
Chapter 1 - Introduction & Overview

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Chapter 1

1.1 Introduction

The Virginia Department of Transportation (VDOT) has established standards and procedures for the electronic development and delivery of Right of Way and Construction plans.

As the first step in this process, the VDOT CADD Committee has adopted MicroStation as its standard graphics package. MicroStation is a drafting package developed, marketed and sold by Bentley Systems Inc. The committee has also adopted GEOPAK by Bentley Systems Inc. as its standard road design system with modifications to meet VDOT standards and FALCON as our file management system.

OpenRoads technology will be used by VDOT staff and consultant design firms on all minimum plan projects and above where new survey was completed on or after January 1, 2016.

As an option, OpenRoads technology can be used on other projects that were surveyed before January 2016 if these projects have not entered the Public Involvement phase.

See Appendix J for [MicroStation /OpenRoads Standards 2016*](#).

The utilization of one standard drafting and design package provides standards for files which can be utilized by survey, designers, and construction. Also, VDOT's project management, construction estimating and other computerized design systems for Traffic Engineering, Right of Way/Utilities, Structure and Bridge, Environmental Quality, and Materials are being interfaced to utilize the standard files created by the drafting and design programs.

The adoption of a standard drafting and design package allows the Department to utilize electronic data that has been developed by consultants to complete projects that might be recalled or re-assigned. This would also apply to those projects being designed by the Department and assigned to a consultant to be completed.

Also, the Department has developed standards for the delivery of electronic files to the private sector contractors for design and construction bidding. This process utilizes VDOT Standards for design files and our file Management system.

* Rev 6/17

1.2 Overview

1.2.1 Additional Division's Standards

The CADD Manual will include standards for all Preliminary Engineering Divisions including the addition of separate chapters for Structure and Bridge, Landscape, Hydraulics, Right of Way, Utilities and Environmental. Although the manual will be maintained by Location and Design Division, each of the Division's support groups will be responsible for setting and maintaining the standards for their respective division. The Location and Design CADD Support Group will provide support and guidance to other divisions as needed to insure that their standards are consistent.

This manual will be revised by the respective support groups as needed to insure that it is up to date with VDOT standards.

NO CADD STANDARDS, CELLS, TEXT SIZES, FONTS, ETC., ARE TO BE REVISED BY ANYONE OUTSIDE THE SUPPORT GROUPS OF THE RESPECTIVE DIVISIONS.

If you have suggestions, corrections or additions of which we strongly encourage and appreciate, please submit them to the CADD support group via phone: 804 786-1280, E-mail: CADDsupport@Vdot.Virginia.gov , fax: 804 786-5157 or interoffice mail. All correspondence will be forwarded to the appropriate individual or Division for immediate review and be evaluated and brought to the attention of the appropriate Standards Committee. The Standards Committee will then determine whether or not to incorporate your suggestion into the standards.

The standards set forth in this manual were developed to be used in conjunction with, and to meet the requirements of, the policies and procedures as stated in the VDOT [Road Design Manual](#), A Policy on Geometric Design of Highways and Streets by AASHTO, Divisional Instructional and Information Memoranda (IIM) and other guidelines as set forth by the Virginia Department of Transportation.

1.2.2 The Appendices

All of the cells and symbols which are needed for the development of roadway plans have been created by the CADD Support Section. The use of these cells and symbols will ensure the standardization of all roadway plans being developed by VDOT. These cells and symbols are stored in the various cell libraries located in the directory coapp52/proj/supV8i/cells. The appendices at the back of this manual include a Table of Contents and links to graphic examples of these cells and symbols.

In addition to providing standard cells and symbols, the support groups have also developed many macros (a stored set of instructions or short cuts), programs and menus to assist the CADD designer in developing the plans. These standards and instructions are located in Chapter 3 and the appendices.

1.2.3 Software Packages

The software packages used by the Virginia Department of Transportation for design are as follows:

MicroStation: A Computer Drafting software package.

MicroStation is marketed and distributed by Bentley Systems Inc. of Exton, Pennsylvania as well as some third party vendors.

Falcon: An Oracle based file (document) management system.

A TSA Advet product

GEOPAK: An Engineering Road Design Software Package.

OpenRoads Technology: A new Engineering 3-D Road Design Software Package built into GEOPAK.

GEOPAK / OpenRoads Technology* is marketed and distributed by Bentley Systems Inc. of Exton, Pennsylvania.

TRNS.PORT: A Bid Analysis and Management System. This product is used to produce engineering estimates, proposals, manage bid letting, analyze bids, decide on awards and manage construction and payment activities.

An AASHTO product

* Rev 6/17

CADConform Server: CADD Design Standards checking software. This product is used to check the validity of CADD standard items in MicroStation design files.

This product is marketed and distributed by Altiva Software, Inc. of Houston, Texas.

GUIDESIGN: A tool for creating roadway and highway sign panels.

A Transoft Solutions Inc. Software package

AUTOTURN: A CADD –based program that simulates low speed turning maneuvers for highway vehicles.

A Transoft Solutions Inc. Software package

AGI 32: A CADD – based lighting design program.

Lighting Analysts

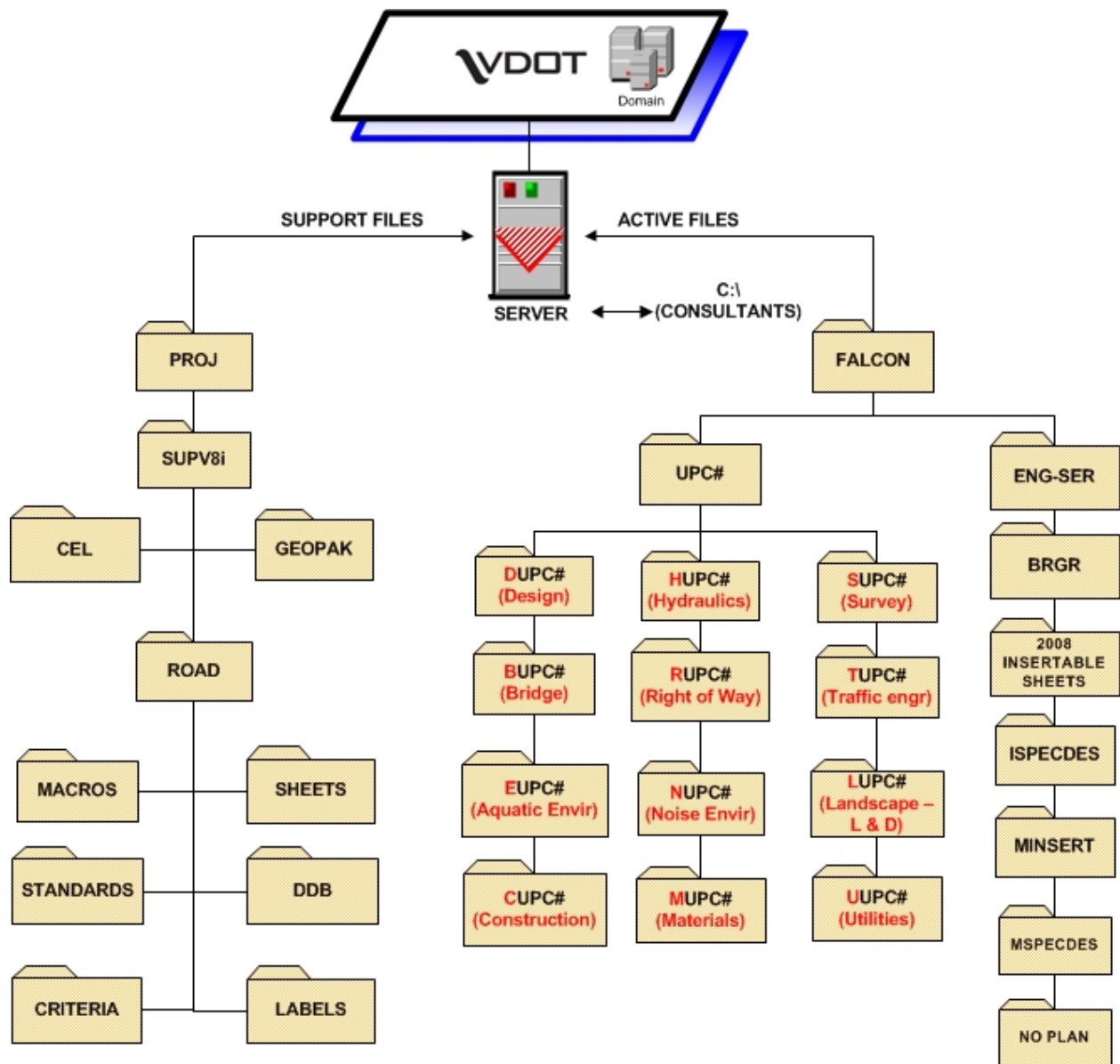
Illumination engineering software

Littleton, Colorado U.S.A.

For licensing information for Consultants, see [Chapter 8 Section 17](#) in this manual.

