

Pinellas County Department of Public Works



CADD PROJECT ADMINISTRATION MANUAL

for
Land Survey and Civil Engineering

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1-1

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Chapter 1 -

Introduction

CADD Project Administration Manual

Chapter 1 - Introduction

PURPOSE

The CADD Project Administration Manual serves to provide professional services administrators, project managers, consultants, in-house designers, and others, a procedure which shall be incorporated by reference into scopes and other contract documents for services. It includes all of the in-house hardware, software and configuration requirements. It identifies the tools, techniques, applications, standards and procedures that are to be used to produce quality products in a timely manner.

ADOPTION OF STATE STATUTES

Chapter 61G-17 Florida Administrative Code, Chapter 472 Florida Statute, Section 20.23 (3) (a), Section 334.044 (2) and 334.048, Florida Statutes and the Development of Plans and Specifications

SCOPE

This manual establishes production standards, procedures and support required for engineering projects. It is to be used by all in-house personnel producing engineering projects. It is to be included in all contracts requiring engineering plans preparation. The CADD Project Administration Manual will affect all offices of Pinellas County Public Works and all consultants, contractors and others that utilize engineering CADD systems or engineering data produced by these systems. CADD standards for in-house information technology resources must be in compliance with Department policies, procedures and standards for information technology resources.

DEFINITIONS

Engineering Data - Those digital files that support or represent the intent of the engineering design, or the engineering analysis.

CADD - (Acronym for *Computer Aided Design and Drafting*) the systems, software and methods used to analyze, design and represent transportation facilities graphically. CADD facilitates the presentation of *Engineering Data*. *Electronic engineering data and CADD* comprises the department's *Engineering Technology*.

CADD Technical Support - The support of computer systems and software for engineering applications concerning their functionality and fitness for use. This includes: (a) countywide procurement of hardware, software and other applications, (b) software and systems development and integration, assessment, testing, (c) distribution, implementation and training. This is the highest level of support, and is typically an Capital Support Group function or is provided by the systems or software developer.

CADD Operational Support - The support of computer systems and software concerned with the usage and application of such by a particular engineering discipline for a specific engineering task. This is typically a discipline (Roadway Design, Structures, Surveying and Mapping, etc.) or Public Works function. This involves the development of procedures, user guides and handbooks for the application of these resources in their functional area for day-to-day operations.

CADD TAC - (Acronym for *Technical Advisory Committee*) A discipline-based group sanctioned by the Public Works Director of Engineering and consisting of Public Works representatives charged to meet and work on countywide technical issues dealing with CADD systems, procedures, testing, implementation and operations. Management selects the representation in the respective constituency.

CAPITAL SUPPORT MANAGER - The Capital Support Manager is responsible for providing an operational CADD environment for Public Works. This includes: (1) the CADD hardware, communications and associated operating systems and (2) the core CADD software products and related programs that support Roadway, Structures, Construction, Survey, and Right of Way.

ORGANIZATION

The Capital Support Division (CSD) with input from the Public Works divisions/departments will develop and maintain procedures and standards for the Department's CADD production and related activities. The CADD Project Administration Manual must be in compliance with County policies, procedures and standards for information technology resources. These procedures and standards will be organized into numbered chapters within the CADD Project Administration Manual.

At present, the following chapters are planned for incorporation in the manual:

- Chapter 1 **Introduction, CADD Project Administration Manual:** Describes and implements the CADD Project Administration Manual.
- Chapter 2 **Computer Systems:** Establishes the requirements for procurement, maintenance and support of CADD systems and services within the Department.
- Chapter 3 **Production Standards:** Defines the standards to be used in the production of County CADD projects.
- Chapter 4 **Production Procedures:** Establishes minimum requirements that shall be met for the production of County projects.
- Chapter 5 **Electronic Data Delivery:** Describes how electronic data is to be delivered, archived and made available to customers.

