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Chapter 25 - APPENDIX

CADD Production Criteria Handbook

25.1 GLOSSARY OF TERMS

authentication The process of comparing the message digests (SHA-1 Hash Codes generated by the PEDDS application) of the Manifest file (Manifest.XML) and Signature files for an electronic delivery to those appearing on the signed Manifest Document (paper) or Signatory Documents (paper).

Authorization The event in which the project is certified as ready to be advertised for letting.

Bid Set A file set consisting of a data sub-set derived from the project data set (Project CD) containing only those files needed for advertisement and letting. Note that the files needed for this set remain in the folders where they were located in the project data set. All remaining empty discipline folders are deleted for the Bid Set. The SetMaker application is used to create the Bid Set from the project data set.

By-Level A term for Level Symbology.

CADD Computer Aided Design and Drafting.

cell A complex element composed of a group of other complex elements that is stored in a cell library for repeated replacement.

cell library A file that is used to store cells. To access cell in a cell library, the library must be attached.

Centerline The axis along the middle of a road or other facility from which features can be conveniently measured.

CES Cost Estimating System The Department's program for estimating construction cost for projects.

Change report An HTML report that is created by the Project 'Delta' application. It contains information about sheet-specific differences between a secured project data set and a revised project data set. It is a comparison between the indexes (ProjectIndex.XML) of an earlier delivery of a project, and a contemporary delivery of a project. Also see Revision Report. (See Section on Revisions in regards to file naming convention; however the name of the report is Deltandx#.htm, where # is the revision number.)

compliance certification worksheet A document that contains the data producers' certification that items required by the FDOT CADD Manual and this Handbook are included in the project.

composite PDF A single document which contains all plan sheet images in index order. This document must be in Adobe PDF format, reside in the project's root directory, and is named 'Project.pdf' for an original delivery. During the revision process, PDF files are created called Project#.pdf that contains the state of the plans at the time during a specific revision #. This revised PDF file is named 'ProjectRev#.PDF,' where # is the number of the revision.

In addition, a second PDF is produced for the courtesy of the contractor called Revision#.pdf which is a subset of Project#.pdf and only contains those sheets which were revised for the revision numbered #.

component A categorization of design plans as defined in Chapters 2 & 3 of the FDOT Plans Preparation Manual, Vol. 2.

- delivery** A set of electronic files secured by PEDDS, plus additional project metadata.
- delivery key** The message digest (SHA-1 hash code) used to reference the delivery. The delivery key is the hash code of the delivery's Manifest file.
- design file** MicroStation or AutoCAD document file. The open (active) design file can be manipulated. Design files can be attached to the open design file as reference files for viewing and construction purposes.
- DXF** A drawing interchange file format supported by most CAD packages. MicroStation design files can be saved in DXF format, and DXF files can be imported into MicroStation design files.
- electronic data indexer (EDI)** Electronic Delivery Indexer, or EDI, is used to build an index for a set of plans. EDI also helps develop the project Journals, and helps produce plotted image files of the plans sheets.
- extension** Characters optionally separated from the main part of a filename by a period (".") character. Traditionally, these have been used to designate the type of file. For example, .dgn, .cel, .ucm are commonly used to represent a design file, a cell library, and a user command, respectively.
- Font Library** A file in which text characters styles, symbols, or patterns are stored.
- global origin** Location of the origin of the Cartesian coordinate system in the design plane coordinates (UORs). When design plane positions are specified or reported in working units, they are relative to the global origin.
- hash code** See *Message Digest*.
- index** An XML file (ProjectIndex.XML) created by the EDI or Sheet Set Organizer (SSO) that contains metadata concerning all files that have been identified as sheets in a project directory. This file must reside at the root folder of the project.
- journal** Electronic Documentation that is included with a project, detailing the decisions made, methods used, and actions taken on the project.
- letting** The process of advertising, selection, and award of a contract for the construction of a project.
- letting CD** The compact disk prepared for the letting process consisting of plans, specifications, and a front-end "kiosk" application that offers easy access to bidding documents.
- level** Data in the design file is segregated into drawing levels. Levels are similar to transparent overlays that can be put together to form a complete drawing. A level can be turned on and off independently in different views.
- level symbology** View setting that, when turned on, causes all elements on a particular level to be displayed with the same element symbology.
- line style** Part of the symbology of an element: for example, whether a line is solid, continuous dashes, dots and dashes, and so on. In plotting, a line style is an index in the range 0 to 7 that designates a particular sequence of pen up/down pairs to be used when drawing or plotting a graphic element. Each element has its own line style.
- line weight** An index in the range 0 to 31 that designates the weight or thickness of the lines used to draw or plot a graphic element. Each element has its own line weight.
- manifest document** A signed paper document used to secure a Manifest file, and references the Signature files in a project delivery.
- manifest file** The XML file (Manifest.XML), used by PEDDS to define and secure the entire contents of a project delivery. This file resides in the project's _meta_info sub-folder. The Manifest file lists the projects' files by their relative URL and SHA-1 hash-codes.

