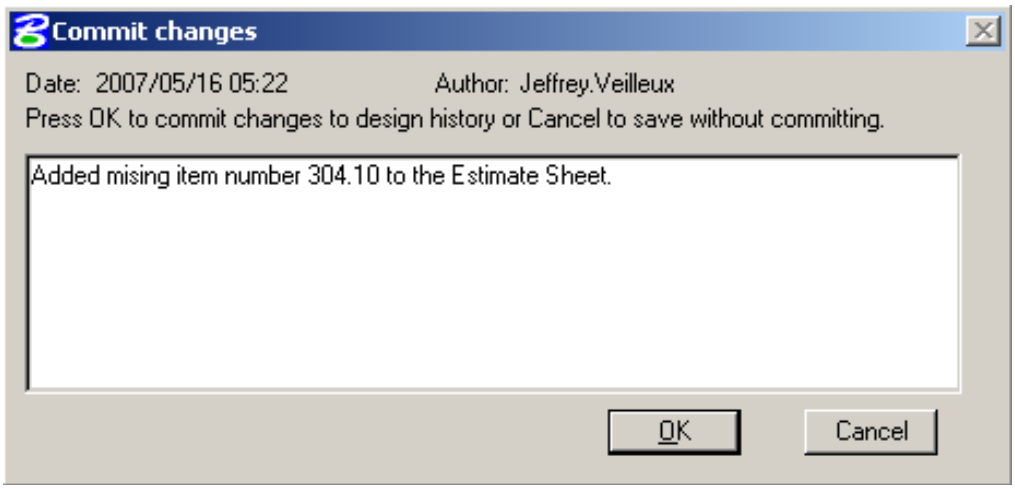


Figure 19-1: Add a brief description to the Commit Changes dialog

- ✓ *For more information on Design History, please refer to MicroStation's internal HELP.*

♫ If a user has their *Preference* set so that they *Save Settings on Exit*, they will receive this message regardless if a change has been made to the file. Consider removing this preference by selecting **Workspace>Preferences** from the MicroStation main menu and adjusting the *Operation* category by un-checking the *Save Settings on Exit* option.

Title Sheet/Others

Updating Sheets with Signatures

Some sheets in the plan set may have required signatures and stamps by an Engineer. These sheets will require hand written adjustments in either red pen or dark red pencil.

The title sheet shall bear the following label in some convenient blank space: AS-BUILT PLANS. The initial box will also include who the work performed by (Contractor, if more than one contract has been let to complete the work, list all prime contractors), the person who prepared the As-Builts (listed in the Revisions box) and the approving signature by the Project Manager in the FIELD CHANGES section.

Scan the Sheets

These sheets will need to be re-scanned by the Reproduction staff directly to individual PDFs and placed into the CONST\MSTA folder. They will need to be included in the As-Built multi-page PDF document.

- This process will be required until electronic signatures are accepted by the Legal department and the State's Archivist.

Editing the Proposed Design

Overview

Lines, dimensions and notations shown in the original plans which have been eliminated or corrected shall be "X ed" (crossed out) and encompassed with a revision cloud. The As-Built *Settings Manager* contains the same tools and settings that a detailer or designer used throughout the life cycle of a design with the addition of some *Linestyles and Symbols* to help standardize the look of As-Built drawings. Select **Symbols and Linestyles** from the left side of the *Settings Manager* and select one of the components needed from the right.

Adding "As Built" Elements

In the past, dashed lines were used to indicate any as-built lines, dimensions, or tie points which do not conform to the original plans. Now, all As-Built lines will look identical to the previous work done with the exception of its *Color (red)* and the *Level (As-Builts).* These things may not be evident when looking and working on the As-Builts, but they will be when they are plotted in color to the web archive. *Level Symbology* can be used to better display the corrected colors when working on the files.

When correcting a cross pipe for example, a 2' x 65' 8" (600 mm x 20.0 m) pipe culvert was constructed at Station 103+50, whereas the plans called for a 2' x 63'-3" (600 mm x 19.25 m) pipe culvert at Station 101+50. The culvert line and the notations describing the work at Station 101+50 shall be "X ed" (crossed out). In striking out figures and notations, care should be used to avoid obliterating the original figures. From the *Settings Manager,* select **Symbols and Linestyles>Cross Out Linestyle** to place a series of "X"s over an existing element whether lines or text. The new As-Built culvert and corrected description notation should be shown at Station 103+50 by using the **As-Built** *Settings Manager* for electronic As-Builts or red ink (or dark red pencil) for paper As-Builts. A revision triangle will be added and possibly a revision cloud to better display the area that has changed.

Revision Clouds

A revision "cloud" can be used to better display the area that has changed if it isn't completely apparent with a revision triangle. From the *Settings Manager,* select **Symbols**

and Linestyles>Revision Cloud to place a cloud around a change to help make it apparent to anyone reviewing the plans.

Revision Triangles

From the *Settings Manager,* select **Symbols and Linestyles>As-Built Triangle (Large)** and place a revision triangle in a visible location near the change or the cloud if one is necessary. Use **Qualities>Drop>Complex** from the main menu to drop the triangular cell and the *Edit Text* tool or **Text>Edit Text** from the main menu to edit the text in the cell to the desired number sequence. Each collective change that is made needs to be marked with a triangle that is numbered. If a pipe is added to a project, the numbered triangle that represents the change in plan view is the same number that will be used on the Cross Section, Estimate Sheet and Drainage Sheet. Each of the respected sheets needs the triangle label. If Riprap is also added to the pipe ends, this item will also use the same numbering as the plan view drawing. If a ditch, driveway or catch basin is relocated, a new number is assigned to the triangle.

Mandatory Inclusion List

Grading:

1. All changes in alignment.
2. All equations in stationing used during construction.
3. ?All permanent references for control points. Also, all control points required to establish centerline shall be perpetuated. Brass caps and pipe are available for this.
4. All changes in grade lines and elevations.
5. Locations and elevations of all benchmarks used during construction or permanently established in taking final cross sections. Permanent benchmark should be identified by the word "Permanent'. Benchmarks shall be established at box culverts, bridges and other locations where they may be considered permanent.
6. Location and number stamped on brass disc of all Government Survey benchmarks. The elevation based on the project level datum, if available.
7. ?Location of all Right-of-Way markers installed.
8. Location of all land corner witnesses, existing, or installed by the Project Manager.
9. Location of all farm entrances constructed showing lengths, diameters and type of culverts laid or re-laid.
10. Location of limits of construction of all borrow pits, channel changes, dikes, intercepting ditches, etc., outside the Right-of-Way not covered by extended roadway cross sections. The stationing and location of the base line with respect to the project centerline shall also be shown.

Culverts:

1. All changes in location.
2. All changes in lengths or dimensions.
3. The type of pipe installed (CMP, RCP, etc.).

Bridges and Special Culverts:

1. All changes in stationing.
2. All changes in design.
3. All revised dimensions.
4. Deck and bridge seat elevation of bridges.
5. Maximum and minimum length of piling in each footing.
6. The description, location and elevation of all permanent benchmarks.

Surfacing:

1. Beginning and ending stationing of each type and width of surfacing constructed.
2. Location of all option pits used in connection with the construction of the project. If any plan pits are not used, designate by the words "Not Used".

Initial Borders

Every file in the list with a 3 digit prefix has a border with an initial box. For U.S. Customary projects, the initial box has been expanded to accommodate more revisions whether there are Amendments or As-builts. Currently we have lines in the initial box dedicated to revisions and a single box for Field Changes (Figure 19-2). The Field Changes section is reserved for the governing signatures of the revisions. This is where the Project Manager, Asst. Project Manager or Resident would sign the plans as final approval of the As-built plans. From the *Settings Manager*, select **Symbols and Linestyles>As-Built Triangle (Title Block)** to place a triangle in the *Signature Block* of the plan sheet. Use **Qualities>Drop>Complex** from the main menu to drop the triangular cell and the *Edit Text* tool or **Text>Edit Text** from the main menu to edit the text in the cell to the desired number sequence. Enter your initials and a brief description of the change.