Table 1-1 Directory Structure

The directory structure for all VDOT projects is shown below:



1.3 Falcon File Management System

1.3.1 About Falcon

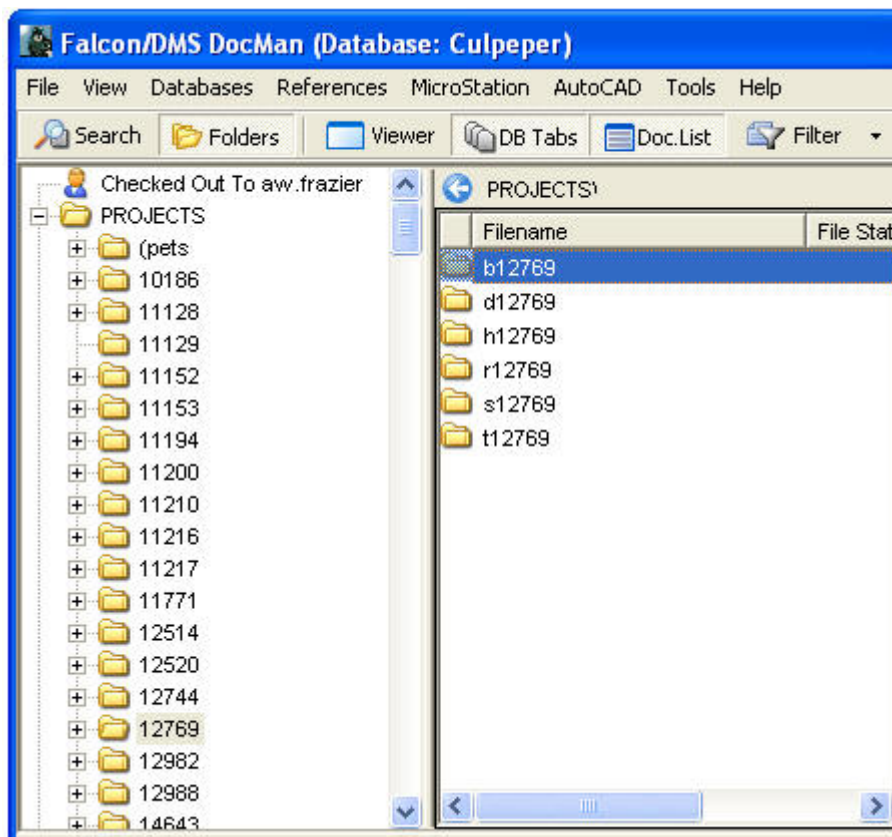
All project related files should be stored in Falcon under individual UPC number.



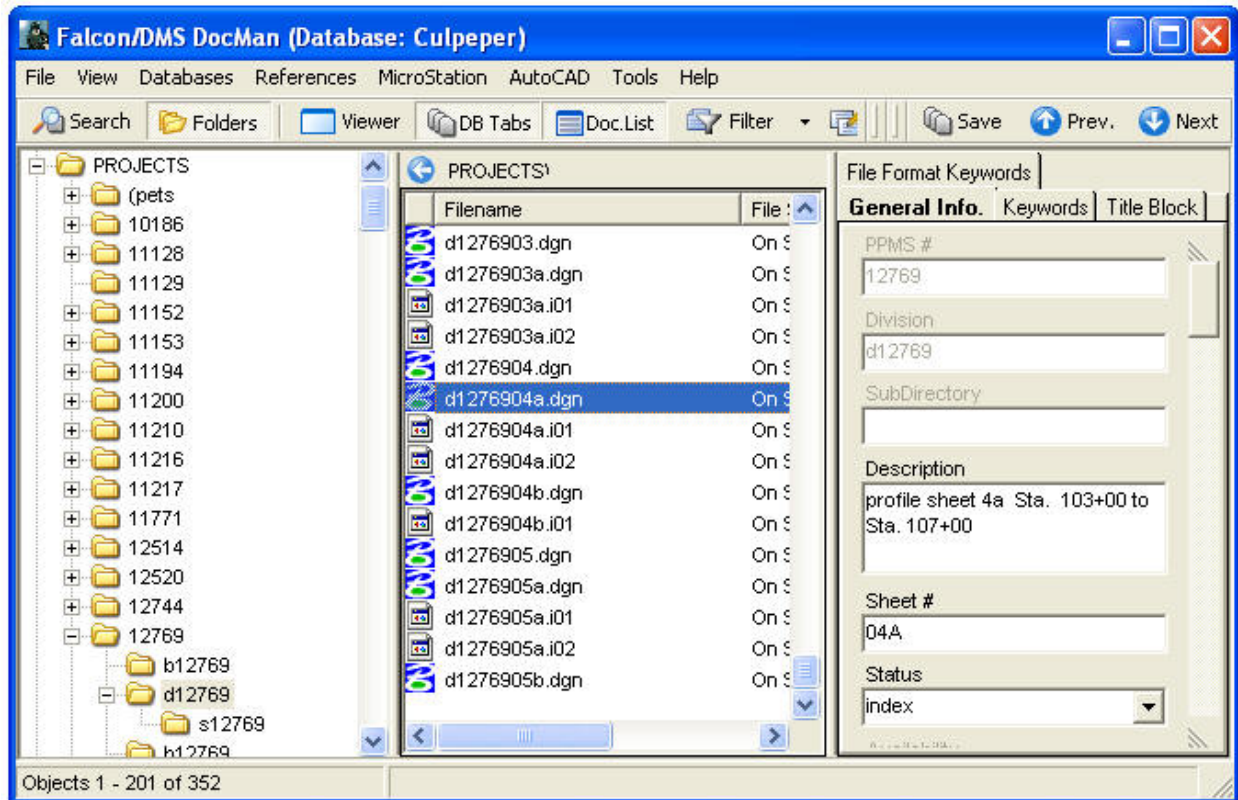
All users must use [SARA](#) (VDOT's System Access Request Application) to request access to each project Users will be notified once access is given.

The **DocMan** user interface for the Falcon/DMS document management suite is a “panes-based” application used to manage, search for and view documents. The panes can be resized and toggled on and off in various combinations to produce an interface that is easily configured for different document management tasks. The DocMan's Windows Explorer- like interface allows you to view both files and information stored in each document's database record and to easily identify a documents “**Availability**”.

Falcon's directory structure has a folder for each project and a sub-folder for each discipline used in that particular project as shown below.



The sub-directory opens to each file and shows the database information for that file as shown below:



For additional information see [Instructions for Using Falcon V6](#)

1.3.2 HMR Files Require Special Handling in Falcon

GeoTiff Bitmap files (hmr files)(VGIN) are large photographic images by nature. It is imperative that all hmr files are copied to your hard drive and **NOT** saved to **Falcon**. If your PC crashes or the computer is re-imaged go back to the source of the file and copy it again.. You may zip the file if you are worried about space on your PC. The file can then be extracted and referenced from your PC to the dgn file. This will cut down on network traffic and the amount of time that it would take to load the hmr reference files in **MicroStation**.

1.4 Falcon Plan File Room Folder Structure

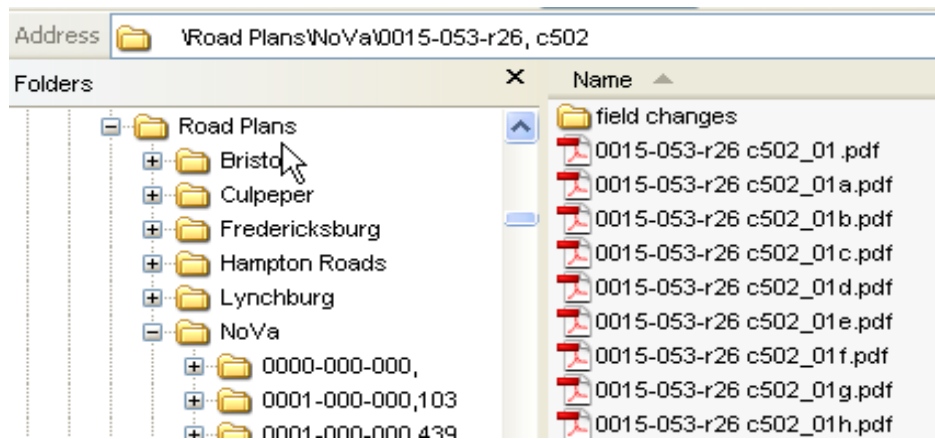
1.4.1 Road Design

Road Plans

Districts

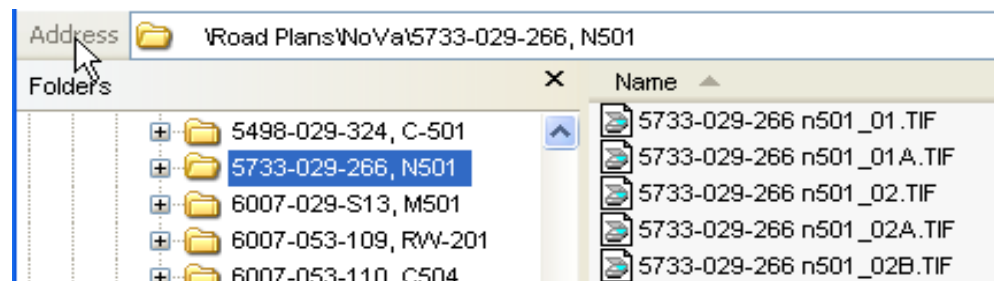
Projects (Folder)

- 0123-012-354, C501(Folder name will be the project number)
- Files will be named project number underscore sheet number 0123-012-345 c501_01
- **Formal Construction Revisions** (File name will be same as mentioned above) Existing files will be overwritten.