- message digest** Often referred to as a hash code, an alphanumeric string that is generated by a one-way cryptographic hashing algorithm and is used by PEDDS to uniquely identify a file based upon its contents.
- master units** The largest units in common use in a design.
- PEDDS** The Professionals' Electronic Data Delivery System (PEDDS) is an application used to secure a project or sub-sets of files signed/sealed by a signatory.
- plans change** (*Plans Preparation Manual Chapter 20 definition*) Modification to a set of plans, after the Estimates department has changed the Control Group, but before the plans are sent to the FDOT Central Office.
- project** Projects are identified by the Department through the Financial Project Identification Number and related project identification information. Multiple deliveries can occur for a single project, each representing the status of the project at the time of delivery.
- project CD** Media (CD, DVD, etc.) containing all data associated with a project, including all files on the 'Plans & Specs' CD, all design files, all reference files, project journals, etc.
- project delta** An application used to track file changes after revisions and corrections. ProjectDelta reports any indexed differences between two deliveries of the same project. ProjectDelta creates the Revision Report (Deltandx#.htm) and Change Report, where # is the revision number (See Section on Revisions in regards to file naming convention.)
- project key** An alphanumeric character string (a Global Unique Identifier or GUID), generated at the time of project creation that uniquely identifies a project. This number is unique across all project deliveries of the same project. This number is printed on the Manifest report.
- project root directory** The file system directory that contains all project files and folders. The project root directory should not contain files that do not pertain to the project, nor should files that are part of the project reside outside of the project root directory or one of its sub-folders. The FDOT project folder structure is defined in chapter 5 of the CADD Production Criteria Handbook.
- qSheet** A printing application used to print all or part of an indexed project sheet set. qSheet uses the Project Index (ProjectIndex.XML) and Revision Reports (Deltandx#.htm) as input. (See Section on Revisions in regards to file naming convention.)
- quality control reports** Reports that must be included with the final project delivery, the Compliance Certification Worksheet and all reports listed therein.
- reference file** A design file that is attached to and viewed simultaneously with the active design file. Reference files can be used for constructions in the active design file, but cannot be modified. Elements can be copied from a reference file to a design file.
- resolution** The number of addressable points across a given area. For example, plotter resolution is measured in lines per inch, while screen resolution is usually given with two numbers indicating the number of pixels across the width and height of the largest image that can be displayed.
- revision** Section 20.4 of the Plans Preparation Manual defines a revision as a modification to the Bid Set after it has been transmitted to Central Office but prior to bid opening.
- revision report** An HTML report created by the 'ProjectDelta' application. It contains information about sheet-specific differences between a secured, delivered file set (Project CD) and a new, corrected file set. This report is named 'Deltandx#.htm', where # is the revision number, and is placed in the root folder of the project. This report is a comparison between the indexes (ProjectIndex.XML) of an earlier delivery of a project, and a contemporary delivery of a project. Also see Change Report.