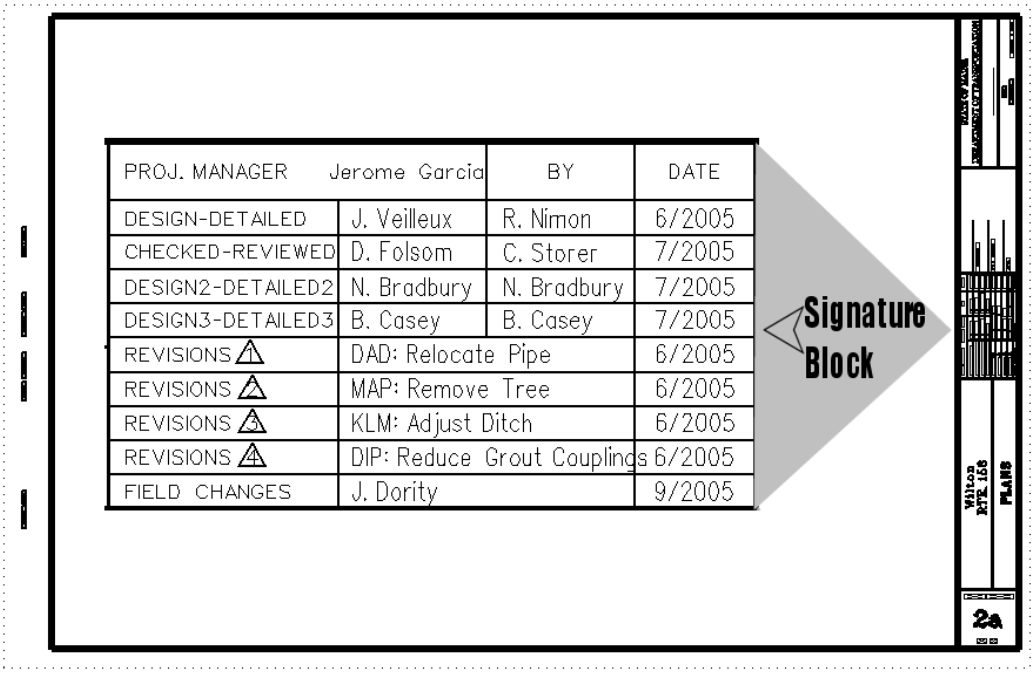


Figure 19-2: US Customary signature block

Metric plan sets may require an expansion to the initial box to cover the revisions (Figure 19-3).

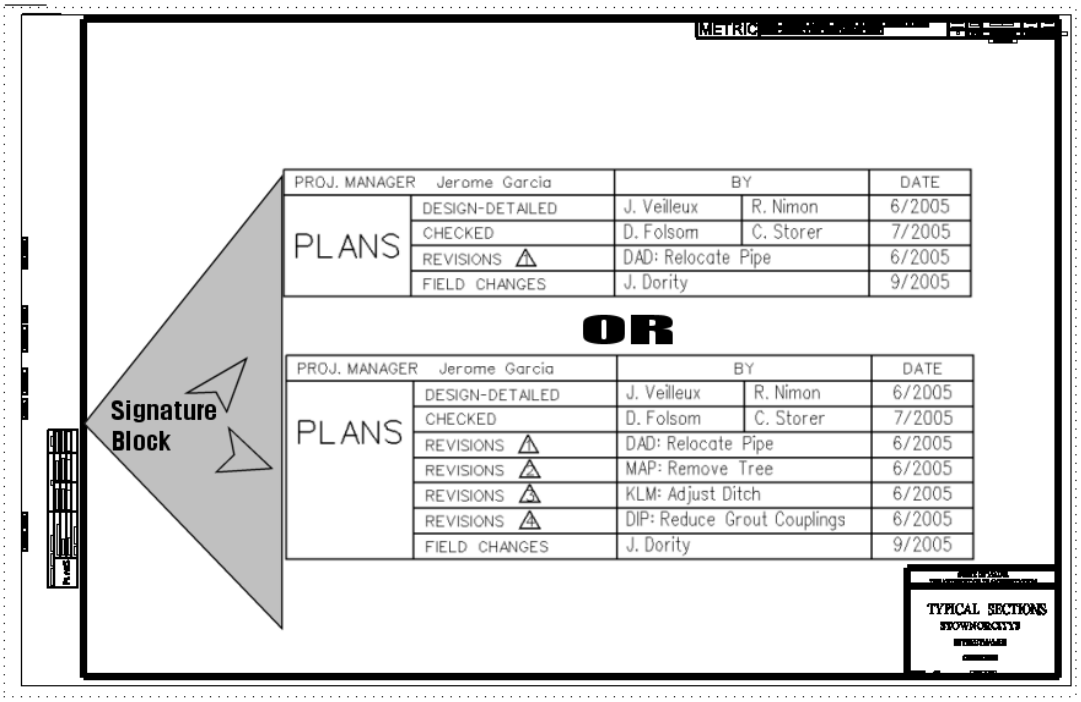


Figure 19-3: Metric signature block

Renaming the Drawing Files

All sheets that have been changed will have a new sheet designation. This is done by adding a letter suffix to the original sheet number in the bottom right hand corner of the sheet and the actual filename. If the original sheet number was 3, then the revised sheet number will be 3A. Likewise, if the original filename was 003_Typical02.dgn, then the new filename will be 003A_Typical02.dgn.

ⓘ ***Do not rename any other files besides the sheet type drawings. These are the drawings that begin with a 3 digit prefix followed by an underscore. Do not rename "z_" files or the state plane correct files (i.e. highway.dgn, bridge.dgn, alignments.dgn, etc) as their standard file names are important to maintain.***

Batch Printing to a Multi-page PDF

Using MicroStation's *Batch Print/Plot Utility*, select all of the sheets (3 digit prefix drawings) and print them to a new multi page PDF file using the **pdf_ColorFull** plot driver and the **As-Built** *pentable.* Supply a standard name that includes the PIN-As-Builts (i.e. 12345-As-Builts.pdf) to describe the new document.

✓ *Refer to page 17-10 for detailed instructions on creating a multi-page PDF. Use the settings described above to create the color PDF.*

♫ Any sheets requiring an Engineer's stamp and signature will need to replace non-signed sheets in the PDF document (i.e. 001_Title, others that require stamp).

Stamped and signed sheets will need to be replaced and vertical cross sections rotated by the Reproduction staff or someone with the Adobe writer software.

✓ *Refer to page 17-13 for instructions replacing sheets, rotating vertical cross sections, and printing the multi-page PDF.*

Printing As-Builts

Hand written As-Builts

These As-Builts can be scanned and re-produced by the Reproduction staff. These can eventually be added into the E-Plans Archive through *Digital InterPlot* and reproduced at a later date.

Printing (No Signatures)

The As-Builts can be printed directly from MicroStation to a variety of color plotters, however the pages will lack the signatures and stamps. The OCETCS500 plotter located in the Reproduction room is an available plotter from within MicroStation.

Official Electronic As-Builts (with Signatures)

Once the PDF has been adjusted by replacing sheets with stamps and signatures and rotating vertical pages, it is ready for reproduction.

The As-Builts can be most efficiently reproduced from the PDF document to the **OCETCS500** by the Reproduction staff. The OCETCS500 plotter produces a high quality print in less time than any other color plotters we currently have available. Printing the **color** PDF will require that the OCETCS500 has been added as one of your available printers. If it isn't, open *Windows Explorer* and browse to the \\Dot0dta1psprt02\ folder (or click the underlined link in the electronic document). Double click the **OceTCS500-Rm126** printer in the list.

Create a MicroStation Package

Use the MicroStation *Packager* to create a new package of the As-Built drawings using the standard file name PIN-As-Builts (i.e. 12345-As-Builts.pzip).

✓ *Refer to page 17-22 for detailed instructions on creating a package.*

Final Review

The final review will be performed. After the final review is completed, the specified sheets or complete copies, as requested by the District, will be copied in half-size sets. The copies will be returned to the District within three (3) to four (4) weeks after submittal to the Project Manager (Is this still done? What District?). Consider sending a Portable plan sets from Digital InterPlot.

Distribution of Plans

The As Builts will be submitted to the Project Manager with the final records for filing with notification of the number of complete copies or specified sheets desired.