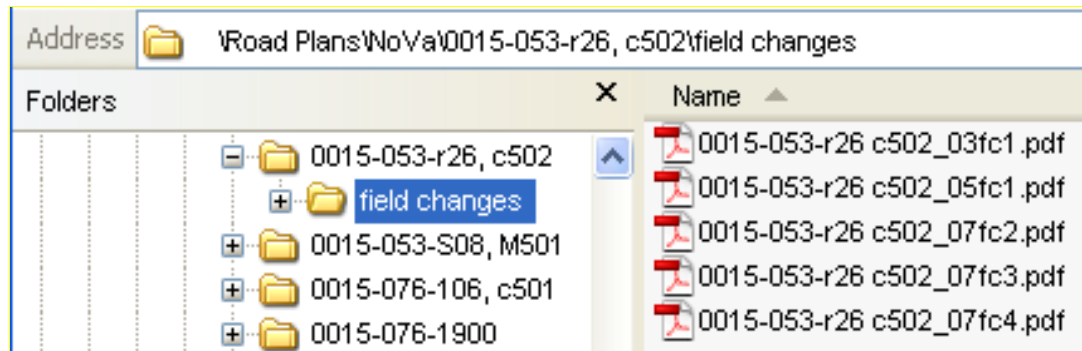
No Plans (Folder)

- 3456-078-231, N501(Folder name will be project number)
- Files will be named project number underscore sheet number 3456-078-231 n501_01
- **Formal Construction Revisions** (File name will be same as mentioned above)



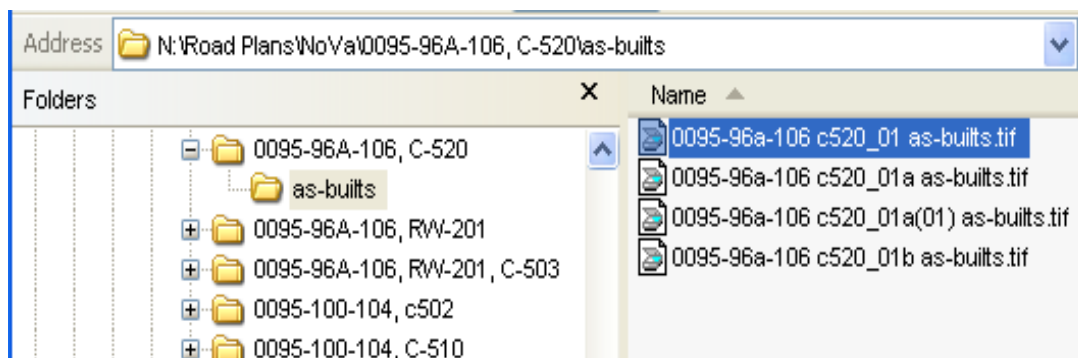
Field Changes (Folder)

- See [IIM-CD-2013-12.01](#)
- Files will be named project number underscore sheet number 0123-012-345 c501_01fc1, fc2 and so on



As-builts (Folder)

- **Only required for Structure & Bridge and Design Build Projects**
- Files will be named project number underscore sheet number 0095-96a-106 c520_01 as-builts, 02 as-builts and so on



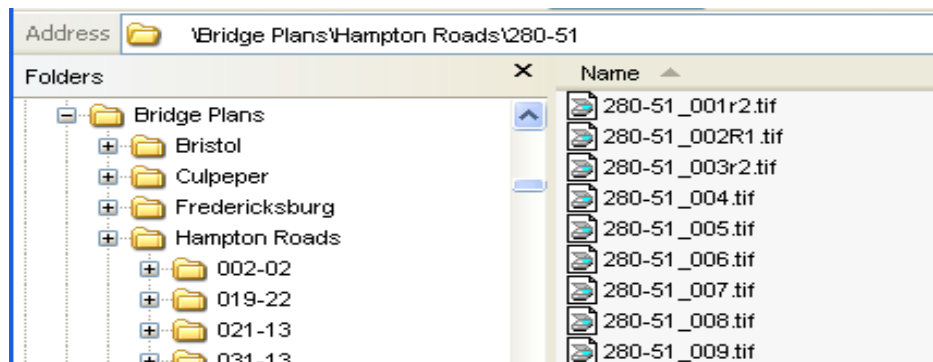
1.4.2 Bridge Design

Bridge Plans

Districts

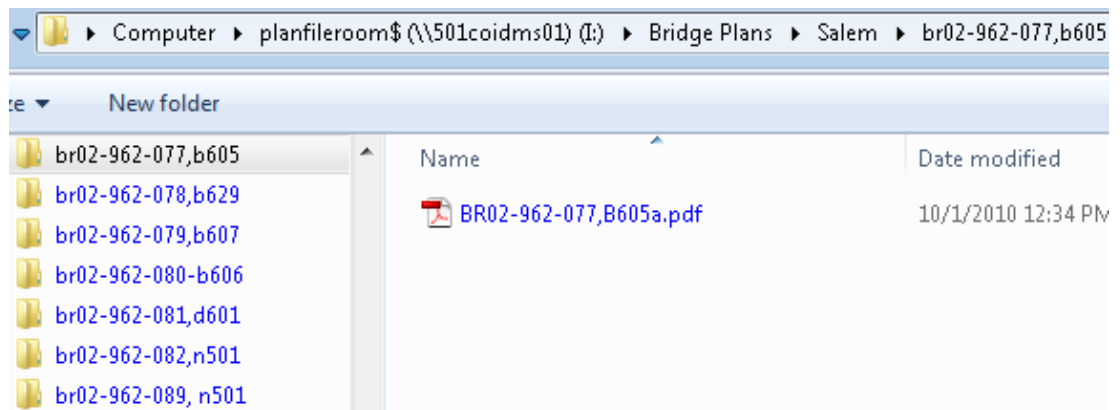
Projects (Folder)

- 012-34a (Folder name will be the plan number)
- Files will be named plan number underscore sheet number (012-34a_01)
- **Formal Construction Revisions** (will be named project number underscore sheet number r1, r2 etc.)



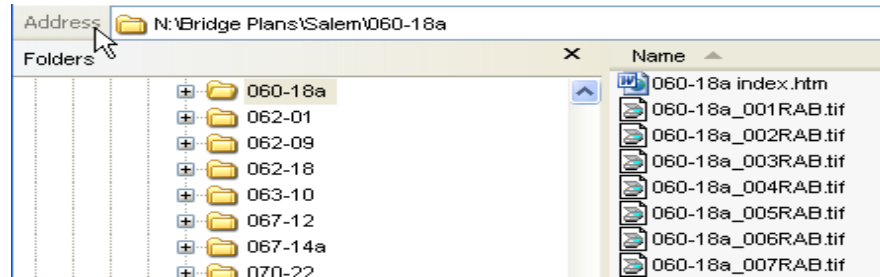
No Plans (Folder)

- Brdg-123-456, b601 (Folder name will be project number)
- Files (will be named project number underscore sheet number brdg-123-456 b601_01)
- **Revisions** (will be named project number underscore sheet number r1, r2 etc.)



As-builts (Folder)

- 012-34a (Folder name will be plan number)
- Files will be named plan number underscore sheet number 012-34a_01AB or RAB)



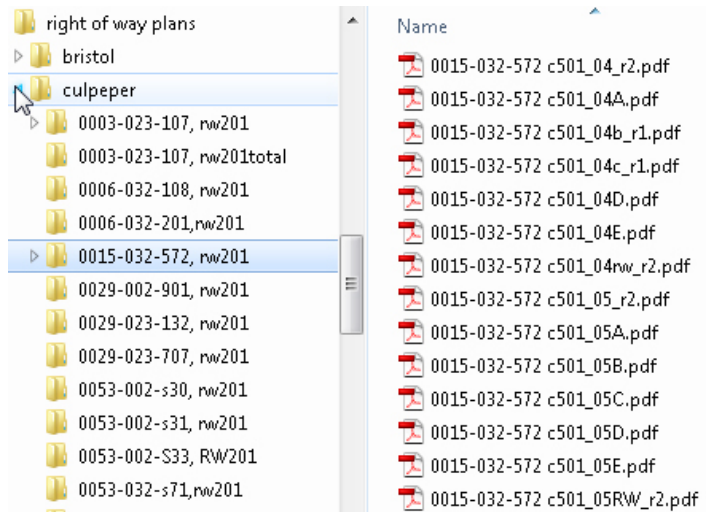
1.4.3. Right of Way Design

Right of Way Plans

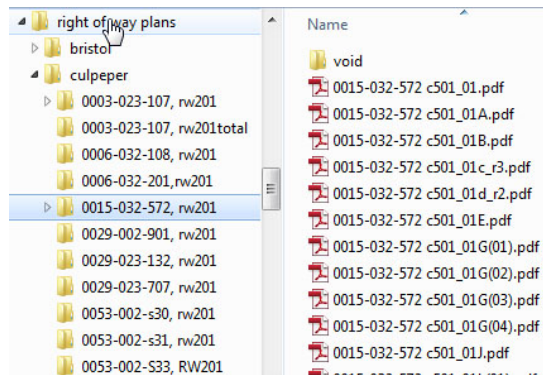
Districts

Projects (Folder) Partial

- 0123-012-354, RW201 (Folder name will be the project number)
- Files will be named project number underscore sheet number 0123-012-345 C501_01.
- **Formal Right of Way Revisions** (will be named project number underscore sheet number _r1, _r2, _r3 etc. to each sheet.) The revision number will be depicted on the revision data sheet in the upper left corner of each revision with this symbol **R1** containing the corresponding (revision) r number inside.



