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### **D7.01 General**

This chapter defines the standards required for preparing electronic Computer Aided Drafting (CAD) data at major milestones including final delivery. These standards are intended to complement the WSDOT *Plans Preparation Manual (PPM)*, but relate to the electronic files specifically. The PPM will supersede in the case of any conflicts with this manual.

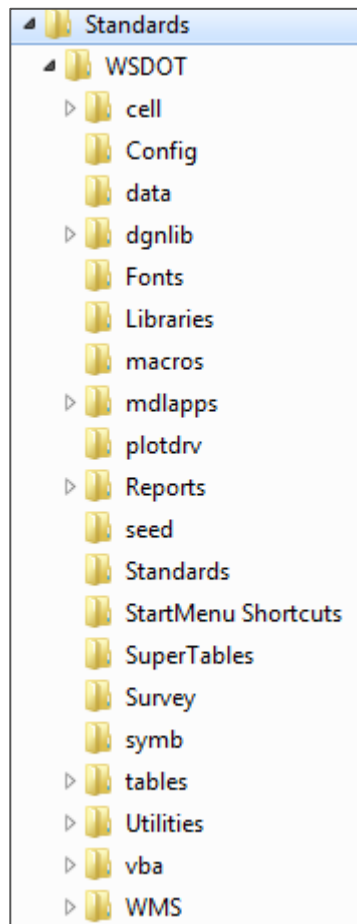
The designer is responsible for resolving all omissions, deficiencies, and errors in a timely manner to prevent any negative impacts on the project schedule.

### **D7.02 WSDOT Resources and Related Conventions**

CAD operators will use the most current set of WSDOT resources for MicroStation, including levels, seed files, cell libraries, linestyle resource files, plot configuration files and pen tables.

The WSDOT CAE resource environment provides files and electronic resources organized under a master resource folder. The master resource folder contains all of the electronic resources necessary for WSDOT Plans, Specifications, and Estimates (PS&E) and Right of Way contract plan set development (see Exhibit 7-1).

Exhibit 7-1 WSDOT Resource Folders



### D7.02(1) Cells

Cells represent point symbology for all disciplines in MicroStation. From single feature symbology in base plans to legends, schedules, and details in sheets, they are compiled into libraries in the \Cell folder with file extensions of \*.cel.

... \cell\WAESTATE.CEL contains WSDOT standard element cells and symbology. Base plan cells, designed specifically for base plans, have master units of feet and are placed according to their type – either symbol or true-sized cells. All cells will place correctly in both USFt and Inch WSDOT files using the Place WSDOT Item utility. However, placing cells outside of this utility must consider scaling appropriately to WSDOT standards.

... \cell\WAEDetails.CEL contain WSDOT standard cells and symbology for sheet files, as well as a starting point for additional template project-specific and general details.

Cells that are designed for placement in the sheet file are named with the **SH** parent code and have master units in inches. These cells are placed directly in the sheet file at a scale of 1:1 for multiple sheet-per-file approach (see D7.03(2)(a)) and the drawing scale for single sheet-per-file approach (see D7.03(2)(b)).

**Base file symbol cells** appear on plan sheets and are always the same size on the paper regardless of the plan sheet scale. On the printed plan, symbol cells do not reflect the actual size of the object they represent, just the locations. Examples of symbol cells are

catch basin and utility pole symbols. WSDOT symbol cells apply the drawing scale that size them appropriately on the printed sheet. When placing these cells in the base plan, they must be scaled up by the same scale factor as the sheet. Consequently, when placing cells for a base plan that will be plotted at 1"=100', the cell should be placed at an active scale of 100. This scale is set automatically when the Place WSDOT Items menu and scale tools are used.

**Base file true-size cells** are cells that are always the actual ground size of the objects they represent. Examples of true-size (also referred to as non-scalable) cells include many of the painted pavement markings such as the HOV symbol and RR crossing symbol. True-size cells are sized in the library so that they should always be placed at an active scale of 100 in the base to reflect the true ground size regardless of plotting scale. True-size cells are flagged in the **Symbology 4** and **5** sections of this manual and on the Place WSDOT Items menu to indicate this behavior.