Cities, counties, etc. that have money involved or a special interest in the project will be asked by the Project Manager if they need/want a complete copy of the As Builts or only

specified sheets. Electronic copies will be available as *Portable Plan* sets from *Digital InterPlot* once the As-Built archive is complete.

Submit a copy of the As Builts to the Transportation Planning Division for their use. (Is this still done?) Upon completion of their work, the Transportation Planning Division will periodically return the full-size As Builts to the District, via truck.

Lighting and Signals - On all roadway lighting and signal projects, a set of "as-builts" will be prepared, pertinent to the wiring alignment, showing the exact location of conduit or cable runs, pull boxes, and any other information which would be beneficial in case of maintenance problems or construction activities in the area. When "as-builts" are submitted to the agency at the time the agency is notified by letter of the acceptance of the installation and to assume the maintenance.

Chapter 20 Digital InterPlot

USING MDOT E-PLANS ARCHIVE

ABOUT THE E-PLANS ARCHIVE

Overview

The *E-Plans Archive* is MaineDOT's Electronic Plans Archive. It is a web-based, large format document management system similar to TEDOCS. The software powering the web archive is called *Digital InterPlot,* which is a product of Bentley Systems, Inc (the owners of MicroStation, InRoads and MX). *Digital InterPlot* (D.I.) is available to all MaineDOT employees who have access to the Intranet. Users can search for projects based on over a dozen filtering options and print them if necessary. The *E-Plans Archive* is currently organized in categories such as Vault Plans and Property Plans (R/W). There may be additional categories in the future. D.I. may also facilitate in producing an electronic set of plans for the on-line bidding process available to Contractors on the Internet. You can access D.I. by clicking the following hyperlink → http://dot0dta1asiis02/plansweb/dpr.asp. You can also access from the MDOT Home page by selecting **E-Plans Archive**.

Vault Plans

The Vault Plans that were once stored in hanging file racks are now available on the Intranet through *Digital InterPlot* electronically. They are viewable, measurable and ready to be plotted to scale through a web browser (i.e. *Internet Explorer).*

Property Plans

This *Archive* will be where Right-of-Way property maps (old hanging files), miscellaneous Survey documents, POR documents and tax maps will be stored and made available through the *E-Plans Archive.*

GETTING STARTED

Accessing the Web Page

The link to our Electronic Plans system on Digital InterPlot is: http://dot0dta1asiis03/plansweb/DPR.asp . We recommend that you save this link as a Favorite in your web browser.

A link to the page can also be found on the MaineDOT Intranet page (MDOTWEB). Figure

Figure 20-1: E-Plans archive via MDOTWEB page

One Time Installation

On the "home page" of our Electronic Plans system, you will see a list of available archives. You can either **Browse** or **Search** these archives. These instructions will cover enough of both to get you started, and to help in reviewing the Sample Images.

On your first time in to Digital InterPlot, when selecting a plan sheet to open by clicking on its thumbnail image, your PC will need to install the Bentley Web Viewing Control. You may get a **Security Warning** asking if you want to install this control. If so, click **Yes .**

Check **Yes, I accept the agreement**

Click **OK**

- The above is a one-time procedure. Afterward, you go directly to the plan sheet that you select.

BROWSING AN ARCHIVE

Simple Browsing and Viewing

The archive that we are using for this example is called **VaultPlans**. This archive contains plan sets that were scanned from our Vault. You can use either the **Folder** icon or the **Browse** tab to get to a page that lists the plot sets within the archive (Figure 20-2). In that list, the items in the **Plot Set Name** column are linked to the corresponding plot sets.

Figure 20-2: Browsing an Archive

Click on a **Plot Set Name** to select a plot set. You are then presented with a list of thumbnail images of the sheets in the set. Click on an image to view the full sheet.

Note the index data for the plot set is listed at the top of a **Table of Contents frame** on the left of your screen (Figure 20-3).

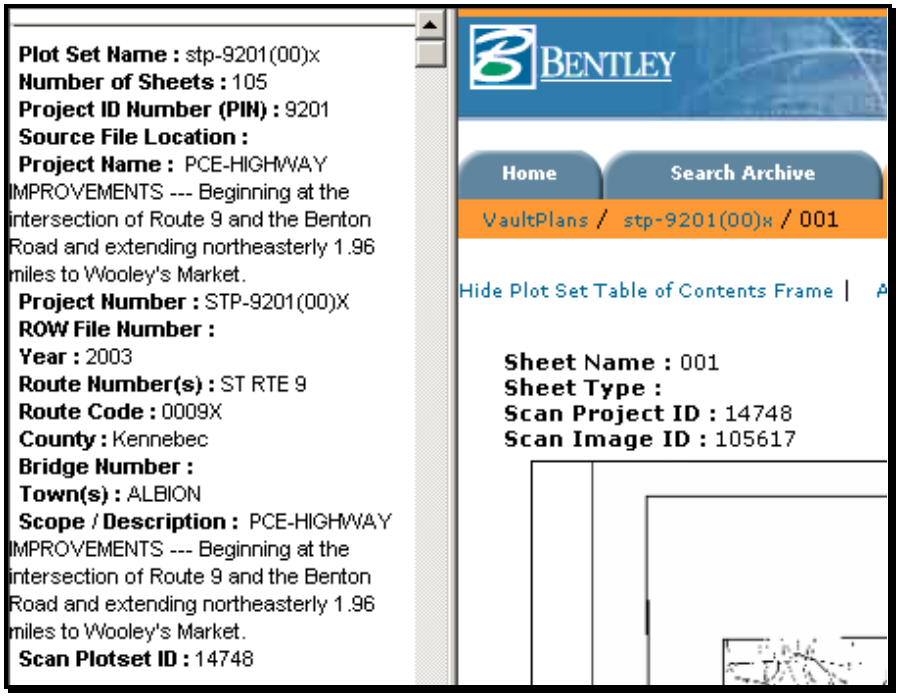


Figure 20-3: Table of Contents Frame

Viewing a Selected Sheet

Notice that there is a link titled "Hide Table of Contents Frame" near the top left of the main frame (Figure 20-3). This will provide more room on your screen to browse the sheet you have selected. There are several controls available in a right-click menu to Pan, Zoom, Window an Area, Fit View, Rotate, Plot, Measure, etc (Figure 20-4).

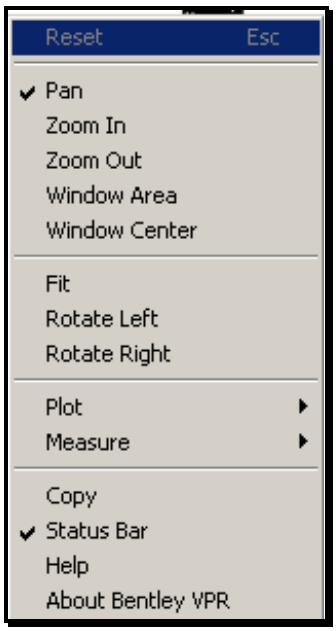


Figure 20-4: Right Click menu items

Icons are also available at the lower left of the view screen (Figure 20-5) to do some of these functions. These icons will be familiar to MicroStation users.

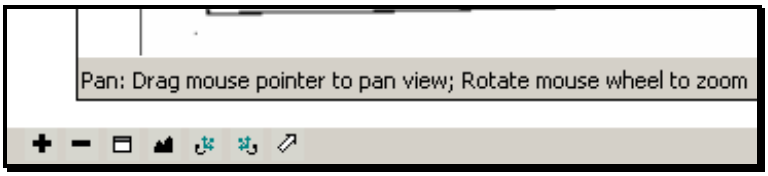


Figure 20-5: View controls

Advanced Searching

Two Stage Search

If you don't know the specific Project Number or PIN that you are looking for, it will be more efficient to do your search in two stages. In the first stage, you will search for title sheets of all the projects that meet your criteria. (A Town would be the most likely.) When you have found the title sheet for the project you are interested in, note the **Scan Project ID**. The second stage will be to search on that number as a **Plotset ID**. This results in all the sheets archived from the selected project.

Example:

Sheet Type: **Title**

Town(s): **Topsham**

Among the results is project *I-95-5(47)74*. The plans for this project have Scan Project ID *1185*. A second search, on Plotset ID *1185*, yields 22 sheets from that project. If we had done a single search for plan sheets in Topsham, we would have had 266 sheets to wade through in order to find what we need.