- **Old files** will be moved to a Void folder under the project folder by CADDSupport.

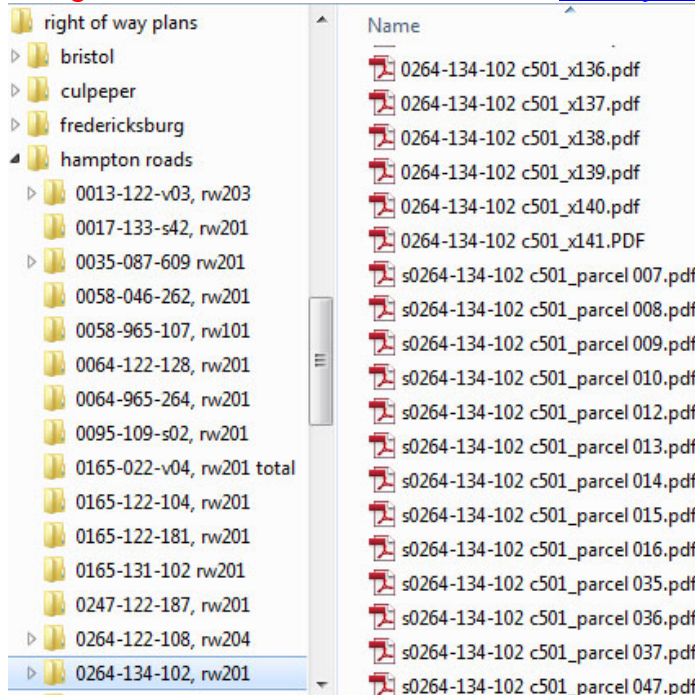


Projects (Folder) Total

- 0123-012-354, RW201Total (Folder name will be the project number)
- Files (will be named project number underscore sheet number 0123-012-345 c501_01Total)

Plats (Folder) Files will be named s project number underscore parcel number s0123-012-345 c501_parcel001, 002 and so on.

Plats are only used in certain situations. This is to show how they are named when being used. For more information, see [Survey Manual](#)



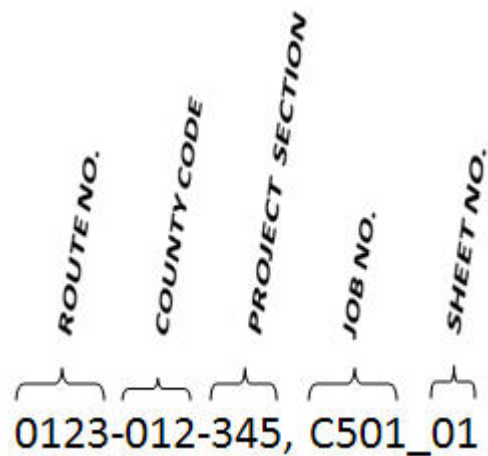
All Project folders and file names will have a space before the c, rw, m or n number

For additional information on accessing the Plan File Room see [Appendix E](#) in this manual.

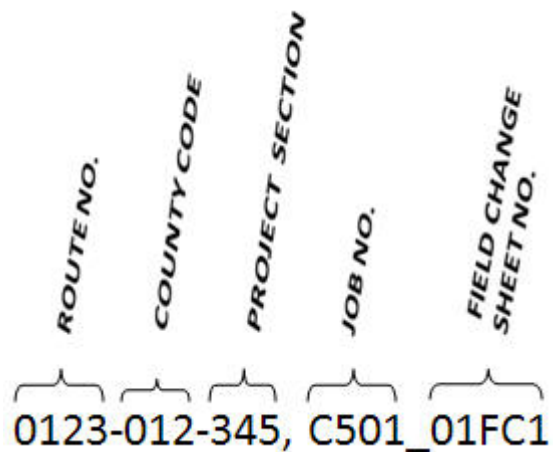
1.5 Falcon Plan File Room Project Naming Structure

1.5.1 Project Numbers

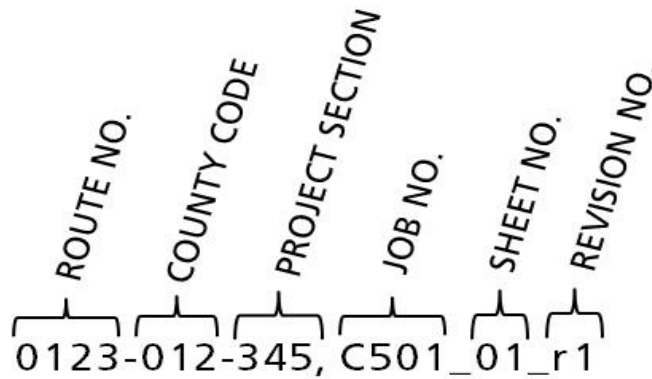
Project numbers consists of a combination or series of numbers and letters that tell you all about that project. Below is a simplification of that naming convention:



Project Number



Project Number for Field Change



Project Number for R/W Revisions

1.5.2 Route Numbers

Another example is 0640 which refers to route number 640. Route numbers for secondary roads are 600 and above. 600 and above route numbers are particular to a specific county, therefore Route 612 in one county will not necessarily be the same route in another county although that county may have a Route 612. Numbers below 600 are Primary routes.

1.5.3 County Code

020 indicates the location and is a county/city code. 020 is the code for Chesterfield County.

1.5.4 Project Section

345 refers to the project section. Projects which were assigned an F or V prior to June 1995 will not be changed. Instead of an F or V, an identifier is added as a prefix to the project number.

1.5.5 Job Number

The project numbers include Job Numbers which are classified as:

- 100 - Preliminary Engineering (Coded PE)
- 200 - Right of Way (Coded RW)
- 300 - Grading & Drainage (Coded G)
- 400 - Paving (Coded P)

- 500 - Construction (Coded C)
- 600 Bridges (Coded B) or Major Drainage Structures (D)
- 700 - Flashing Light Signals (Coded FS)
- 800 - Landscaping (Coded L)
- 900 - Signing (Coded S)

Other codes are:

P = paving, G = grading, L = landscaping, B = bridge, M = minimum plan, N = no plan, D = box culvert/drainage structure, FS = flashing signal (railroad crossing), S = sign plan

No Plan Projects are simple projects where plans may or may not be necessary. There are instructions and necessary sketches for these projects in the [Road Design Manual](#), Appendix A.


1.5.6 Sheet Number Field Changes

Sheet Numbers are assigned according to what phase of project is applicable. [See Table 3-2 in Chapter 3](#) for sheet numbering conventions.

Field Changes See [IIM-CD-2013-12.01](#)

Files will be named project number underscore sheet number 0123-012-345 c501_01fc1, fc2 and so on.

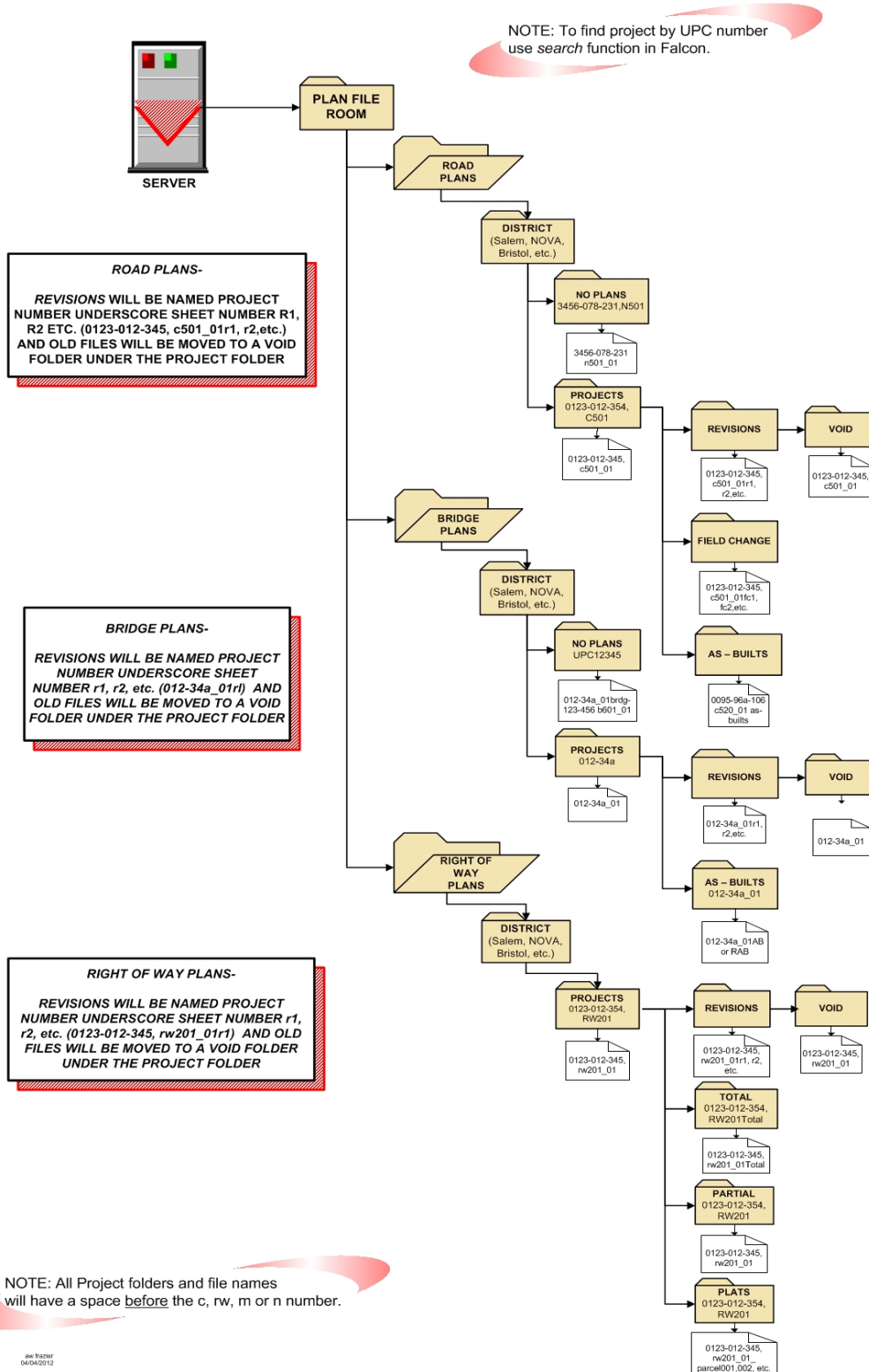
1.5.7 Sheet Number Formal Right of Way Revisions