The correct cell size is calculated automatically when using the Place WSDOT Items menu based on the scale selected, the type of file (sheet or base) and the type of cell being placed. When not using WSDOT utilities to place symbology, the active scale should be set appropriately.

Sheet cells can be manually placed in the base files by selecting the desired plotting scale and making sure that the True Scale option is turned off. Base cells can be manually placed in a sheet file by selecting a scale of 1 and making sure that the True Scale option is turned off.

### **D7.02(2) DGNLib CAD Libraries**

DGN Libraries contain the WSDOT standard leveling scheme as well as custom menu options used in WSDOT workflows. They also contain other functional customizations such as filters and print styles. These files are stored in the ...\**dgnlib** folder and should not be modified in any way.

A secondary project level DGN library is stored in the project directory structure in the **CAD\Rsc\DGNLIB** subfolder. The **ProjectID.dgnlib** contains project specific levels that are above and beyond the standard scheme and any user-defined filters, or tools for the project.

**NOTE:** In order for this file to be available in MicroStation, the **CAD\Rsc\dgnlib** folder must be added to the MicroStation environment variable MS\_DGNLIST. MS-DGNLIST is modified automatically when the *Create WSDOT Project* utility is used and the MicroStation project is selected through the MicroStation File Open dialog box.

### **D7.02(3) Fonts and Text**

All WSDOT standard fonts are stored in the ...\**Fonts\font.rsc** file. In most cases, PS&E plans use font 164 (Arial Italic) to call out existing features and font 217 (Arial Bold) for new features. Right of Way also typically incorporates font 200 (Arial). Exceptions and more specific details can be found in the **Symbology 4** and **Symbology 5** sections of this manual.

For PS&E and Plans for Approval (PFA) plan sheets, minimum text size is 0.07" on the 11" x 17" printed sheets.

For Right of Way (R/W) plan sheets, minimum text size for existing text is 0.10" and 0.12" for new text on 22" x 34" printed sheets.

Text at minimum sizes shall be all upper case. Text at larger sizes may be in upper and lower case.

Specific font and text size requirements for each data item can be found in the **Symbology 4** and **Symbology 5** sections of this manual.

When working in a base plan, the relationship between printed text size in the **Symbology 4** and **5** sections of this manual and the text size setting in MicroStation is:

$$\text{MicroStation setting} = \text{final print size} \times \text{plotting scale.}$$

To place text in a base file that is to be .07 inches on paper with a plotted scale of 1"=50', multiply .07 inches times 50 feet per inch to get 3.5 feet. Similarly, the text size setting in a base file to produce text at 0.1 inches on a 1"=100' scale drawing is 0.1 inches times 100 feet per inch or 10 feet.

When working in a sheet file, the text size should always be set to the true size desired on the final drawing as specified in the **Symbology 4** and **5** sections of this manual. Text size is calculated automatically when using the Place WSDOT Items menu based on the scale selected and the type of file you are working in (base plan or sheet).

## D7.02(4) Plotting Resources

### Configuration Files

When plotting WSDOT plan sets, the standard deliverable plot configuration files for MicroStation are in the ...**\plotdrv** folder.

These plot configuration files must be used to ensure the linestyles and weights plot according to WSDOT standards. The major plot configuration files and their uses are shown in the following table.

Plot Configuration File	Output
EngBWFull.pltcfg	Black and white, 34 x 22 plots
EngBWHalf.pltcfg	Black and white, 11 x 17 plots
EngCFull.pltcfg	Color, 34 x 22 plots
EngCHalf.pltcfg	Color, 11 x 17 plots
PDF_EngBWFull.pltcfg	PDF format, black and white, 34 x 22 plots
PDF_EngBWHalf.pltcfg	PDF format, black and white, 11 x 17 plots
PDF_EngCFull.pltcfg	PDF format, color, 34 x 22 plots
PDF_EngCHalf.pltcfg	PDF format, color, 11 x 17 plots

## Pen Table

Pen tables contain instructions for re-symbolizing the printed output of DGN files. At WSDOT, this typically takes the form of printing sequence.