The advantage of this Two Stage search procedure is that you don't have to browse through a huge number of sheets to find your project!

- Due to the design of the index database, there is a field, shown as **Scan Project ID**, associated with individual sheets, and another field, shown as **Plotset ID**, associated with plot sets. While these are technically different fields, their meaning to us is the same, and they can be used as a key to retrieving the sheets from a particular project, as in the above example.

State Aid Plans

We have scanned some State Aid plans into the VaultPlans archive, which do not have title sheets. Therefore, you can't find them via the Two Stage Search described above. However, we have Region, Division, and SA designations in the ***Source File Location*** field. Use the following example to search for all of the State Aid plans in a particular town

Example:

Source File Location: **SA**

Town(s): **Winthrop**

You can then use the **Sort By** pull down in the Results page to help in focusing in on the plans you need.

Right of Way File Numbers

Right of Way plans are located in the **Property Plans** archive. Most of the plans have a ROW File Number. The file number in Digital InterPlot will consist of a six digit number. The ROW File Number contains a hyphen. You will need to substitute a zero “0” in place of the hyphen. Add a preceding zero to the number to the left of the hyphen if the number is a single digit. Add one or more preceding zeros to the number to the right of the hyphen so that the number is a total of 3 digits.

Example

ROW File Number: 2-58

Digital InterPlot #: 020058

In some cases there will be a letter included at the end of a ROW File number. Tack this letter to the end of the file number.

Example

ROW File Number: 2-129 A

Digital InterPlot #: 020129A

In some cases there will be a letter included at the beginning of a ROW File number. Tack this letter to the front of the file number. Do not use a hyphen.

Example

ROW File Number: S-2-179

Digital InterPlot #: S 020179

Limit Your Criteria Fields

Fill in only the fields that are important in defining your search, using wildcards appropriately (see below). Filling in too many fields may limit your search in ways that you do not intend.

Wildcards

Originally, the % sign was used as the wildcard character in the search criteria, and searches were case sensitive. We have modified the programming to allow the asterisk as a wildcard, and to make the search insensitive to the case of the entered search criteria.

It's generally a good idea to use a wildcard on either side of the text in a criteria field. For example, **Brewer** in the Town(s) field would return plan sheets in any plot set where "Brewer" is included in the field, including entries like "Bangor, Brewer". Specifying a town name without the wildcards will cause the search to miss records where the specified town is one of several in a list.

Practice

As you experiment with searching the archive, you will get a better feel for what works and what doesn't. Maybe you'll even come up with some suggestions we can use in this Hints and Tips list!

MEASURING A E-PLAN IMAGE

Overview

Digital InterPlot assumes a 300 dpi image when it calculates scales. Our Black and White images are 300 dpi. However, our color images are 200 dpi. Therefore, when setting scales for plotting or for measuring (color images only), there is a "fudge factor" involved. We, and some of the other customers, are urging Bentley to modify their software to automatically adjust the calculation, depending on the image resolution, without the need for a fudge factor. Until that is done, there is a ratio of 300/200 (or 150%) that needs to be applied to the scale setups for color images.

If you see shades of gray in the image, especially in the background, it is most likely a color image. The black & white images have no gray in them and have a crisp white background.

Configure Ruler

Before measuring either distances or areas, you need to complete the settings under **Configure Ruler** in the **Measure** menu. You first enter this menu system by a **Right-Click** on the image, then choose **Configure Ruler** (Figure 20-6).

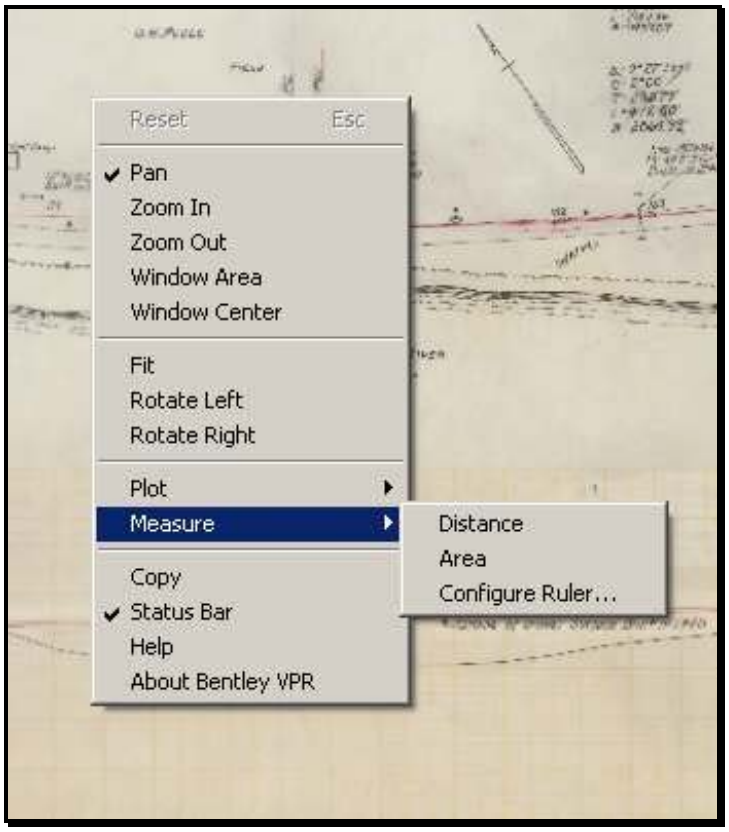


Figure 20-6: Entering the Ruler Configuration

Example 25 ft per 1 Inch

The image below (Figure 20-7) illustrates the setup for a scale of 25 feet per inch. Note that we have indicated that we will measure in **Model Units**, and that **1.00 inches** on the paper equals **25.00 feet** in the model (or on the ground in our case). For a color image, the settings would be 1.00 inches on the paper equals 37.5 feet in the model, due to the "fudge factor" discussed above.

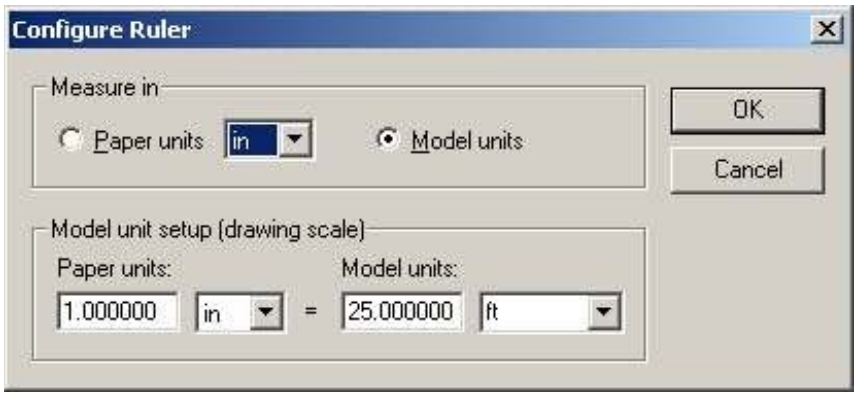


Figure 20-7: Setup for 25 feet per Inch

- We recommend that you do a test measurement on a known distance, such as a station interval, to confirm that your ruler setup is correct before you do a series of measurements.

Other Setups

You need to know the scale of the drawing you are measuring, in order to set the Ruler correctly. It is possible to set up for any scale ratio. You must remember to add the 150% "fudge factor" when measuring on our color images. Here are some typical setups for plan view drawings (Figure 20-8).

	Paper Units	Model Units
B&W 25 Scale	1.00 in	25.00 ft
Color 25 Scale	1.00 in	37.50 ft
B&W 50 Scale	1.00 in	50.00 ft
Color 50 Scale	1.00 in	75.00 ft
B&W Metric 250 Scale	1.00 mm	0.25 m
Color Metric 250 Scale	1.00 mm	0.375 m

Figure 20-8: Typical drawing scale setups

Measuring Distance

Choose **Measure - Distance** from the **Right-Click** menu. Click on the first point, then click on the second. You should see the measured distance in the lower-right border of the drawing window (Figure 20-9). You can continue measuring a cumulative distance, from

point to point to point. One tap on the **ESC** (Reset) key will reset the measurement to zero.