Formal Right of Way Revisions will be named project number underscore sheet number _r1, _r2, _r3 etc. to each sheet. The revision number will be depicted on the revision data sheet in the upper left corner of each revision with this symbol  containing the corresponding r number inside.

Old files will be moved to a **Void** folder under the project folder by CADDSupport.

Table 1-2 Plan File Room Directory Structure

The Plan File Room directory structure for projects has been established as shown below:



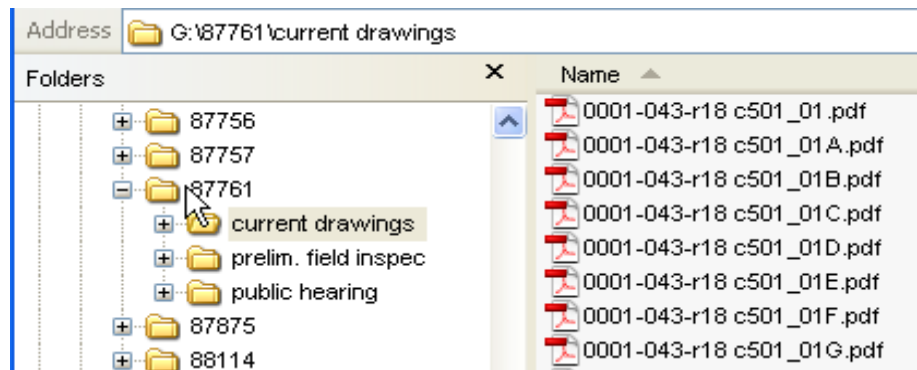
1.6 Falcon Archives Folder Structure

1.6.1 Archiving Plans

Projects (Folder)

- **UPC number** (Folder name will be the upc number)
 - **Current Drawings** (Folder)

Files (will be named project number underscore sheet number 0123-012-345 c501_01)
Updated files will over write existing files



- **Archived milestones** (Files will not be over written, files must be deleted before re-archiving) For additional information on archiving see diagram on next page, [Chapter 8 Electronic Deliverables](#) and [Appendix E Falcon](#) in this manual
 1. **Preliminary Field Inspection**
 2. **Public Hearing**
 3. **Citizen Information**
 4. **Field Inspection**
 5. **Right of Way Partial**
 6. **Right of Way Total**
 7. **Advertisement Submission**

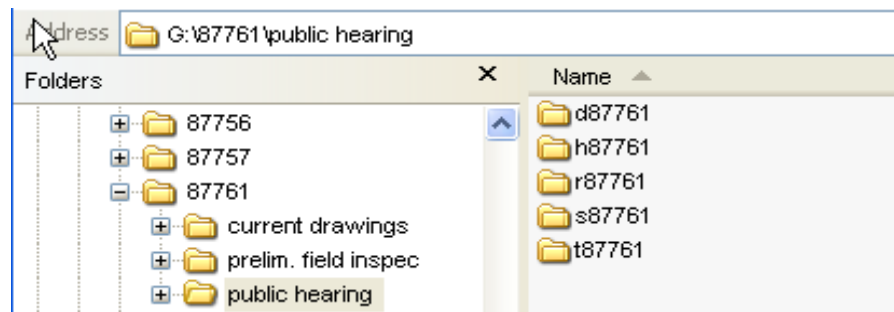

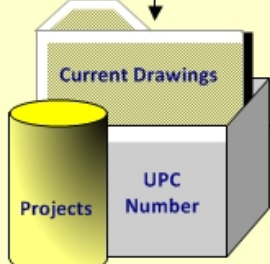
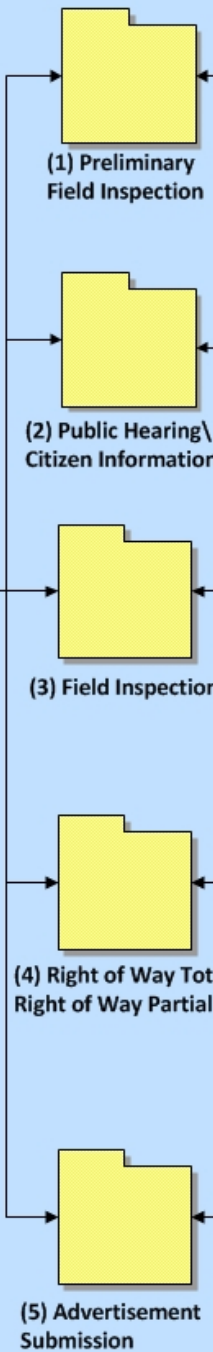


Table 1-3 - Stages for Archiving Files

ARCHIVING FILES																												
Archive Plans in Falcon	Stages to Archive Plans	Directories included in Archiving	*Files included in Archiving																									
 <p>USER</p>  <p>FALCON</p> <p>NOTES:</p> <p>MAKE SURE THAT ALL REFERENCED FILES ARE INCLUDED IN ARCHIVE FOLDER.</p> <p>MAKE SURE GENERAL INFORMATION, DIRECTORY & KEYWORDS, FILE FORMAT KEYWORDS ARE FILLED OUT.</p> <p>SEE LD-436 FOR MORE DETAILED INFORMATION.</p> <p>* FILES LISTED MAY NOT INCLUDE ALL FILES NEEDED TO MAKE ARCHIVED FILES COMPLETE.</p>	 <p>(1) Preliminary Field Inspection</p> <p>(2) Public Hearing\ Citizen Information</p> <p>(3) Field Inspection</p> <p>(4) Right of Way Total/ Right of Way Partial</p> <p>(5) Advertisement Submission</p>	<table border="1"> <tr><td>dUPC# - Roadway</td></tr> <tr><td>sUPC# - Survey</td></tr> <tr><td>hUPC# - Hydraulics</td></tr> <tr><td>tUPC# - Traffic</td></tr> <tr><td>IUPC# - Landscape</td></tr> </table> <table border="1"> <tr><td>dUPC# - Roadway</td></tr> <tr><td>sUPC# - Survey</td></tr> <tr><td>hUPC# - Hydraulics</td></tr> <tr><td>tUPC# - Traffic</td></tr> <tr><td>IUPC# - Landscape</td></tr> </table> <table border="1"> <tr><td>dUPC# - Roadway</td></tr> <tr><td>sUPC# - Survey</td></tr> <tr><td>hUPC# - Hydraulics</td></tr> <tr><td>tUPC# - Traffic</td></tr> <tr><td>IUPC# - Landscape</td></tr> </table> <table border="1"> <tr><td>dUPC# - Roadway</td></tr> <tr><td>sUPC# - Survey</td></tr> <tr><td>hUPC# - Hydraulics</td></tr> <tr><td>tUPC# - Traffic</td></tr> <tr><td>IUPC# - Landscape</td></tr> </table> <table border="1"> <tr><td>dUPC# - Roadway</td></tr> <tr><td>sUPC# - Survey</td></tr> <tr><td>hUPC# - Hydraulics</td></tr> <tr><td>tUPC# - Traffic</td></tr> <tr><td>IUPC# - Landscape</td></tr> </table>	dUPC# - Roadway	sUPC# - Survey	hUPC# - Hydraulics	tUPC# - Traffic	IUPC# - Landscape	dUPC# - Roadway	sUPC# - Survey	hUPC# - Hydraulics	tUPC# - Traffic	IUPC# - Landscape	dUPC# - Roadway	sUPC# - Survey	hUPC# - Hydraulics	tUPC# - Traffic	IUPC# - Landscape	dUPC# - Roadway	sUPC# - Survey	hUPC# - Hydraulics	tUPC# - Traffic	IUPC# - Landscape	dUPC# - Roadway	sUPC# - Survey	hUPC# - Hydraulics	tUPC# - Traffic	IUPC# - Landscape	<p>Roadway</p> <ul style="list-style-type: none"> Master Design File Master Profile File Master Cross Section File for each roadway Working files for each roadway (patterns, shapes, template separators, etc.) GEOPAK Files Plan Sheets Profile Sheets (3a,4a,5a, etc). Entrance Profile Sheets Cross Section Sheets PDF Files (Title Sheet, plan, profile, typicals, cross sections, etc.) <p>Survey</p> <ul style="list-style-type: none"> Master Survey File Master Utility File Master Contour File Tin File Property Owner File; where applicable Wetland File where applicable Master 3D Points & Breaklines File where applicable Master Bridge Situation File where applicable Any updated Survey files are shown and named in accordance with LDSM-11. <p>Hydraulics</p> <ul style="list-style-type: none"> Master Design File Erosion and Sediment Control Design File (if applicable) Drainage Description File (if applicable) Stormwater Management Design Details File(cross sections, details, etc.; if applicable) <p>Traffic</p> <ul style="list-style-type: none"> Master Traffic Signal Design File located in the Signals sub-folder Master Roadway Lighting Design File t; located in the Lighting sub-folder Master Pavement Marking Design File; located in the Pavemark sub-folder Master Signing Design File located in the Signing sub-folder Master ITS/TMS Design File located in the ITS sub-folder Sheet Files for appropriate master files located in a the appropriate sub-folders <p>Landscape</p> <ul style="list-style-type: none"> Master Design File I+(upc#).dgn Sheet Files for appropriate master file
dUPC# - Roadway																												
sUPC# - Survey																												
hUPC# - Hydraulics																												
tUPC# - Traffic																												
IUPC# - Landscape																												
dUPC# - Roadway																												
sUPC# - Survey																												
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hUPC# - Hydraulics																												
tUPC# - Traffic																												
IUPC# - Landscape																												