When plotting WSDOT plan sets, the ...`\plotdrv\wsdot.tbl` pen table should be used. This pen table prints shapes first, then other vector elements so that the shape appears behind the other graphics regardless of the priorities assigned by MicroStation. **WSDOT\_OrderByMS.tbl** prints the elements honoring the priority assigned in MicroStation.

## Print Styles

A limited set of Print Styles are available for use with MicroStation's Print Organizer. These are for various sizes of PDF prints from both base and sheet files. They are automatically configured to be available using the WSDOT environment. These styles are stored in a DGNLib file within the WSDOT resource file set.

### D7.02(5) Seed Files

WSDOT seed files shall be used when creating files for PS&E, PFA, and R/W plan sets. These files include tags and other properties that indicate their function and purpose.

The ...`\seed\PSE_BASE.dgn` file is the seed file to be used when creating PS&E and PFA base plan DGN files.

The ...`\seed\PSE_SHEET.dgn` file is the file to be used when creating PS&E and PFA Sheet DGN files.

The ...`\seed\RW_USFoot.dgn` file is the seed file to be used when creating R/W base plan or R/W sheet DGN files.

Sheet files are designated via a property in the seed that indicates their master units to custom utilities for placing and printing WSDOT sheet borders. R/W files are also designated via this same property and are handled differently when placing scaled symbology due to the full size deliverable requirements.

Details on the WSDOT seed files are as follows:

#### **PSE\_Base and RW\_USFoot seeds:**

- Master Units: US Survey Feet – FT
- Sub Units Custom – th (1000 th per FT)
- Resolution: 1,000,000,000 (1B) per US Survey Foot
- 2D workspace

#### **PSE\_Sheet seeds:**

- Master Units: Inches – in
- Sub Units Custom – th (1000 th per in)
- Resolution: 1,000,000,000 (1B) per Inch

- 2D workspace

### **D7.02(6) symb Line Styles**

All WSDOT custom linear symbology or *Line styles* are available through the ...\*symb*\LSTyles.rsc file. These linestyles are stored in the RSC file at the true size they will appear on the printed sheet.

When placing custom line styles in a base plan, they must be scaled up by the same scale factor as the sheet. Thus when placing a line style that will be plotted out at 1"=100', the line style should be placed at an active line-style scale of 100.

If a custom line style needs to be placed in the sheet file (e.g., in a legend), it should be placed at an active line-style scale of 1.

Custom line style scales are calculated automatically when using the Place WSDOT Items menu based on the scale selected and the type of file (sheet or base).

Changing line style scales after placement to meet WSDOT standards may be done using native tools.

### **D7.02(7) symb Color Table**

By default, the color table located in the ...\*symb*\color.tbl file should be attached to WSDOT DGN files. The **color.tbl** is configured to color all elements according to their parent category so that each major group has its own color.

Optionally, **Color2.tbl** may be useful when working on a specific major category of features as it breaks up the set of elements having the same parent code into subgroups that show up with different colors.

For example, with **color.tbl** attached all new utilities display in the same color. With **Color2.tbl** attached, new utilities display with the various utility types (water, gas, telephone, etc.) in different colors.

## **D7.03 File Types and Requirements**

Deliverable data for a MicroStation electronic plan set is stored in either a base or a sheet file. This section will define these two file types and their requirements.

### **D7.03(1) Base Files**

The **\_BaseFiles** folder stores all vector files that are referenced to contract plan sheet files. These could be a number of types of files that are set to real world units, not paper units. The data is located in the file coordinately correct per the project datum documented in the **\_DatumAndControl** project folder.

*Base Plans* are 2D DGN files that contain coordinate (XY) based information for the plan set. This includes all survey data, Photogrammetry data, locations for all new data and all metadata text related to those elements and features. This file type is typically maintained by a drafter for the sole purpose of supporting plans preparation.

*Base Maps* are 3D DGN files that contain coordinate (XYZ) based information for the plan set. This typically includes survey data, Photogrammetry data, surface data, and

volume graphics. This file type is usually maintained by a designer or surveyor and not typically referenced directly to a sheet file.