Two taps on the **ESC** key will back you out of the Measure Distance command.

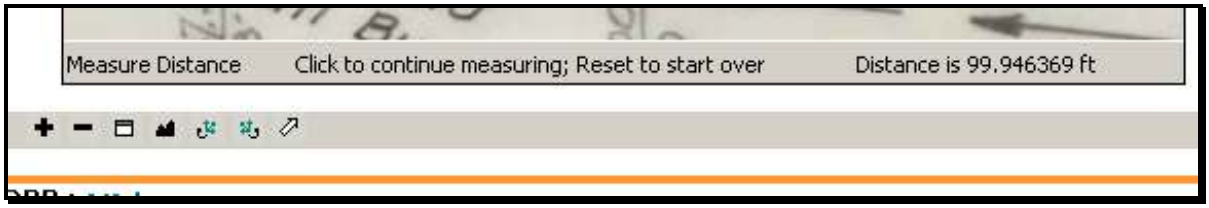


Figure 20-9: Distance is displayed in the lower right hand corner

Measuring Area

Choose **Measure** - **Area** from the **Right-Click** menu. Click on the first point, then click on the second, and continue to define a polygon to be measured. You should see the measured area in the lower-right border of the drawing window (Figure 20-10). One tap on the **ESC** (Reset) key will reset the measurement to zero and clear the polygon.

Two taps on the **ESC** key will back you out of the Measure Area command.

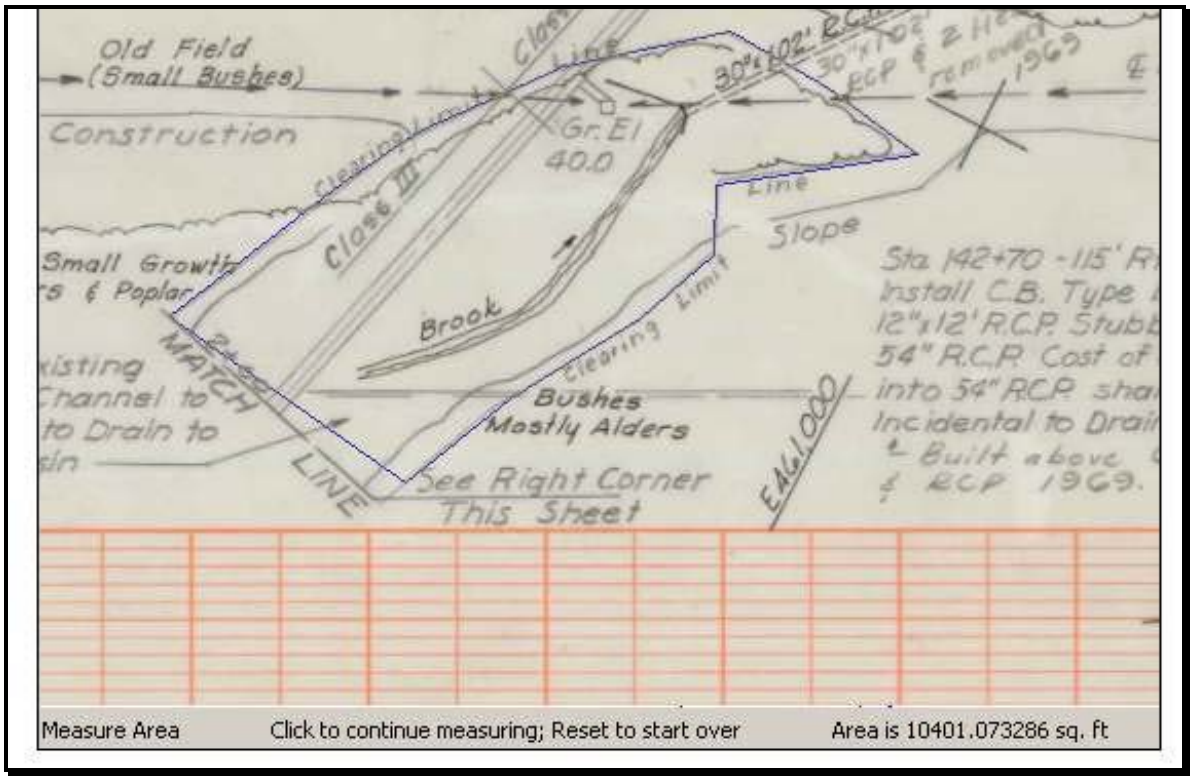


Figure 20-10: Area measurement displayed in lower right hand corner

PLOTTING (PRINTING) A SELECTED SHEET

Overview

There are several variations available in methods for printing and plotting. We'll discuss a method here that should be appropriate for most situations.

Plot to Form

From the right-click menu, select **Plot to Form** (Figure 20-11). You can choose any printer or plotter that is set up in Windows on your PC.

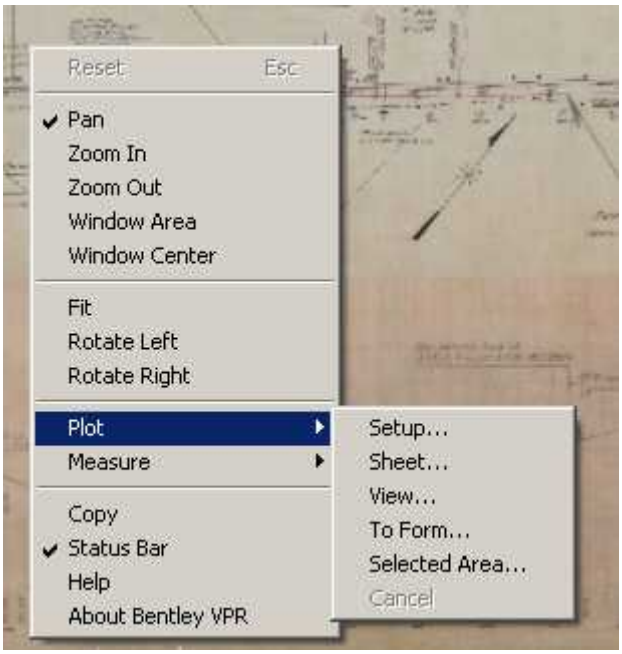


Figure 20-11: Right Click, select Plot to Form

> ✓ *Refer to page 1-32 for a list of available plotters and how to add them as a Windows Printer.*

Once you choose a printer or plotter, you should click on the **Properties** button to select the appropriate sheet size (normally *D+* or *Arch D*) and orientation (normally Landscape).

> ♫ To plot only a portion of the sheet, select a different page size such as 8 ½ x 11. The shape on your cursor will be adjusted to this size.

After you click OK on Properties, you need to set up the scaling of the plot.

Black and White Images

Digital InterPlot scales correctly with our black & white images, which were scanned at 300 dpi. If you are printing from a black & white image, select **Plot at Original Scale.** To get a half size plot, use 50.0 in the Scale Percentage field.

Color Images

However, we have to set a scaling factor to get the proper sizes in our color 200 dpi images. To get a plot from a color image at full scale, use 150.0 in the Scale Percentage field. To get a half size plot, use 75.0 in the Scale Percentage field.

Place the shape

Place the sheet frame on the image with a left-click of the mouse. The original may have been wider than the sheet frame. This procedure lets you decide which margins to crop off to make the plot fit well.

Confirm by responding **Yes** to the *Plot Selected Area* question (Figure 20-12).

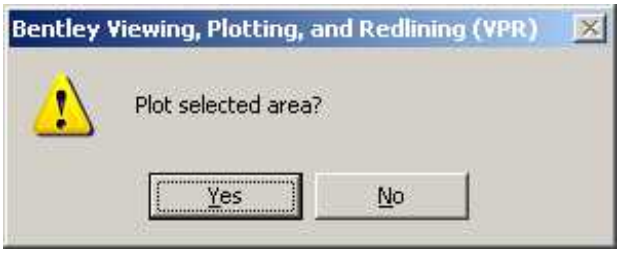


Figure 20-12: Plot selected area?

- You can answer No at this time if you have changed your mind.