1.6.2 Archiving Plans for Design Build Projects

In order to ensure records are up to date and accurate for Design-Build Projects, the Alternate Project Delivery Section (APD) in the Location and Design Division (L&D) has determined a need to capture data at various phases of the project delivery process (both pre and post-award) in Falcon. It is critical to house this documentation electronically in a centralized repository where it can be accessed by anyone from VDOT.

All plans shall also be submitted in electronic format using the provided versions of MicroStation CADD software. Files shall be submitted in both DGN & PDF formats, by way of VDOT's Falcon Consultant environment. The Design-Builder will complete form [LD-443, the Falcon System Access Security Agreement](#) and the [Falcon Access Request Form](#), for access to the Falcon Consultant environment. These forms are available in the RFP Information Package. VDOT will furnish electronic files of all applicable standard detail sheets upon request by the Design-Builder. The files will use standard VDOT cell libraries, level structures, line types, text fonts, and naming conventions as described in the most recent version of the VDOT CADD Manual and VDOT's Manual of the Structure and Bridge Division, Vol. V- Part 2, Design Aids and Typical Details. Files furnished to the Design-Builder in electronic format shall be returned to VDOT and removed from the Design-Builder and its designer's computer equipment upon completion of this Project.

Post award submittals are provided at the Right of Way (ROW) Phase and Construction (CN) Phase. Submittals are also provided post construction at the As-Built Phase. Archiving Plans into a complete and comprehensive package containing all plan related documentation at one time will allow project to be viewed as a whole. There are currently no parameters in place regarding the electronic storage of the post-award documentation.

APD has been working with the CO Plan Coordination Section of L&D to develop folders in Falcon, under the archive environment, to store the appropriate documentation (both pre and post award). Documentation will be provided in the following categories under the UPC for a particular project in the archive environment:

- RFQ
- RFP
- ROW Submittals
- CN Submittals
- As-Built Plans

District Project Managers will be responsible for ensuring ROW and CN Submittals and As-Built Plans are uploaded in Falcon under the archive environment. This will require coordination with the Plan Coordination Section. For future procurements, a more formalized process will be set up wherein the PM-APD will work with the CO L&D POC to have pre-award documentation uploaded. The post award process will remain the

same. It is suggested that updates be performed at regular intervals – when a particular plan set is approved or a work package is signed off on. This process needs to transpire on a regular basis.

1.6.2.1 Instructions

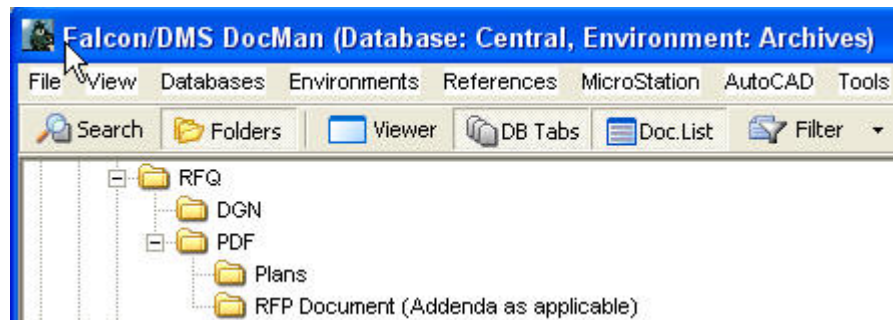
For future solicitations, the following structure is requested for organization and document uploading to Falcon’s Archive Environment. Please note the PM-IPD is responsible for working with the CO POC for L&D to post the PDFs (including all RFQ Information Package components all RFP Information Package components, the RFQ, RFP and Final Contract Documents). The PM-D will be responsible for working with the CO POC for L&D as necessary, and Plan Coordination to post the Post Award Documentation. It is suggested that they do this on a monthly basis once they receive the Monthly Work Package and review a particular submittal so that personnel can readily access updates on a monthly basis.

For all current projects the RFQ and RFP Information Packages along with the RFQ and RFP have been compiled (as applicable). Additionally, Final Contract Documents for projects that have been awarded have been gathered. Further documentation will be provided to PM-Ds once the folders are set up letting them know that they need to work with Plan Coordination to update post-award submittals for their projects.

Final As-Built Plans will be posted in both the Falcon Archive Environment and the Plan File Room upon receipt (accessed via Falcon WebSuite).

1.6.3 Folder Structure for Design Build Projects

1.6.3.1 Folder Structure for Request for Quote (RFQ)



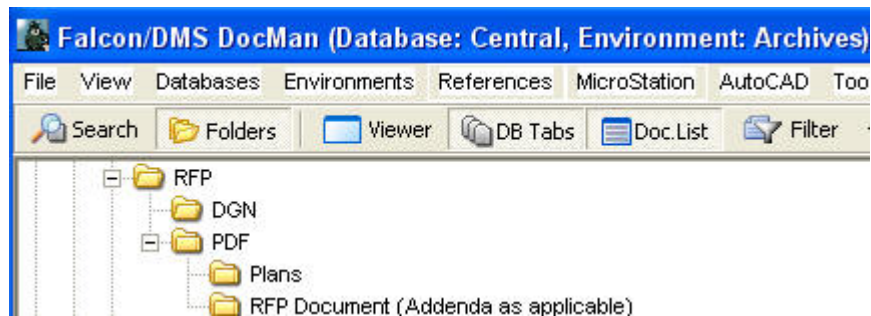
RFQ (Folder)

- DGN (Folder) See [Chapter 1, Section 1.7](#) for Division Designations.
 - bUPC
 - dUPC
 - hUPC
 - sUPC
 - tUPC
- PDF (Folder)
 - Plans (Including RFQ Information Subcomponents) (Folder)
 - Environmental (Folder)
 - Environmental Permit Documentation
 - Environmental Document
 - Wetland Compensation Manual
 - Water Quality Permit Manual
 - Geotechnical (Folder)
 - GDR
 - Additional Pavement Studies/Past Geotech. Investigations
 - Hydraulics (Folder)

- H&HA Report
- Hydraulics Calculation Files
- Structure and Bridge (Folder)
 - Bridge Concept Study
- Special Provisions (Folder)
 - Materials
 - Environmental
 - S&B
 - L&D
 - General
- Traffic Engineering (Folder)
 - Traffic Counts
 - Traffic Reports
- Right of Way (Folder)
 - Plats Showing ROW Limits
 - Displacee List
 - Relocation Assistance Report
 - Coal Assessment
- Utilities (Folder)
 - Contact Point Documentation
 - Additional Utilities Specific PDFs
- Other (Folder)
 - Public Hearing Information
 - Scoping Form
 - QA/QC Manual

- Previous Technical Proposals (for Re-solicitations)
- Documentation from other States
- Plans (PDF) (Folder)
 - Roadway
 - Structure and Bridge
- RFQ Document (Including Addenda) (Folder)
 - RFQ(Folder)
 - Addendum 1(Folder)
 - Addendum 2 (Folder)