Depending on the project footprint, activity, and other factors of any specific project, there may be one or more base plans. For small, simple projects it may make more sense to keep all coordinate-based data in one base plan. With more complicated projects it is commonly more efficient to split the coordinate-based information into multiple base plans. Typically these multiple base plans would contain data for specific activities that translate to plan types (e.g., drainage, channelization, and site preparation) or sources of data (e.g. existing condition, alignments). A multiple base plan organization allows more than one drafter to access and work on base plan data simultaneously. Either configuration is acceptable. However, experience may prove that setting up multiple base plans in the beginning is easier to adjust to project scope creep rather than attempting to manage more than is practical in a single file.

### File Naming for Base plans

Base plans will all have a file type code of BP. (See **Deliverables 4** for complete details).

Examples:

<b>XL1234_BP_EX.DGN</b>	Base plan containing all existing data
<b>XL1234_BP_DR.DGN</b>	Plan containing all new drainage data
<b>XL1234_BP_ALRW.DGN</b>	Plan containing all new alignment and R/W data
<b>XL1234_BP_PFA.DGN</b>	Base plan containing Plans for Approval (PFA) intersection/interchange data

### Saved Views in Base Plan Files

If saved views are to be used in base plan files, each sheet border will have a saved view assigned to include the full border location and limits with the view rotated so that the border is square with the view window

#### Generic Location Saved Views

This method requires that a saved view be generated for each sheet location. All saved views in the base plan must be rotated so that the controlling alignment is horizontal across the saved view as it would be in the sheet (top and bottom borders at absolute East-West orientation). This rotation of the saved view is what controls the orientation of the reference file in the attachment to the sheet file. In this method, level display will be maintained through the sheet file references.

### Project Filters in Base Plan Files

The WSDOT environment contains a set of filters for standard plan types stored in the **WSDOT.dgnlib** file. These filters can then be used to adjust levels in sheet and base plans. Custom filters will be stored in the WSDOT resources.

If used in the base plan, custom filters will be documented in the *Base Plan Doc* tab of the **ID1234\_CADProjectDoc.xlsx**.

### **Project Datum**

The datum used in the base files shall match the datum and units used throughout the project. Typically this is a project datum in US Survey feet.

### **D7.03(2) Sheet Files**

Sheet files contain sheet borders with associated title block information and all elements that are placed in relation to the sheet border such as notes, legends, scale bars, match lines and north arrows.

#### **Sheet Border Dimensions (in paper units)**

Each PS&E sheet border measures 10" x 15.75" and is positioned in a plot limit shape to provide the standard margins on 11" x 17" paper.

Each PFA sheet border measures 20" x 31.5" and is positioned in a plot limit shape to provide the standard margins on 22" x 34" paper.

Army Corps of Engineers sheet borders are in portrait mode and measures 8" x 9.8" sheets centered on 8.5" x 11".

Each Right of Way sheet border measures 21" x 33". Standard margins are 0.5" on all sides on 22" x 34" paper.

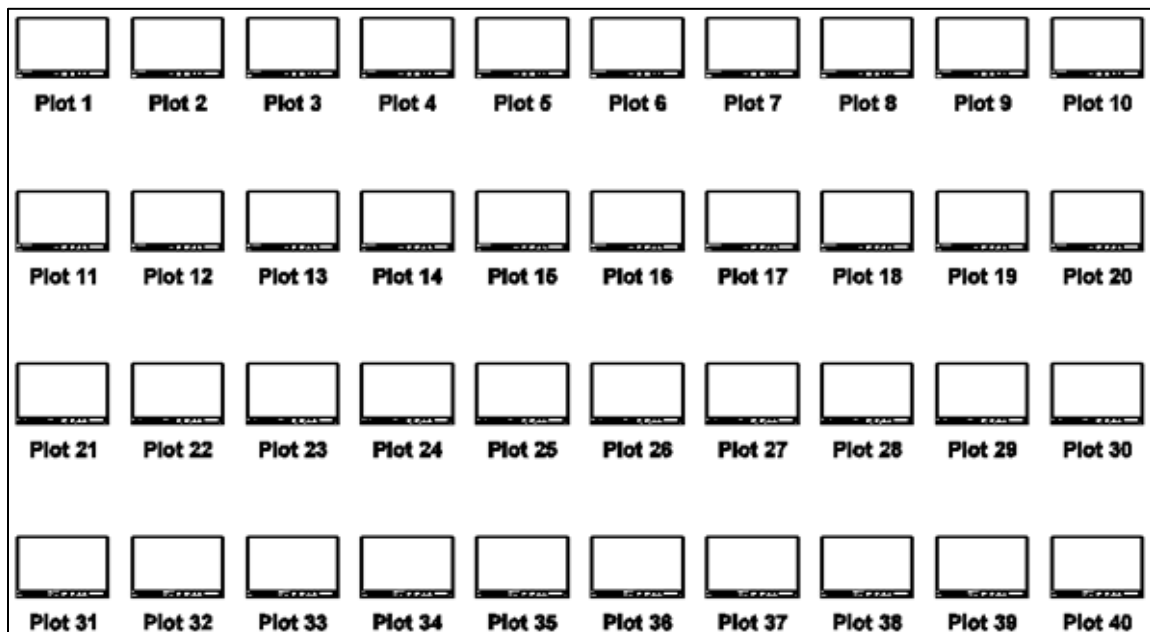
Each Record of Survey sheet border measures 17" x 21.5". Standard margins are 2" Left, 0.5" all other sides on 18" x 24" paper.