USING A DOCUMENT POOL

Overview

A Document Pool is a collection of digital plots (DPR files). The following is a summary of the use of the Document Pool for printing:

Add Single files to the Document Pool

From the "Plot Set Table of Contents" page or the "Archive Results" page, click the check box next to the thumbnail. Check as many sheets as you want on this page (Figure 20-13).

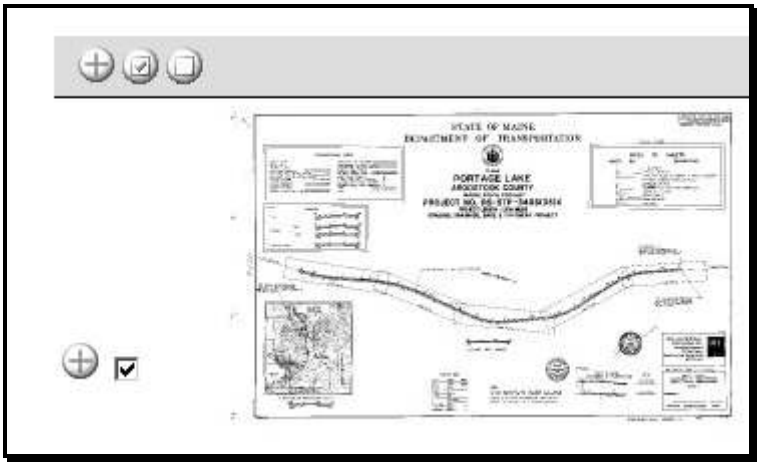


Figure 20-13: Place a check in the box next to the image

Click the "Add to Document Pool" icon (+) next to the check box (Figure 20-14) to add the document(s) to the document pool.

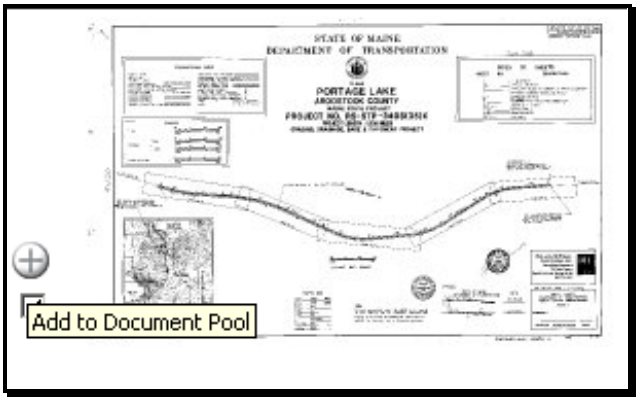


Figure 20-14: Click the Plus sign (+) next to the check box of the image

- You can repeat these first two steps to add sheets from other pages to the Document Pool.

Add Multiple files to the Document Pool

Part One: Display all Documents on one Page

If you have isolated the search to display only the pages you wish to print, you can add them all at once to the *Document Pool.*

Only five images are displayed in the thumb nail view by default when the results of a search are displayed in *Digital InterPlot.* Towards the top left of the window (Figure 20-15) you will notice the *Number of Records Found* for the search (i.e. 65). The *Records per page* is only displaying 5 at a time.

Figure 20-15: Number of Records Found and the Records per Page

Part Two: Change the Records Per Page

Change the *Records per page* to the *Numbers of Records Found.* Type in 65 in the *Records per page* box and hit *Enter.* The page should now display all 65 images (Figure 20-16).

Figure 20-16: Records per page matching the Number of Records

Part Three: Select all Documents

Select all the images at once by clicking the *check* mark in gray bar above all the images (Figure 20-17). This will place a *check mark* next to all the images on the page.

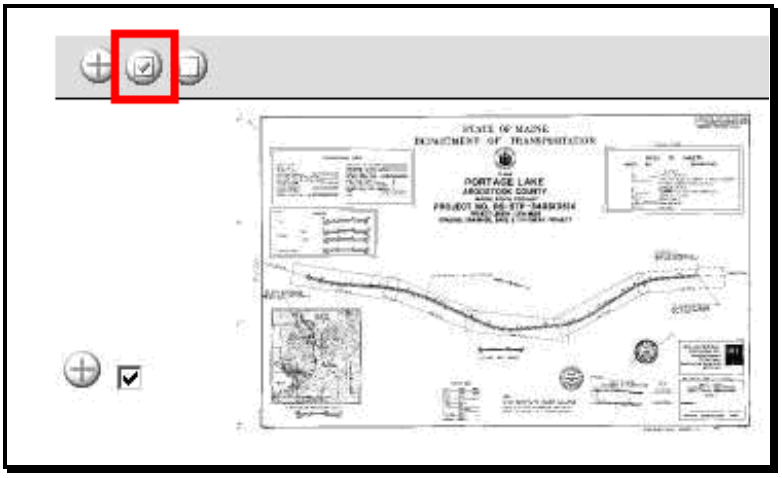


Figure 20-17: Select all the images at once

Part Four: Add to the Document Pool

Click the *Plus Sign* (Figure 20-18) next to the *Check Mark* to add all the images to the *Document Pool.*

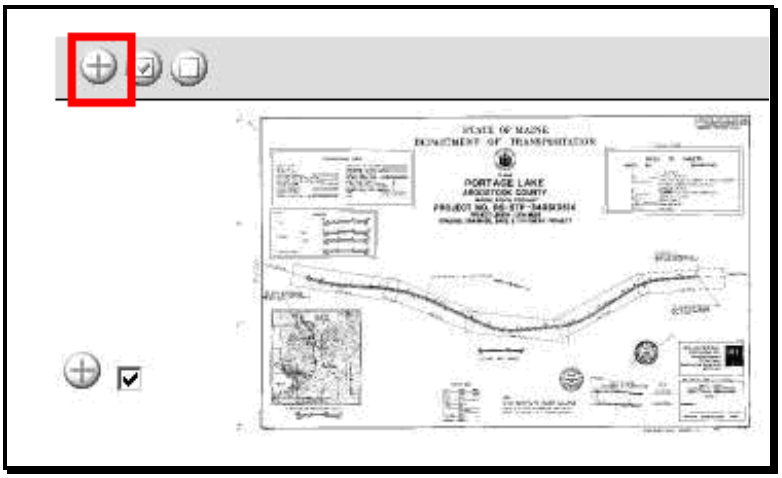


Figure 20-18: Click the Add button to add all images to the Document Pool

- The last icon next to the *Check Mark* will *Clear all* of the documents (removes the *check mark* next to all the images).

Removing Documents from the Pool

From the Digital InterPlot page, click the "Document Pool" tab. Click the check box next to the thumbnail to select the document (Figure 20-19).

Click the "Remove from Document Pool" icon (-) next to the document name.

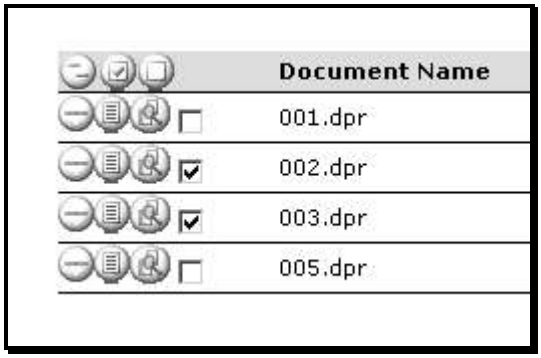


Figure 20-19: Images in the Document Pool

Printing Documents in the Document Pool

If you are satisfied with the documents in the pool, select the *Check Mark* above all the images to select them all (Figure 20-20).

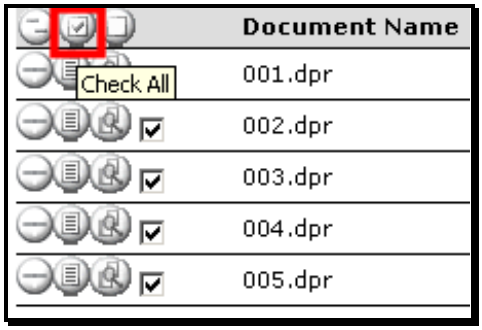


Figure 20-20: Check All button

Pick *Print Pool* towards the top right of the page. This opens the *Digital InterPlot Document Pool Printing* window (Figure 20-21). By right clicking, you have an option of sorting, deleting or moving a document to get them in the correct order.