1.6.3.2 Folder Structure for Request for Proposal (RFP)



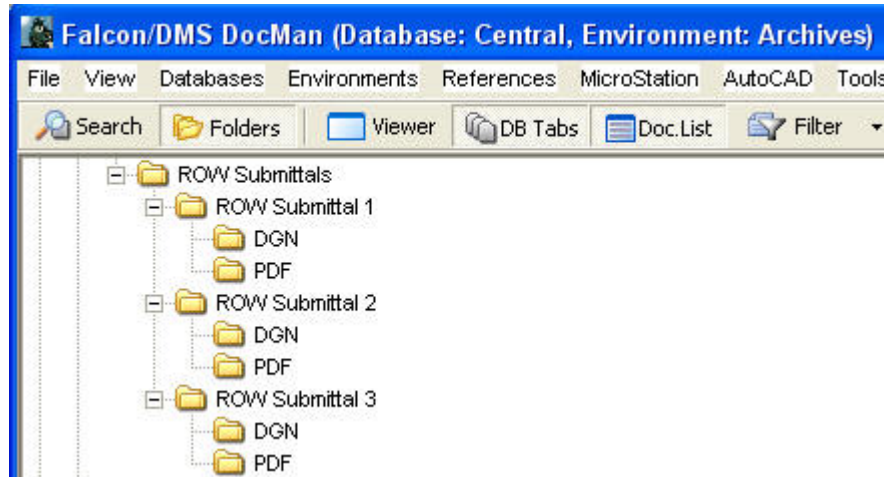
RFP (Folder)

- DGN (Folder)
 - bUPC (Folder)
 - dUPC (Folder)
 - hUPC (Folder)
 - sUPC (Folder)
 - tUPC (Folder)
- PDF (Folder)

- Plans (Including RFP Information Subcomponents)
 - Environmental (Folder)
 - Environmental Permit Documentation
 - Environmental Document
 - Wetland Compensation Manual
 - Water Quality Permit Manual
 - Geotechnical (Folder)
 - GDR
 - Additional Pavement Studies/Past Geotech. Investigations
 - Hydraulics (Folder)
 - H&HA Report
 - Hydraulics Calculation Files
 - Structure and Bridge (Folder)
 - Bridge Concept Study
 - Special Provisions (Folder)
 - Materials
 - Environmental
 - S&B
 - L&D
 - General
 - Traffic Engineering (Folder)
 - Traffic Counts
 - Traffic Reports
 - Right of Way (Folder)
 - Plats Showing ROW Limits

- Displacee List
- Relocation Assistance Report
- Coal Assessment
- Utilities (Folder)
 - Contact Point Documentation
 - Additional Utilities Specific PDFs
- Other (Folder)
 - Public Hearing Information
 - Scoping Form
 - QA/QC Manual
 - Previous Technical Proposals (for Re-solicitations)
 - Documentation from other States
- Plans (PDF) (Folder)
 - Roadway
 - Structure and Bridge
- RFQ Document (Including Addenda) (Folder)
 - RFP (Folder)
 - Addendum 1(Folder)
 - Addendum 2 (Folder)

1.6.3.3 Folder Structure for Right of Way Submittals (ROW/R/W)

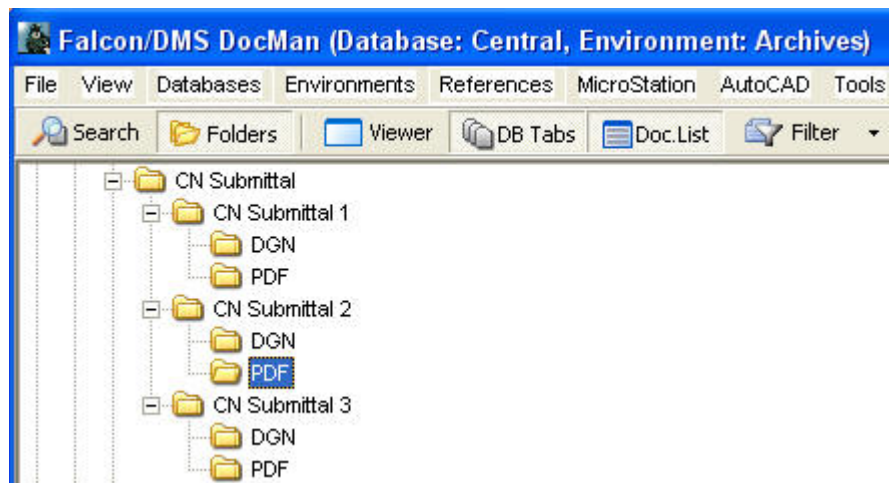


ROW SUBMITTALS (Folder)

- ROW SUBMITTAL 1 (Folder)
 - DGN (Folder)
 - bUPC (Folder)
 - dUPC (Folder)
 - hUPC (Folder)
 - sUPC (Folder)
 - tUPC (Folder)
 - PDF (Folder)
- ROW SUBMITTAL 2 (Folder)
 - DGN (Folder)
 - bUPC (Folder)
 - dUPC (Folder)

- hUPC (Folder)
- sUPC (Folder)
- tUPC (Folder)
- PDF (Folder)
- ROW SUBMITTAL 3 (Folder)
 - DGN
 - bUPC (Folder)
 - dUPC (Folder)
 - hUPC (Folder)
 - sUPC (Folder)
 - tUPC (Folder)
 - PDF (Folder)

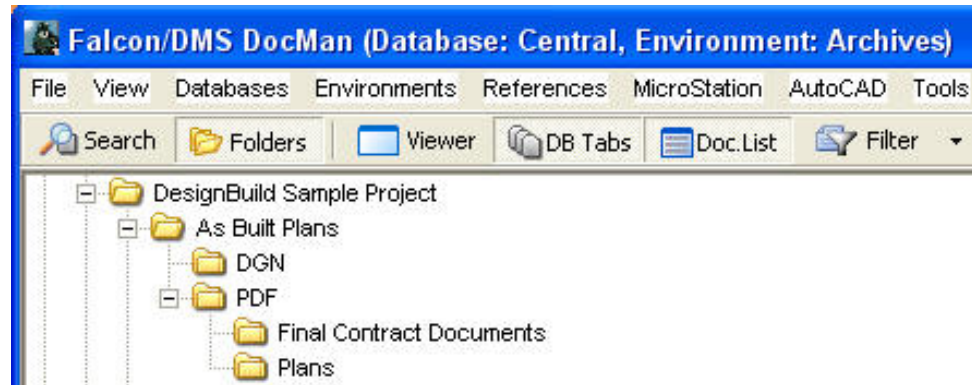
1.6.3.4 Folder Structure for Construction Phase Submittals (CN)



CN SUBMITTALS (Folder)

- CN SUBMITTAL 1(Folder)
 - DGN (Folder)
 - bUPC (Folder)
 - dUPC (Folder)
 - hUPC (Folder)
 - sUPC (Folder)
 - tUPC (Folder)
 - PDF (Folder)
- CN SUBMITTAL 2 (Folder)
 - DGN (Folder)
 - bUPC (Folder)
 - dUPC (Folder)
 - hUPC (Folder)
 - sUPC (Folder)
 - tUPC (Folder)
 - PDF (Folder)
- CN SUBMITTAL 3 (Folder)
 - DGN (Folder)
 - bUPC (Folder)
 - dUPC (Folder)
 - hUPC (Folder)
 - sUPC (Folder)
 - tUPC (Folder)
 - PDF (Folder)

1.6.3.5 Folder Structure for As-Built Plans



AS-BUILT PLANS (Folder)

- AS-BUILT PLANS (Folder)
- DGN (Folder)
 - bUPC (Folder)
 - dUPC (Folder)
 - hUPC (Folder)
 - sUPC (Folder)
 - tUPC (Folder)
- PDF (Folder)
 - Plans (Folder)
 - Final Contract Documents (Folder)

1.6.4 Summary Notes for Design Build Projects

** Continue numbering sequence for all subsequent ROW and CN submittals numerically until the final submittal is received.