- Chapter 6 **Support:** Defines the support structure and services, including CADD training, within the Department. Also defines applications and tools supported by the CSD.
- Chapter 7 **Software Development and Distribution:** Defines how CADD software is developed, tested and distributed.
- Chapter 8 **Quality Assurance:** Describes how Quality Assurance Reviews are to be used to improve CADD processes and products.

As chapters, in whole or in part, are adopted in accordance with this procedure, they will be added to the manual.

Each chapter will contain a purpose, scope and, where applicable, authority and definitions. Discipline specific requirements will be included as subsections in *Chapters 3* and *4*. A section will be included at the end of each chapter to record the history of revisions for that chapter.

REFERENCES

Policy Statement - for the Public Works Information Systems Division

REVISIONS AND ADDITIONS

CADD Project Administration Manual holders are encouraged to submit comments and suggestions for improvements to the manual. The Suggestion and Comment sheet at the end of this chapter or on the Internet site listed on the sheet may be used to provide feedback.

This manual applies directly to two distinct functions, the support of CADD and the use of CADD in engineering. Although the majority of the proposed changes to the CADD Project Administration Manual originated from these functions, all proposed revisions and additions, either in draft or original form, should be reviewed by all CADD users and CADD support staff, or offices affected by the manual.

Chapter 1 is the only chapter subject to the Management Review Process. This chapter authorizes the development and implementation of the CADD Project Administration Manual. The remaining chapters will be developed and approved by the Capital Support Manager with input from: (a) the Director of Public Works Engineering Department, (b) offices within Public Works that may be affected, (c) the engineering community and (d) the construction division. The intent is to be able to make technical revisions to the manual in a timely manner. Substantive revisions that result in policy change will be coordinated with the Public Works Director of Geographic Services.

Final revisions and additions will be distributed to registered holders of the CADD Project Administration Manual. The registration page, in the front of the manual, must be submitted to the Public Works Capital Support Manager.

All revisions and updates will be coordinated with the Public Works Capital Support Manager prior to distribution to ensure conformance with and incorporation into the Department's Standard Operating System.

Support Of CADD

Public Works Capital Support Manager shall interface between the users and the CSD to facilitate input revisions and additions to the manual in the area of support. CADD support shall include procurement and installation of computer hardware and software, electronic data delivery, training and quality control. It shall be the Capital Support Manager's responsibility to ensure that all offices affected by this manual are informed.

Use of CADD in Engineering

Each engineering discipline utilizing CADD shall be represented by a TAC Member. Knowledgeable and proficient CADD users shall represent each Public Works division/department on the TAC. The purpose of this committee is, through interaction with the CSD and Public Works Capital Support Manager, to continually improve the CADD procedures, process, standards, and identify users' needs. End user input for revisions and additions to the CADD Project Administration Manual shall be processed through the TAC Members. The recommendations are to be forwarded to the Public Works Capital Support Manager.

DISTRIBUTION

This document is available in electronic form on the Department's Internet home page (<http://www.pinellascounty.org/publicworks>). A hard copy is available through the Support Services Section.

Copies may be purchased from:

The Department of Public Works
Pinellas County Government
440 Court Street
Clearwater, FL 33756

Telephone (727) 464-3251
FAX Number (727) 4464-4363

Contact the above office for price information. Authorized Department personnel may obtain the CADD Project Administration Manual from the above office at no charge upon providing appropriate cost center information.

TRAINING

Training issues and opportunities are identified within the applicable chapters.

FORMS

Forms required for use with this manual are identified at the end of each chapter.