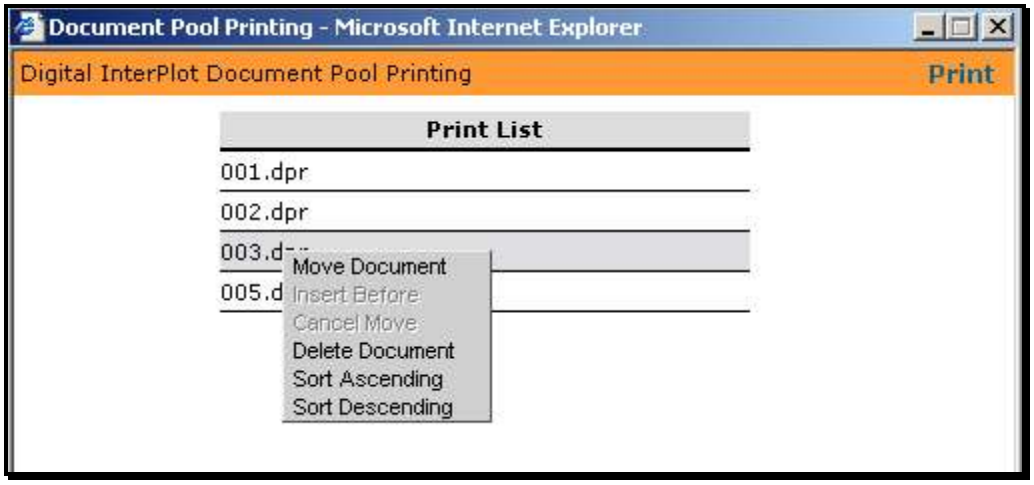


Figure 20-21: Right Click to sort or move a document

To print all the documents in the Print Pool, click Print.

The print dialog box then comes up, where you can make settings, as you do for other methods of printing.

✓ *Refer to page 20-14 for picking a plotter and adjusting the settings.*

SAVING AN IMAGE TO DISK

Saving a JPG Copy of Image

At the very bottom of the view page, there is a link to a JPEG image file of the selected plan sheet. As with many web sites, you can **right-click** and do a **Save As** to get your own copy of the image to use however you need.

DISPLAY FIX

Overview

On some PC's, especially some of Maine DOT's laptops, you may see a display problem when viewing a sheet through DI, InterPlot Organizer, or the Portable Plan Set viewer. The image will appear as if it has been "shredded" (Figure 20-22). The fix for that problem is to set the following two variables in Windows at the System level: QV_SWCONTEXT=1 and QV_NOPBUFFER=1.

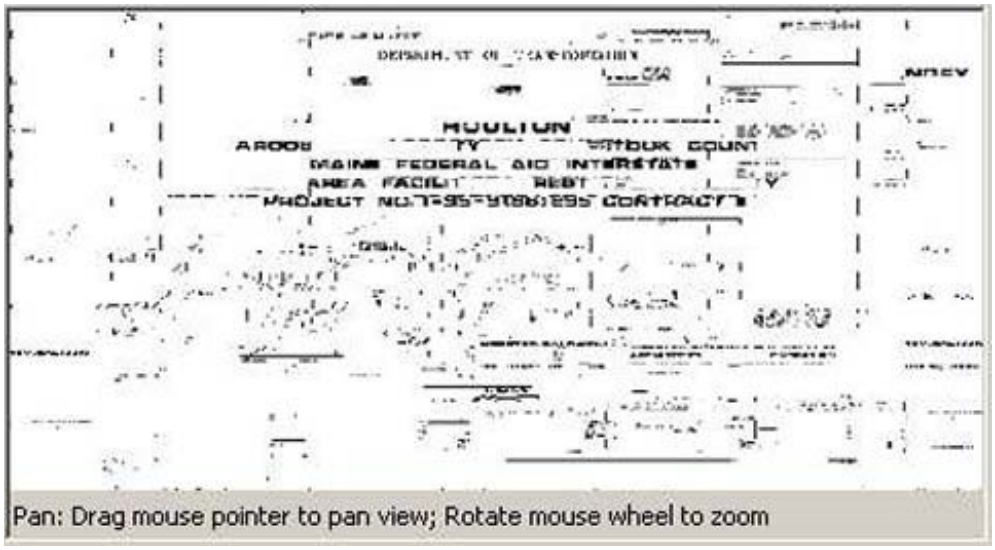


Figure 20-22: Image on a PC that requires the Windows System Variable

Add Windows System Variable

Step One: Right Click My Computer

Right click the *My Computer* icon and select *Properties.*

Step Two: Select Advanced Tab

Select the *Advanced* tab and click on *Environmental Variables* (Figure 20-23).

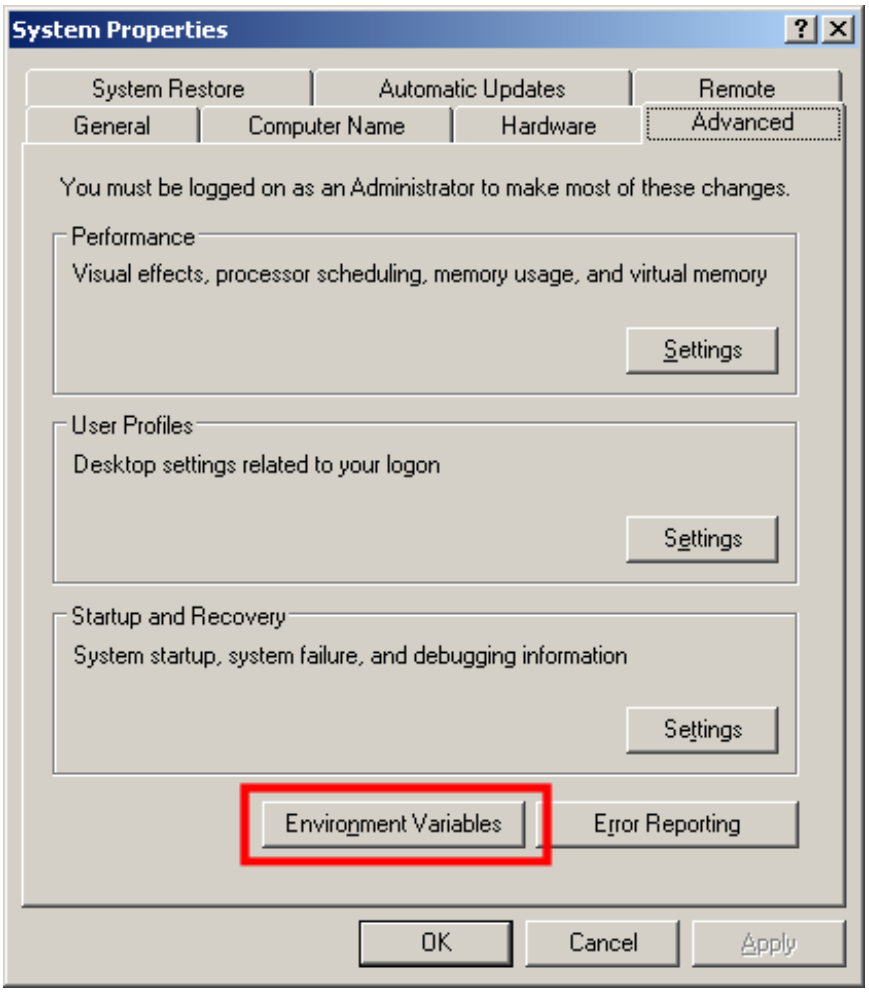


Figure 20-23: select the Environmental Variables button

Step Three: Add new System Variables

Select the **New** button in the **System Variables** section. Add the two new variables (QV_SWCONTEXT=1 and QV_NOPBUFFER=1) and their values as shown in Figure 20-24.