#### **(a) Multi-Sheet Matrix Method**

Using the Place WSDOT Items menu, sheet border cells are placed in the sheet file at an active scale of 1 in a matrix shown below.



Exhibit 7-3 WSDOT PS&amp;E Sheet Matrix



The origin of the multi-sheet matrix is the lower left corner of the Plot 1 border and is at coordinates of 100000, 100000. PS&E rows are 20 inches apart and the columns are 30 inches apart. The matrix can contain up to 40 sheets, but borders should only be placed as needed. Final sheet files should not contain any empty borders.

This method shall use the **PSE\_Sheet.dgn** WSDOT seed files to ensure that their master units are inches, and that WSDOT settings and tags are present and appropriate.

Use of the WSDOT Place Sheet utility assures compliance in regard to sheet sizes and consistent locations for use with the WSDOT Print Sheets utility.

Base references will be oriented to each sheet border. The sheet borders shall not be moved with this method.

The WSDOT Place Sheet utility automatically creates the correct saved views when the sheet borders are placed.

The WSDOT resources allow a base files to be referenced to a sheet border at the target drawing scale. Thus for a 1" = 50' plot the reference attachment scale is 1:50 (Master:Ref). Likewise for a 1" = 10' plot, the reference attachment scale is 1:10 (Master:Ref).

#### **Saved Views in Sheet Files**

A saved view should be created for each sheet location. The saved view name will be PLOT 1, PLOT 2, and so on. When the saved view is recalled, the entire sheet border should be displayed. If level filters are stored in the base file, the levels displayed by the saved view must match the levels that are to be plotted.

### Reference Attachments to Sheets

The levels displayed by the reference attachment and the levels stored in the base plan's saved view (and/or filter) used in the creation of that attachment must be kept in-synch with one another.

#### (b) Single Sheet per File Method

Placing a single sheet per file is required when using ProjectWise. It may also be acceptable for non-ProjectWise projects at the discretion of the WSDOT design project office as long as WSDOT standard sheet border cells are used and data is placed in accordance to all other WSDOT standards. Appropriate file naming conventions shall be followed per the **Deliverables 4** section of this manual.

All applicable base files may be referenced to a plan type container file for the specific purpose of level display control for the sheet files. This requires nested reference use and settings should be set accordingly so that the container maintains level display control of the sheets regardless of the levels displayed in the base files. No data shall be stored in the container file.

In this method, container files and sheet files shall be created from an appropriate WSDOT USFt seed file (**PSE\_Base.dgn** or **RW\_USFoot.dgn**).

All file references shall be scaled 1:1 coincident-world.

Each sheet file will contain one sheet border cell scaled and oriented to the referenced base information. The base information shall not be moved with this method.

In ProjectWise, title block information will be updated within MicroStation using the key-in "Titleblock Modify". Outside of MicroStation, update title block information in the files Properties > Attributes tab.

When using the single sheet-per-file method outside of ProjectWise, title block information is updated using the Edit Tags command on the sheet border cell.