**PINELLAS COUNTY DEPARTMENT OF PUBLIC WORKS
SUGGESTIONS AND COMMENTS
CADD Project Administration Manual**

DOCUMENT NAME: CADD Project Administration Manual

**NAME OF FIRM/
COUNTY DEPARTMENT:**

ADDRESS: _____

**NAME OF PERSON
RESPONSIBLE FOR
SUGGESTIONS OR
COMMENTS:** _____

TELEPHONE NO.: () _____ - _____
FAX NO.: () _____ - _____

**SUGGESTIONS OR
COMMENTS:** _____

(Comments or Suggestions may be attached as marked up copies of pages from the manual.
**Comments or Suggestions may be transmitted via Internet to the Department's Home
Page: <http://www.pinellascounty.org/publicworks>**

HARD COPY COMMENTS AND SUGGESTIONS SHOULD BE SENT TO:

**Department of Public Works
Capital Support Division
440 Court Street, 4th Floor
Clearwater, FL 33756**

Chapter 2 -

Computer Systems

CADD Project Administration Manual

Chapter 2 – Computer Systems

PURPOSE

This Chapter establishes the minimum requirements for procurement, maintenance and technical support of the County's Engineering/CADD hardware and software systems.

SCOPE

These requirements apply to all computer technology and services within the responsibility of the Capital Support Division.

DEFINITIONS

CADD Hardware: The workstations, file servers, tape drives, CD-ROM, CD-ROM servers, printers, plotters and all other computer equipment used in the County's production effort.

CADD Servers: A computer dedicated to the storage and management of County Engineering / CADD data or the execution of specific production tasks, such as plotting.

CADD Software: Any software procured and supported by CAPITAL SUPPORT MANAGER.

CADD Systems: All of the CADD hardware and CADD software that support the CADD production effort.

CADD Workstation: A computer running CADD software used for the development of CADD drawings and documents.

Distributed Computer System: Any multi-user computer system that can operate independent of the County's mainframe computer.

CSD: Capital Support Division.

Engineering Data Services: A function or functions within the Public Works for handling and re-distributing engineering and CADD data, including consolidation, packaging, archiving, and distribution of all data belonging to a project.

County CADD Software: The CADD software and resources produced or distributed and supported by CAPITAL SUPPORT MANAGER.

Project Collaboration: Buzzsaw.com is a web based online project collaboration and management solution during all phases of the project life cycle. This service is provided through our enterprise partner Autodesk.

REFERENCES

Public Works Information Technology Resource Standards and Pinellas County Purchasing Manual, Section 3, Methods of Source Selection

CADD PLANNING AND BUDGETING

The Capital Support Manager will annually review the status of the Pinellas County Public Works CADD program and if appropriate submit a budget issue to support the County's CADD production efforts. With involvement and direction from management, the budget issue shall address Pinellas County Public Works CADD procurement needs for equipment, equipment maintenance, or other issues of Pinellas County Public Works significance. The Capital Support Manager will solicit input from the Director of Geographic Services during formulation of the issue. The CADD budget issue will be prepared in accordance with the COUNTY budget preparation instructions and submitted as part of the Public Works budget package.

ASSET SELECTION / STANDARDS ADOPTION

The Capital Support Manager, with assistance from the CSD, shall test and evaluate computer hardware, software, and other components of the CADD system. Adoption of new versions of standard CADD products is subject to the hardware and software selection procedures.

Hardware

This section addresses the mechanism for modification of the County's CADD hardware standards in accordance with *Purchasing Manual and the Approved Department Operating Budget Manual* to insure consistency with current technology.

Procedure For Adoption As A Hardware Standard:

1. The Public Works CADD hardware standards are subject to modification. Public Works personnel may request consideration of new computer hardware by submitting a written request for evaluation, including justification, to the Pinellas County Public Works Capital Support Manager.
2. The Pinellas County Public Works Capital Support Manager will review the request for evaluation. If justification is sufficient to warrant further investigation, the Capital Support Manager will assign an evaluation team to conduct a comprehensive evaluation.
3. The evaluation team will investigate the proposed hardware, prepare specifications if warranted, and prepare a written report detailing their findings. The proposed hardware must be tested for compatibility with CADD software standards. The report will be produced in a format suitable for presentation of all tests and test results.