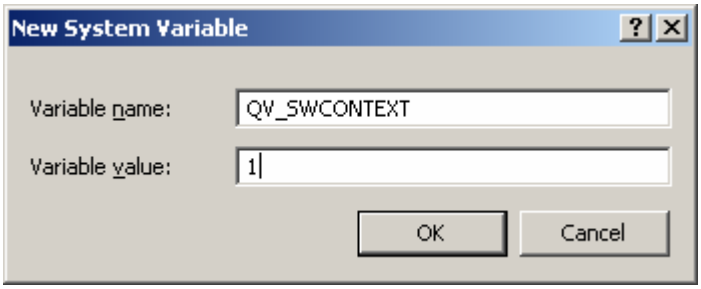


Figure 20-24: Add the variables and their values

Once the variables have been added, you should be able to locate them in the list of System Variables (Figure 20-25).

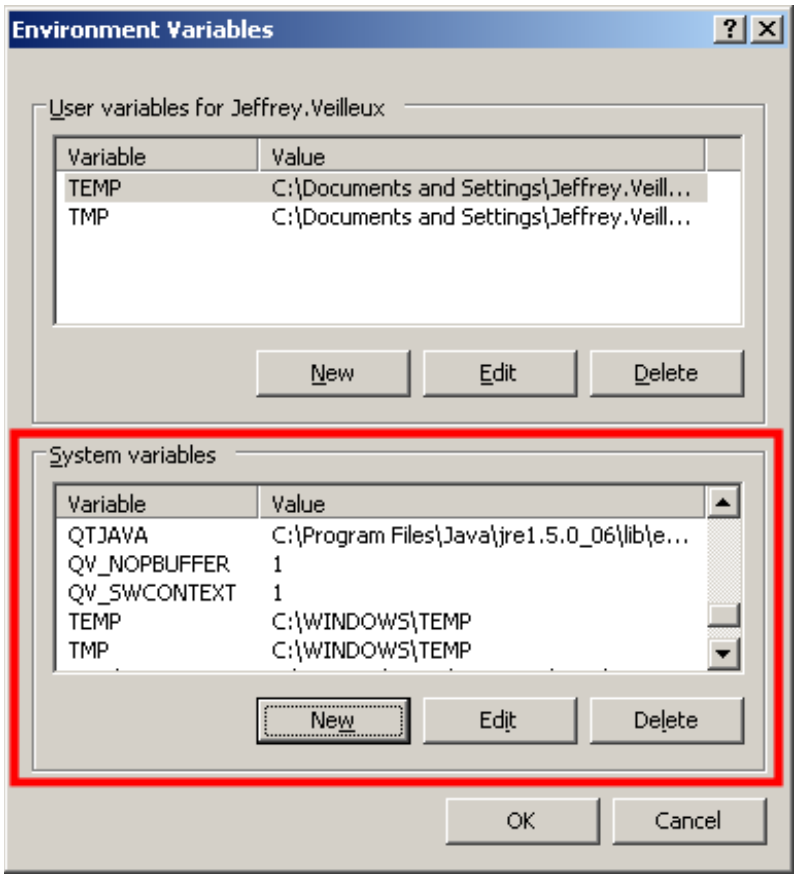


Figure 20-25: New variables added to the System Variables

DATA FIELD DICTIONARY

Fields in Vault Plans Search Page

Plot Set Name

This field comes from the file name of the IPS file used to create the plot set. For our scanned Vault Plans, this filed is derived from the Project Number. In the Browse Page, this is the field with the attached link to go to the plan sheets in the set.

Sheet Name

This field comes from the file name assigned to the image when Smooth Solutions did the scanning. It is normally the sheet number, padded to at least 3 places. For example, sheet 2 of the plan set becomes 002. When there are sheets added in between, or the scanners found two or more of the same sheet number, Sheet Names like "002A" are created.

Sheet Type

This is the type of sheet, as interpreted by the scanners, from the following list:

Title, Typical Sections, Standard Details, Estimate, Drainage, Plan, Profile, Plan_Profile, Xsections, Geometry, Highway_Other, RWPlan, Bridge_Abutment, Bridge_Pier, Bridge_Superstructure, Bridge_Details, Bridge_Other, Other

Project ID Number (PIN)

This field is the PIN that we use on newer projects. Projects started before 1982 did not have PINs assigned.

Source File Location

In the case of the Vault Plans, this field is used for the "Rack ID" where the plans were stored. It can be useful in comparing with the earlier Vault Plans Index.
In the case of Right of Way Plans, this field is used to indicate where the scanned plan was stored. This field, along with the ROW File Number can be used in comparing with the old RW Plans Index.

Project Name

This field was intended for the name and/or description on the title sheet of the plans. However, the process of transferring data from the old Vault Plans Index has resulted in the contents of this field usually being the same as the Scope/Description field (which is normally the same information).

Project Number

This is the Project Number as shown on the Title Sheet. This is likely to be a Federal-Aid Project Number with various initials or abbreviations in it. The format of these numbers varies widely. The early projects had very cryptic numbers.

ROW File Number

This field contains a number assigned by our Right of Way staff to track the RW Plans. It will be blank in plot sets that are not RW Plans.

Year

Ideally, this is the year that the project was constructed. However, the old index was incomplete and lacked this information on many projects. In these cases, we have instructed Smooth Solutions to use the latest year they can find on the plans. If they have searched and cannot find a date, they are to enter “NONE” to indicate that the search was made and no date was found.

Route Number(s)
This field contains the route number, from a standard list, for most highway projects. Unfortunately, most of our bridge projects do not list a route number on the plans, relying only on the bridge number. There can be multiple route numbers listed on a project.

Route Code
This field contains an MDOT route code, which has been used by Planning and others, and relates directly to the route number. This field will provide more precise search results if you know the code for the route you are looking for.
On projects which did not have a Route Number listed in the old index, we do not have a Route Code entered.

County
This field can have more than one county in it, when projects cross county lines.

Bridge Number
This field can have more than one bridge number in it, when multiple bridges are involved in the project.

Town(s)
This field can have more than one town in it, when projects cross town lines.

Scope / Description
The contents of this field were taken from the old indexes. Many of these entries include four letter “scope codes.” We have a list of the scope codes, which will be published with our online documentation for the Plans Archive.

Scan Plotset ID
This field is essentially a “serial number” for the Plot Set (project) as it is processed into the Digital InterPlot system. Each plot set will have only one Scan Plotset ID. This field can be useful in doing a two-step search, where you get a list of title sheets meeting your search criteria, identify the project you want, then search for all sheets belonging to that plot set.

Sheet Fields
Sheet
This field is a number generated by Digital InterPlot. A “3” in this field means that this is the 3rd sheet entered. When additional sheets are inserted, such as sheet 3A, or when sheets are missing from the set, this number does not match the sheet number on the plans.

Sheet Name
This field comes from the file name assigned to the image when Smooth Solutions did the

scanning. It is normally the sheet number, padded to at least 3 places. For example, sheet 2 of the plan set becomes 002. When there are sheets added in between, or the scanners found two or more of the same sheet number, Sheet Names like “002A” are created.

Scan Project ID

This field is the “serial number” for the Plot Set, and is the same number as the Scan Plotset ID. (Due to the structure of the database, this sheet field has a different name than the corresponding field in the plot set. There is a “hidden” field which serves as the index on which the relationship between plot sets and sheets is technically established.)

Scan Image ID

This field is a “serial number” for the image. Each image has a unique Scan Image ID, which can be used for system management purposes. This is required because the image file names are not unique.

Other Fields

Number of Sheets

This is the number of sheets in a Plot Set in Digital InterPlot. It is very likely not the same as the number of sheets in the original plan set. For most projects, the cross section sheets were pulled out and microfilmed years ago. Other sheets may be missing, for whatever reason.

Sheet __ of __

This is based on the sheet numbering generated by Digital InterPlot, and likely does not coincide with the original numbering of the plan set.

DPR

For a sheet, this is a link to an image file in the DPR format that Digital InterPlot uses. For a plot set, this field is a link to the IPS file that defines the makeup of the plot set.

JPEG

For a sheet, this is a link to an image file in the JPG format, which is a popular industry standard. You can Right-Click and Save As to get your own local copy of the image file, to be used with MicroStation, or almost any software that handles images. For a plot set, this field is a link to the IPS file that defines the makeup of the plot set.

PORTABLE PLAN SET

To be documented in the future.

INDEXING AN ARCHIVE

To be documented in the future.

PLOTTING TO AN ARCHIVE

To be documented in the future.