Only those references displayed in the final contract plan set should be attached. Attachments that are not displayed should be detached.

There shall be no broken references in the final contract plan set. Any broken references should be repaired or detached prior to transmittal to the customer.

## D7.04 Drafting Deliverables

Contract plan sets shall be prepared in accordance with the WSDOT *Plans Preparation Manual* and this document. The *Plans Preparation Manual* contains guidance and requirements for content of final plotted R/W and PS&E plan sets. This document contains guidance, appearance, and standards regarding the electronic version of the plan set and the requirements and attributes specific to the electronic version.

For deliverables to WSDOT Headquarters Right of Way, see **Deliverables 8** of this manual.

## D7.04(1) General Requirements

### Project-Level Resources

Potential project-level custom resources may include cell libraries, dgn libraries, color tables, and plotting resources. All project specific CAD resources must be stored in the **CAD\RSC** folder. These resources must also be documented in the CAD Plan Set Documentation spreadsheet. Project-level resources by definition are non-standard which presents problems for downstream customers and exporting this data to other applications (such as InRoads); therefore their use should be minimized as much as possible.

### ByLevel Symbology

In the WSDOT environment, only one feature type is drawn on any given level, typically. So, **ByLevel** is the standard attribute setting for color, weight and linestyle for all standard WSDOT features. ByLevel is activated automatically by the Place WSDOT Items menu for all standard levels, but is not activated for levels designated as user levels.

### Project Filters

Users may create their own filters in specific DGN files or in the project-level DGNLIB. Project or user specific filters must be documented in the CAD Plan Set Documentation spreadsheet.

### User Levels

The WSDOT work environment contains many levels designated as user levels that have no standard feature assigned to them. Since users aren't allowed to create new levels, these user levels have been provided for project-specific requirements that necessitate the drawing of elements of non-standard, project specific features. Because any items drawn on user levels is by definition nonstandard, they will not translate and export to other WSDOT applications (such as InRoads) as easily as information drawn to WSDOT standards. For this reason, the use of nonstandard information on user levels should be kept to a minimum and must be documented.

Each MicroStation level has a name and level number associated with it. Project specific custom level names and numbers must not conflict with those provided in the **WSDOT.dgnlib** file.

### Referencing WSDOT Legacy 63-Level Data

If legacy MicroStation DGN files adhering to WSDOT's previous 63-level standards are to be used in conjunction with files in the current expanded level environment, the following guidelines should be observed:

- If the 63-level data is to be modified, it should be converted to the current standards.
- If the 63-level data is to be referenced read-only, it may be left in the 63-level configuration. At the time of attachment, a 63-level DGN file referenced to an expanded level file must have reference settings of Coincident World, True Scale off and attachment scale of 2:2 *not* 1:1. This must be done to maintain coordinate accuracy of the data between the two environments.

## D7.04(2) Data Organization

The **\_BaseFiles** folder and deliverable folders are intended to initially provide a workspace location for appropriate sheet files. When a workflow milestone is reached, a copy of the folder will be stored in the CAD folder and appended with the milestone in the *FolderName\_Milestone* format. All applicable sheet files and all necessary, referenced base files will be copied into the new *FolderName\_Milestone* folder.

The *FolderName\_Milestone* folder will represent a complete, stand-alone, deliverable package of the indicated milestone.

### Contract Plans (PS&E)

The **ContractPlans** folder is the working location for contract sheet files. At the time a milestone is completed, the *ContractPlans* folder will be copied to the same location and the copy will be appended with **\_Milestone** (where **Milestone** is replaced by a short description of the milestone). The *ContractPlans\_Milestone* folder represents the PS&E related contract plan set at a completed deliverable or milestone in an archive state and should not be changed in any way.

This folder may also be used for delivery to the design team of a complete package by a support group.

All required referenced base files will be copied to the *ContractPlans\_Milestone\ProductMasters* folder. All sheet files necessary for the deliverable will be stored in the *ContractPlans\_Milestone* folder.

For projects that require more complex file sets, the alternate sub-folder structure shown in **Deliverables 3** is acceptable.

File naming conventions will comply with **Deliverables 4**.