4. The Pinellas County Public Works Capital Support Manager will arrange a joint meeting with the Director of Geographic Services to review the written report. Consensus by the group is required for modification of the CADD hardware standards.
5. The Pinellas County Public Works Capital Support Manager will submit a written request to the Director of Geographic Services in accordance with the *Purchasing Manual and the Approved Department Operating Budget Manual* to effect changes to the configurations changes made to the PC Lease Program for CADD Workstations.

View the updated form at the following web site:

<http://pinellascounty.org/purchasing/default.htm> download and print the pdf file "PC LEASE - CAD FORM".

Software

Evaluation Process:

- (1) Requests for modification to the CADD Information Technology Resource Standards must be made through the Pinellas County Public Works Capital Support Manager.
- (2) Requests will be considered by the Pinellas County Public Works Capital Support Manager and the Director of Geographic Services and approved or referred to an evaluation team in Information Technology (IT) – Technology Development Center (TDC) for technical analysis.
- (3) The IT-TDC team will determine an appropriate analysis process and document the evaluation. The completed evaluation will be submitted in writing to the Pinellas County Public Works Capital Support Manager.
- (4) The Pinellas County Public Works Capital Support Manager will submit a written request to the Director of Geographic Services in accordance with *Purchasing Manual and the Approved Department Operating Budget Manual*, for changes to the CADD Information Technology Resource Standards.

WORKSTATION AND SERVER CONFIGURATION

CADD workstations and servers shall adhere to the minimum standards defined in this section.

Workstation

CSD and the Capital Support Manager, Purchasing, BCC Information Systems, and Information Technologies establish configuration of CADD workstations jointly through the Computer Hardware Focus Group. Members of these different departments make up the Computer Hardware Focus Group (Chaired by Purchasing). Equipment and software standards are defined in the *Pinellas County CADD Manual, Chapter 2 "Public Works CADD Software", 2-10 through 2-12.*

Server and Network

Configuration of equipment and software shall be in accordance with *Purchasing Manual, BCC Information Systems and Management Information Systems Manuals.*

DATA BACKUP AND RECOVERY

The data on all Public Works CADD servers shall be regularly backed up according to the schedules specified herein.

Bootable system media shall be produced and tested at the time of a change in system software and kept with both the on-site and off-site backups.

Server Daily Backup

The Capital Support Manager will ensure that all modified files on all CADD Servers are backed up at the close of each business day.

ENGINEERING / CADD DATA RETENTION

Engineering / CADD project data will be retained in accordance with the rules set forth in the manual "*State of Florida, General Records Schedule GS1, State and Local Government Records.*"

- (1) Media: The retention media used shall comply with the rules set for in the County's manual "*State of Florida, General Records Schedule GS1, State and Local Government Record.*"
- (2) Verification of Data Integrity: The integrity of the retention media shall be verifiable using tools and procedures conforming to the County's manual "*State of Florida, General Records Schedule GS1, State and Local Government Records,*" and *Management Information Systems Back-up Standards.*

SECURITY

Security on all engineering/CADD information technology resources shall adhere to *Computer Security, BCC Information Systems, and Management Information Systems Standards.*

INVENTORY

The Capital Support Manager shall maintain a system of accounting for all centralized CADD Lease Program purchases to be used in subsequent budgeting activities, maintenance agreements, and general CADD resource reporting.

Hardware

The receiver of all CADD hardware purchased by the Director of Geographic Services shall transmit the *Property Inventory Control Accounts/Fixed Assets Report* to the Property Custodian the same day that the property tags are issued.

The Property Custodian for Capital Support Manager shall coordinate with local Property Delegates in the transfer of purchased CADD equipment to the proper local cost center.