- revision set** The set of files that denote changes from one delivery to the next, as well as the Revision Report (Deltandx#.htm) that helps define them. Because Revision Sets are managed as independent deliveries of the same project (and have their own unique Delivery Keys, but Same Project Key) unique signatories are created and used to sign those files for that revision.
- securing files** The act of updating the project's Manifest.XML file with the contemporary listing of project files and their SHA-1 hash codes, which in turn will allow PEDDS to validate secured files. This process produces the Manifest Document.
- seed file** A template used to create a new design file or cell library. The new file has its settings identical to those of the seed file.
- seed project** A seed project is a template folder structure that contains all folders as listed in Chapter 4 of the FDOT CADD Production Criteria Handbook, as well as other project configuration files.
- set maker** 'SetMaker' is an application to extract a project subset from a secure project delivery.
- SHA-1 hash standard** US Secure Hash Algorithm 1 (SHA-1) is a secure hash standard which produces a unique representation of a data file. The SHA-1 is called secure because it is computationally infeasible to find two different files (files with different content) which produce the same hash (SHA-1 hash code).
- sheet** Electronic Delivery applications recognize a sheet as a discreet image file representing a page in the plans that is listed in the project index. A sheet must belong to a plans component and also be found in a defined discipline sub-folder of the project.
- sheet index report** An HTML report which is derived from the project's Index (the 'ProjectIndex.XML' file). Like Project.pdf, the original delivery file name is Sheetndx.htm. The report file is named 'Sheetndx#.HTM', where # is the revision number, and must reside in the project's root folder.
- sheet navigator** The 'Sheet Navigator' is an application which runs inside MicroStation, allowing users to browse and open MicroStation files containing sheets for verification or editing. Its purpose is to 'tag' sheets with data that supports later Electronic Delivery Indexing and Plotting. It is a foundation utility for subsequent Electronic Delivery processes and should be run against every MicroStation design file in the project that has sheets, ensuring sheet data can be extracted properly.
- sheet set organizer** The 'Sheet Set Organizer' is an application which runs in conjunction with AutoCAD Sheet Set Manager. Its purpose is to update fields in the Sheet Set Manager database(s) with data that supports later Electronic Delivery Indexing and Plotting. It is a foundation utility for subsequent Electronic Delivery processes using AutoCAD Civil 3D and is run against every Sheet Set Manager database (*.DST) in the project, ensuring sheet data can be extracted properly.
- signatory** The person or professional who secures files in a delivery using a signature file and document. If the signatory is a professional, signatures will be governed by rules defined by the Florida Boards of Professional Regulation. A professional may have multiple signatories in a project as needed by the revision process. See 'Revision Set' for more details.
- signature document** A wet-ink signed or signed-and-sealed paper document used to secure a signatory file. Florida and Federal law accept the association of a wet-ink signature with an electronic document. The Florida Boards of Professional Regulation have adopted rules whereby certain regulated professionals can electronically sign and seal electronic documents. By signing the Signature Document, the Signatory is electronically signing all files listed in the signature file.

signatory file Defines / lists files a Signatory signs, or signs-and-seals. All signatory files are created by PEDDS and reside in the project's _meta_info sub-folder. The signatory file lists each file selected by relative URL in the project, the SHA-1 hash code, and any qualifiers the Signatory indicated for his/her signature.

signing Acts of securing a set of files under a signature file without the benefit of signing-and-sealing under Florida Boards of Professional Regulation rules. This implies that the Signatory is signing with a signature type intended to sign only, and not as a Professional of Record.

signing and sealing The act of securing a set of files based on the rules defined by the Florida Boards of Professional Regulation governing signing-and-sealing of electronic files. These rules provide for:

- a signature file that defines the type of professional that is signing and sealing (i.e., engineer, surveyor, geologist, landscape architect, etc.)
- the professional's name, license number, and scope of work for the signature
- the list of files selected — each file listed is defined by its relative URL to the project, the SHA-1 hash-code for each file, and any qualifiers the Signatory has indicated regarding the scope of responsibility, usability, or reliability for any of the files selected