Example milestones include **\_PSE30**[percent], **\_PSE60**, **\_PSE90**, **\_AdReady**.

For delivery of support group deliverables to the design team, similar milestone indicators are acceptable. For example, *ContractPlans\_Traffic*, and *ContractPlans\_Landscape*.

At delivery, the *ContractPlans\_Milestone* folder will represent a complete, stand-alone, deliverable package of the indicated milestone.

### Addendums

Addendum sheets are stored in the *ContractPlans\_AD[dendum]#* folder. At completion of the addendum, a copy will be made of the *ContractPlans* working folder and the copy will be appended with **\_AD#** (where **#** is the addendum number). This folder will contain only the files relating to the current addendum. This includes all required referenced base files and only specifically applicable/revised sheet files. All other files will be deleted.

All required referenced base files will be copied to the *ContractPlans\_Milestone\ProductMasters* folder. All sheet files necessary for the deliverable will be stored in the *ContractPlans\_Milestone* folder.

File naming conventions will comply with **Deliverables 4**.

At delivery, the *ContractPlans\_AD#* folder will represent a complete, stand-alone, deliverable package of the indicated addendum in an archive state and should not be changed in any way.

### **D7.04(3) Plans for Approval**

The *PlansForApproval\_Milestone* folder stores the intersection/interchange plan set for approval. At completion of the deliverable/milestone, a copy will be made of the *PlansForApproval* working folder and the copy will be appended with **\_Milestone** (where **Milestone** is replaced by a short description of the milestone). This folder will contain only the files relating to the Plans for Approval.

All required referenced base files will be copied to the *PlansForApproval\_Milestone\_ProductMasters* folder. All sheet files necessary for the deliverable will be stored in the root *PlansForApproval\_Milestone* folder. Example Milestones include **\_Submitted**, **\_Approved**.

File naming conventions will comply with **Deliverables 4** of this manual.

At delivery, the *PlansForApproval\_Milestone* folder will represent a complete, stand-alone, deliverable package of the indicated PFA milestone.

### **D7.04(4) Right of Way**

This section refers to non-ProjectWise PS&E project efforts only. For ProjectWise projects and deliverables to WSDOT HQ Right of Way, see **Deliverables 8**.

The **RightOfWayPlans** folder stores design team generated Right of Way (R/W) plans. Survey generated R/W plans will be stored the Survey workspace. At completion of the deliverable milestone, a copy will be made of the **RightofWay** working folder and the copy will be appended with **\_Milestone** (where **Milestone** is replaced by a short description of the milestone). This folder will contain only the files relating to the Right of Way plans in an archive state and should not be changed in any way.

All required referenced base files will be copied to the *RightOfWay\_Milestone\_ProductMasters* folder. All sheet files necessary for the deliverable will be stored in the root *RightOfWay\_Milestone* folder.

File naming conventions will comply with **Deliverables 4**.

At delivery, the **RightOfWayPlans** folder will represent a complete, stand-alone, deliverable package of the indicated R/W plan set.

### **D7.04(5) CAD Documentation**

CAD documentation is required on all deliverables. This documentation is available in the WSDOT standard CAE project structure under **CAD\ContractPlans** as a Microsoft Excel spreadsheet (\*.xlsx) with six major components in separate worksheet tabs. The six components are:

- CAD Project Info

- CAD Project Journal
- CAD Project Level Resources
- Base Plan Documentation
- Contract Plans – Multiple Sheets per file
- Contract Plans – Single Sheet per file

Each worksheet noted in this section is also available in **Forms 6**.

At each deliverable milestone for each CAD product, a **\_Doc** subfolder will be added to the deliverable folder. The CAD documentation spreadsheet will be stored in the **\_Doc** folder. If individual forms are used, each one will be stored in this folder. All documentation files will be pre-pended with the project ID followed by an underscore ( \_ ). For example: **XL1234\_CADProjectDoc.xlsx**.

### **CAD Project Information Sheet**

The *CAD Project Information* worksheet tab contains general project and contact information. Entering information in this tab first will populate common fields in the other tabs.