The Property Custodian in conjunction with the Capital Support Manager shall maintain a perpetual electronic inventory of all CADD equipment affixed with Pinellas County Public Works property decals, including:

- Pinellas County Public Works Asset Number
- Serial Number
- Description of Item
- Purchase Order Number
- Purchase Order Date
- Warranty Start Date
- Warranty Expiration Date
- Vendor / Supplier
- Manufacturer
- Model
- County
- City
- Building / Room Number
- Host Name (for workstations and servers)
- Status (Active or Replaced)
- Asset Number of Successor Hardware
- Date of Succession

Software

Capital Support Manager shall maintain a perpetual electronic inventory of all CADD software including:

- Serial / Registration / License Number
- Description of Item
- Vendor / Supplier
- Manufacturer

- Software Title
- Version
- Purchase Order Number
- Purchase Order Date
- License / Maintenance Start Date
- License / Maintenance Expiration Date
- Pinellas County Public Works Asset Number of Host Computer
- Status (Active or Replaced / Upgraded)
- Serial / Registration / License Number of Successor
- Date of Succession

FILE MANAGEMENT SYSTEM

A file management system compliant with the County's [*Management Information Standards*](#) shall be used for exchange of CADD Production data between servers and workstations.

PLOTTING SYSTEMS

Plotting systems compliant with the County's *Information Technology Resource Standard Vendors* shall be used for the production of hardcopy documents.

SCANNING SYSTEMS

Plotting systems compliant with the County's *Information Technology Resource Standard* shall be used for the scanning of hardcopy documents into electronic formats.

Chapter 3 -

Production Standards

CADD Project Administration Manual

Chapter 3 – Production Standards

PURPOSE

This chapter establishes the critical CADD requirements (Production Standards) used in the production of engineering projects for the County in compliance with the procedures of each professional discipline of the County. These professional disciplines include Land Surveying and Mapping, Right of Way Mapping, Environmental Management, Roadway Design, Structures Design, and Construction.

SCOPE

These Production Standards apply to all CADD projects produced by and for the County in addition to the criteria, standards and procedures of the various disciplines included in:

Pinellas County Government

- *General Records Schedule GSI State and Local Government Records Item #231, Electronic Records Software*
- *AutoCAD/LDT Tool Section - Pinellas County Procedure Manual*
- *CIP Computer File Format - Pinellas County Procedure Manual*
- *Public Works Procedure Manual*
- *Public Works Engineering Department – Design Project Guidelines and Checklist*

FDOT

- *Final Estimates Preparation and Documentation Manual (Topic 700-050-010)*
- *Location Survey Manual (Topic 550-030-100)*
- *Plans Preparation Manual (Topic 625-000-005 and 625-000-006)*
- *Plans Preparation Manual (Topic 625-000-007 and 625-000-008)*
- *Right of Way Mapping (Topic 550-030-015)*
- *Roadway & Traffic Design Standards (Topic 625-010-003)*
- *Structures Design Guidelines (Topic 625-020-150)*

- *Structures Detailing Manual (Topic 625-020-200)*
- *Structures Standard Drawings (Topic 625-020-300)*
- *Department of State, Chapter 1B - 26.003 (10) Selection of Electronic Records Storage Media*

DEFINITIONS

The following definitions relate to electronic generated project data and deliverables. For the definition of other common terms and acronyms used in this CADD Project Administration Manual, refer to *Chapter 1*.

CADD Manual: The Public Works compilation of the CADD information and instructions, tools and guidelines that support consistent and efficient development of electronic deliveries for projects.

CADD Production Standards: Established specific requirements to achieve a desired level of quality or outcome, which impacts current or future operations and user applications.

Document Plot File: An electronic file, AutoCAD (*.plt) Plot File, from which a hard copy of a project document is produced.

Future - Electronic Journal: Electronic file(s) that documents the history of the development, the correspondence and decisions made, the methodology used, and other descriptive information about the project. The Journal includes the complete index of all electronic files referenced or generated for the project which details the work contained, the applications and methods used, and other information that will give future users of the files insight about the project data. The Electronic Journal is of two types – the component or discipline specific journal and the overall or project journal applicable to the total project.