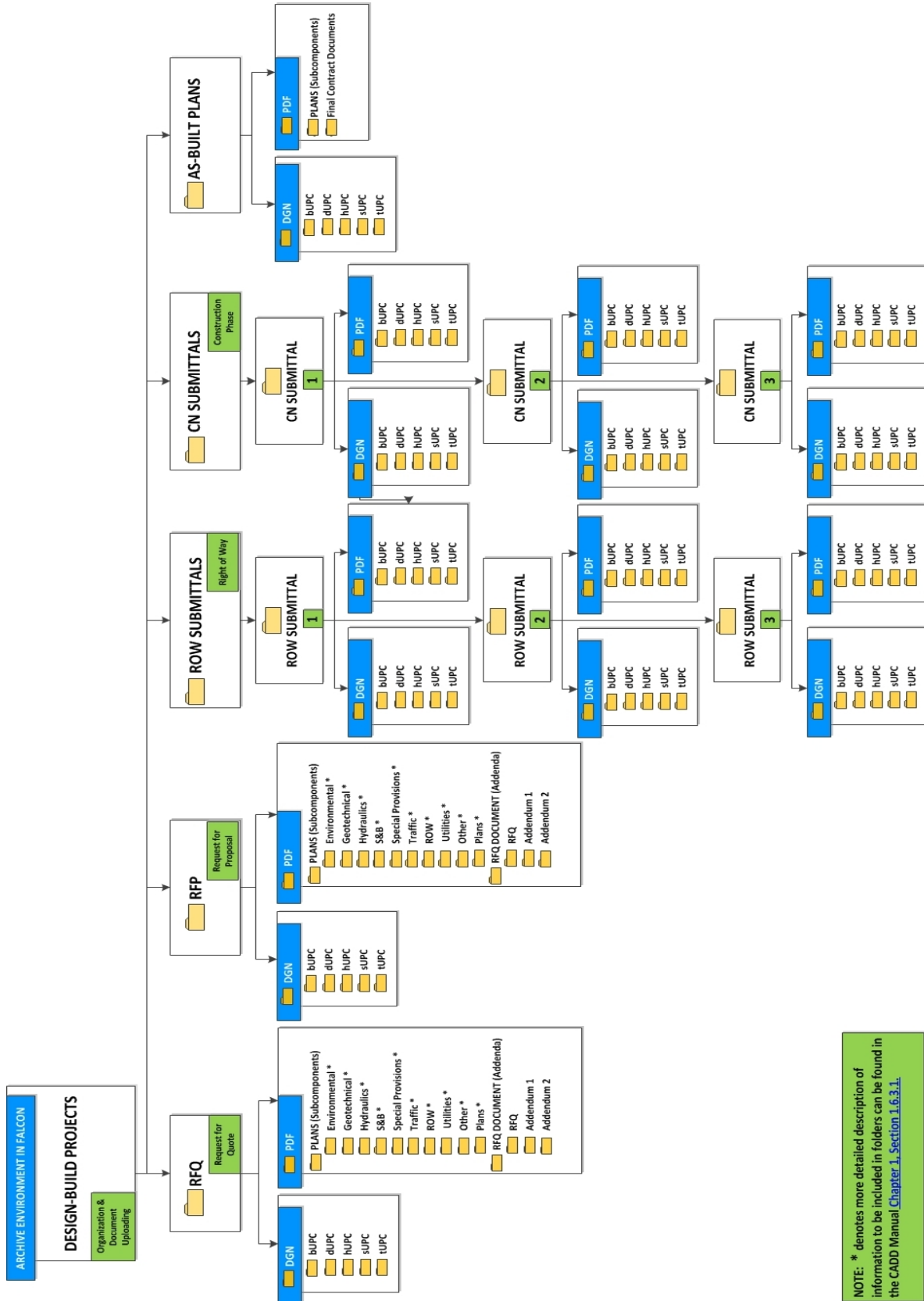
** RFQ/RFP Information package addenda should retain the same structure as the original (PDF and DGN separation – use consistent folder structure)

** Please ensure all documents are in PDF or DGN format – word and excel files need to be in PDF format prior to submittal for posting.

** Addenda to be added after release to folder structure (not included in actual RFQ/RFP Information Package)

** bUPC (b78750, b13528, etc.)

Table 1-4 Directory Structure for Design Build



NOTE: * denotes more detailed description of information to be included in folders can be found in the CADD Manual Chapter 1, Section 1.6.3.1.

1.7 Project Development

1.7.1 Required Files

The project development will consist of a series of master files and reference files. Following are examples of files used in developing a set of Right of Way and Construction Plans.

- **Survey File** (contains topography)
- **Survey Property Owner File** (contains property owner information)
- **Survey Utility File** (contains all existing utilities)
- **DTM File** (contains all digital terrain model data)
- **Master GEOPAK Design File** (contains proposed alignment, roadway items, etc.)
- **Utility File** (contains all proposed or relocated utilities)
- **Hydraulics File** (contains all proposed drainage)
- **ESC File** (contains erosion and sediment control items)
- **Sheet Files** (contains sheet border, project #, etc.)
- **Traffic Engineering Files** (contains pavement markings, lighting, signing, signals.)
- **Bridge Files** (contains bridge plans.)
- **Landscape Architectural Files** (contains trees, shrubs, grass, etc.)
- **Environmental Files** (contains soundwalls, wetland mitigation, stream restoration)
- Others as appropriate

All files should be placed in the appropriate directory or sub-directory to insure that they can be located by all divisions needing to reference the files. The directory path should be as follows: /documents/cfms_local/UPC#/* UPC #/FILE_NAME.EXT.

* Represents a letter for the division as follows:

Table 1-5. Division Designations

s - Survey	d - Design	b - Bridge	t - Traffic Engineering
h – Hydraulics (ESC)	e – Aquatic (Environmental)	n – Noise (Environmental)	l – Landscape (Location & Design)
r – Right of Way/ Utilities	c - Construction	g – Geotech (Materials)	u – In-plan Utility Relocation
su – Existing Utilities			

1.7.2 Sequencing of Files

The survey file should be referenced up to the master design file when designing the roadway. The survey and master design file will then be used as reference files for hydraulics.

Divisions other than Location and Design will create their own design files and reference up survey, design and hydraulics as appropriate to assist in the development of their plans.

The detailed development of the Right of Way and Construction Plans will be addressed in other chapters.

1.7.2.1 Projects under development

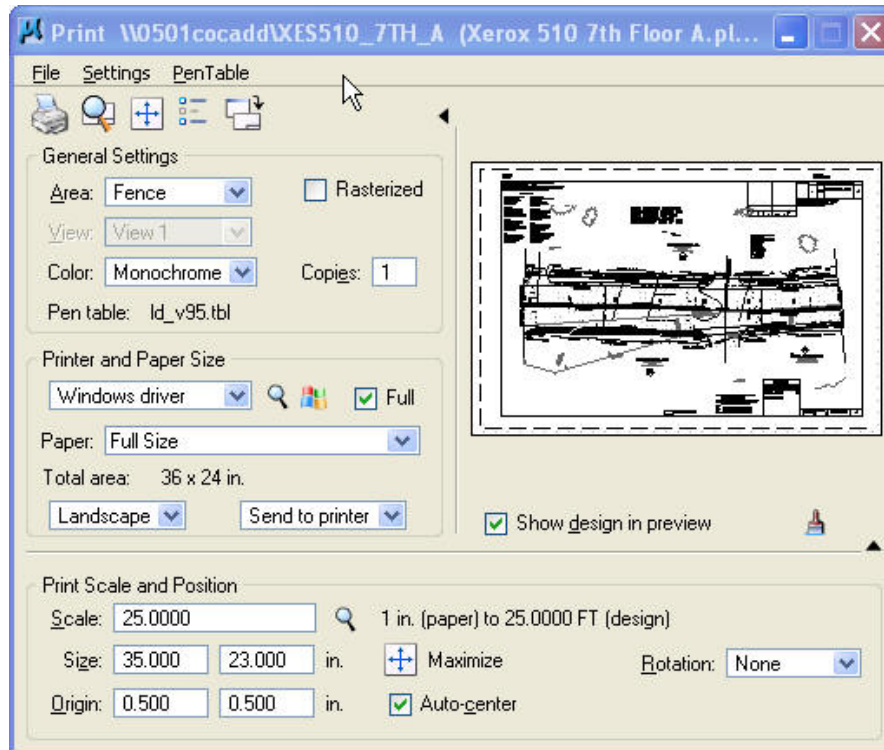
Note: Projects that are already under development may not have utilities, hydraulics, etc. as separate files. These will be accepted, however all new projects are to be developed using the above guidelines.

All electronic files are to be developed using the [standard layering scheme](#) as developed by VDOT and described in this manual. MicroStation has the capability of placing data on unlimited number of levels. These levels work similar to overlays, such that you can turn levels on and off to be able to display only the desired data instead of the entire file. A person can also plot only the desired levels to produce layered plans to assist the contractor in constructing the project. The level structure for each Division (section of plans) will be described in the appropriate chapters or appendices.

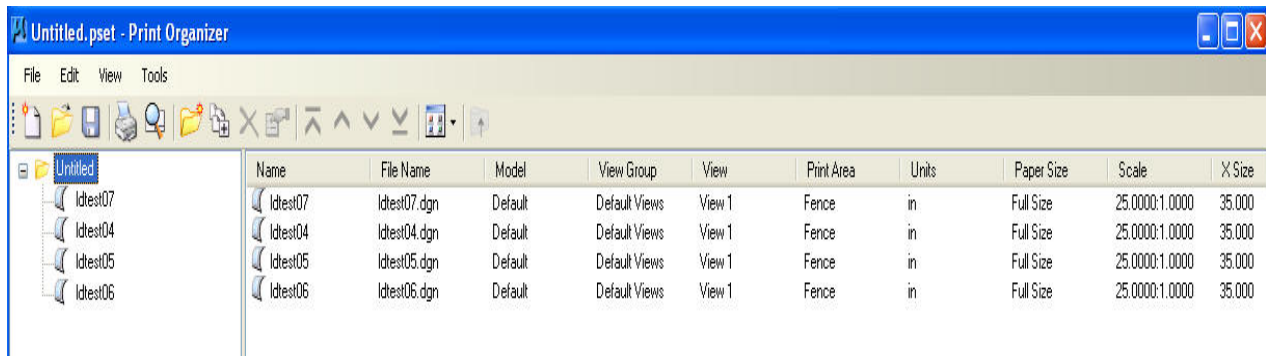
1.8 Plotting

1.8.1 Plotting Software

All of the plotting at VDOT (including PDFs) is done with **MicroStation print Menu** function. For more detailed instructions [see 3.11.1](#) plotting with MicroStation V8i.



Batch Plotting of a job is done sequentially using **Print Organizer** in MicroStation V8i. See [Batch Plotting](#) Chapter 3 for details. Some files may still be plotted or printed using Document Submit, if you still have the software on your PC.



1.8.1.1 Consultants

See [Chapter 7](#) Consultants and [Chapter 8](#) Electronic Deliverables