The following items should be documented:

- Project ID
- Project title
- Network location
- Mainline designation(s) and mile post limits
- Design project office and contact information
- Sheet border information

### **CAD Project Journal**

The *Project Journal* worksheet tab contains a log of events and decisions made at the CAD development level. This resource should include the name of the person making the entry, date, entry, and reference to associated or supporting files.

### **Project Level Resources Sheet**

The *Project Level Custom Resources* worksheet tab contains the following items and should be documented:

- Project ID
- Project title
- Custom cell library information
- Custom linestyle information

- Custom or Project DGN library information
- Any other project custom resources including plot drivers, pen tables, color tables, etc.

### Base Plan Documentation Sheet

At delivery a *Base Plan Documentation* worksheet tab will be filled out for each Base Plan and stored in the deliverables folder along with the data files. For additional Base Plans, copy the form and paste it in the same tab, below the existing form. If not using the Excel spreadsheet, additional forms for each Base Plan will be stored in the deliverables folder.

The following items should be documented for each base plan file:

- Drawing Scale
- Units of Measure (US Feet standard for WSDOT)
- Units of Resolution (1,000,000,000 standard for WSDOT)
- Datum information
- Raster Reference information including origins
- Referenced DGN files
- Filters/saved views to be used to call up sheet views

### Contract Plan File Documentation Sheet

The Contract Plan File Documentation sheet is the fifth tab labeled *Contract Plans – Multi* in the [ID1234]\_CADProjectDoc.xlsx spreadsheet. At delivery, the Contract Plan File Documentation spreadsheet will be filled out for each sheet file and stored in the deliverable folder along with the data files. For single sheets per DGN methodology, an additional tab is provided and labeled *Contract Plans - Single*.

The following items should be included in documentation for each sheet contained in a sheet file:

- Plan type(s) included
- Sheet ID
- Sheet saved views
- Referenced data files and raster images
- Custom filters

## D7.05 Project Closure and Transition

The following requirements will apply after the supplier has prepared a complete MicroStation CAD package (such as PS&E contract plans) as described in this chapter by preparing all the appropriate electronic information.

### **D7.05(1) Project Cleanup**

The deliverable contract plan set shall contain the base plans, sheet files, and documentation (**CAD\ContractPlans\_Milestone** folder or similar for PFA and R/W), backups of resources used (**CAD\Rsc** folder) and any other supporting information necessary for the customer and/or future designers to understand and use the plan set in MicroStation. All data not necessary for production of the final plan set or of use to future designers or drafters should be removed from the deliverables folder.

### **D7.05(2) Preparation of PS&E Data within CAD-Folder**

The following must be provided in the **CAD\ContractPlans** folder:

- Completed PS&E Plan set checklist
- **\_Rsc** subfolder. This subfolder is to be created at project finalization. The resource files needed to recreate the contract plan set must be copied to this location. Resource files that should be copied are all cell libraries, linestyle resource files, DGN libraries (both WSDOT standard and project specific, font resource files and color tables.
- All Base files used in contract plan set
- Documentation as described in previous section

### **D7.05(3) Delivery of Final Package**

General requirements for the transfer, review and acceptance of the data are detailed in **Deliverables 2**.

A complete contract plan set (PS&E, PFA, or R/W) package will be prepared as described in this chapter by compiling all the appropriate electronic information and notifying the customer that the project has been finalized.

Delivery will be accomplished by providing the customer access to the project folder if both the design team and customer share a network resource that allows them both to reference the same folder structure or ProjectWise if applicable. Access to the entire project folder is necessary when transferring interrelated survey, design and CAD data sets.

If a shared network location is not an option, the design team will provide the customer with a copy of the final data. This can be accomplished using any medium that can reliably contain the entire folder structure to be transferred (e.g., an e-mail, an FTP site, a compact disk, or a DVD).

### **D7.05(4) Data Archival**

On projects where the supplier is internal to WSDOT, it is the supplier who is responsible for archival of the final electronic design data per the region's policy for archival of electronic project data. When an external supplier is providing data to WSDOT, it is the WSDOT customer who is responsible for archival of the final electronic data in accordance with the region's policy.

If no regional archival policy exists, the responsible party needs to ensure the data is appropriately archived for future reference.