Signing and Sealing can only be done by certain regulated professionals. Signing and Sealing a file adds file information to the Signatory's signatory file, and generates the signatory report. Signing and sealing is not complete until the professional wet-ink signs, dates, and seals the signatory report.

strung project Two or more projects let in the same contract. For electronic delivery, Bid Set CD subsets for those projects may be assembled into a directory structure representing the Strung Project. An application called 'Strung Project' is provided to help perform this function. Note that Project CD datasets (contrast with Bid Sets CD subsets) are never merged for stringing – only Bid Set subsets extracted from Project CD datasets.

sub consultant A consultant, separate from the primary consultant, who performs work for a project under the hire of a prime consultant.

sub delivery A delivery of files made by a sub consultant to a consultant, prime consultant or project manager.

Sub-project A project that is combined and let with other projects as part of a strung project. These are also referred as 'Lead' and 'Goes-with' projects. The 'Lead' sub-project is the first project in the strung project and all others are 'Goes-with' projects.

subset A set of files that is entirely derived from a secure Project CD. 'SetMaker' is an application used to create subsets from Project CD data sets.

surface A geometric construction that can partition space but cannot enclose a volume.

symbol A character placed from a MicroStation symbol font.

symbology See element symbology or level symbology.

text attributes The color, weight, font, height and width of text.

text element MicroStation places text in design files as a distinct type of element.

units of resolution (UORs) The distance between adjacent points in MicroStation's design plan. There are a very large number of fixed discrete positions or UORs along each coordinate axis that are defined as real world coordinates by master units and sub-units (collectively, working units). This process is similar to setting up a piece of graph paper to represent data of a particular range.

validation The comparison of SHA-1 hash codes recorded in the project's Manifest file against those hash codes calculated from the contemporary delivery. Contrast with Authentication, in which one manually compares the calculated results of validation with those hash codes on the printed Manifest Document. Validation tests to determine if the project file set was altered since the project was secured.

working area Size, in working units square, of design plane.

working resolution Number of positional units, or units of resolution, per sub-unit.

working units The real-world units that the design plane is configured to.

25.2 ABBREVIATIONS

The abbreviations are listed in the FDOT Design Standards STANDARD ABBREVIATIONS Index No.001 for contract plans production. This list is not inclusive. Other Department accepted abbreviations may be used when deemed more appropriate. Where special abbreviations are used a descriptive tabulation may be necessary in the plans.

<http://www.dot.state.fl.us/rddesign/DesignStandards/Standards.shtm>

25.3 REFERENCED DOCUMENTS

Plans Preparation Manual (Topic No. 625-000-007 Vol1 English) (Topic No. 625-000-008 Vol2)

This manual provides engineering criteria and guidelines to be used in the development of roadway designs and plans preparation for roads on the State Highway System.

Facilities Design Manual (Topic No. 625-020-016)

This document describes the Florida Department of Transportation (Department) guidelines and requirements for providing professional Architectural/Engineering (A/E) consulting services for building facility projects for the Department.

FDOT CADD Manual (Topic No. 625-050-001)

This manual provides guidance to engineers and technicians in Computer Aided Drafting and Design (CADD) techniques for the development of Contract CADD plans.

Design Standards (Topic No. 625-010-003)

These indexes provide standard drawings to support the various engineering obligations for designing, specifying, estimating, constructing, inspecting, testing, accepting, operating, maintaining and monitoring the roads on the State Highway System.

Structures Manual (Topic No. 625-020-018)

This document provides the structures personnel with guidelines for the development of uniform structural design and plans preparation.

Drainage Manual (Topic No. 625-040-002)

The Drainage Manual sets forth drainage design standards for the Florida Department of Transportation.

Utility Accommodation Manual (Topic No. 710-020-001)

This guide is to regulate the location, manner, installation and adjustment of utility facilities along, across or on any road under the jurisdiction of the Department of Transportation.