Electronic Project: All electronic files, reports, documents, databases, plot files and other electronic information representing a complete contract document package for a Public Works construction project.

Engineering Data: Those electronic files that represent the critical geometric and quantitative controls or other engineering calculations supporting the graphical representation of a project.

Graphics Design File: An electronic file that conforms to AutoCAD graphics format.

PEDDS: Acronym for Professionals' Electronic Data Delivery System. PEDDS is a computer program that generates a unique digital identification for each file in an

electronic data transmittal. PEDDS produces a report of the files authenticated, some of which may be certified by the signature and seal of a professional practitioner.

PEDDS Information: The electronic files and paper documents created by PEDDS to secure the delivery and sign / seal selected files.

Project Component: All electronic files that represent and support a delivery by a discipline as part of a project.

Project Component Directory: The data structure and organization of electronic files on storage media. This directory is the highest branch in a file directory structure that contains a delivery from a discipline. Engineering Document Management Folder Structure

Project Directory: The parent directory containing all project component directories and ancillary data.

Project Index File: A text (ASCII) file that lists and briefly describes each file contained in a computer-generated delivery. The Project Index file is part of the Electronic Journal.

Supporting CADD Files: Any files, including AutoCAD Template Files (such as fonts, line styles, color pen tables, block libraries, etc.) that are required to reproduce the drawing file.

PUBLIC WORKS INFORMATION TECHNOLOGY RESOURCE STANDARDS

The *Public Works Information Technology Resource Standards* includes the hardware and software standards used and supported by the Capital Support Division, (CSD). The Capital Support Manager of the County establishes and maintains the procedure requiring the definition of such standards.

Graphics Software

The approved and supported drafting software of the County is AutoCAD®. AutoCAD is a registered trademark of Autodesk, Inc. All engineering design graphics files shall be delivered in AutoCAD format.

Civil Engineering Software

The principal civil engineering software used and supported by the Public Works is AUTODESK LAND DESKTOP®. LAND DESKTOP is a registered trademark of Autodesk, Inc. Other approved survey / engineering software standards includes those listed in *Public Works Information Technology Resource Standards* issued by the Director of Geographic Services.

The County requires the creation and delivery to adhere to the standards and formats as specified herein.

PROJECT DIRECTORY STRUCTURE

All projects shall have a standard project directory structure. Data from each discipline shall be maintained as individual sub-directories under the project directory. The Public Works standard project directory is provided in the **Pinellas County CADD Standards Manual**.

CADD TEMPLATE FILES

All projects will utilize the standard supporting CADD template files distributed in the Public Works CADD software delivery. The version used shall be current with the version available at the time of project execution. Exceptions to the standard supporting CADD template files, or user customization, shall be approved by the Public Works Project Manager and shall be documented and delivered as part of the project.

FILE NAMING CONVENTIONS

Files shall be named in accordance with the naming conventions in the **Pinellas County CADD Standards Manual**.

DELIVERY COMPONENTS

All CADD projects delivered will have eight components:

- (1) Engineering Data files
- (2) Graphics design files
- (3) Digital Raster Image files generated with component (2)
- (4) Plot files generated from component (2)
- (5) Paper plots generated from component (4)
- (6) Electronic Journal
- (7) QC Reports
- (8) PEDDS information

Engineering Data

Public Works requires that all engineering data files used or produced in conjunction with a project be created and delivered in the native format of the system used to produce it, in addition to the standard formats required in this manual.

Survey Data

Pinellas County Capital Project Development will be represented using the Professional survey and mapping guidelines of the Pinellas County Division of Survey and Mapping. Public Works requires that all survey data files used or produced in conjunction with any Capital Improvement project be created using these standards. This Standard's has been prepared to facilitate the creation of an organized and consistent product with the highest degree of reliability and accuracy. Reliability of the survey and mapping data produced from this Standards is essential for the subsequent design and construction of the County's Capital Improvement Program. All related services identified in any agreement should be in conformance with this Guide and the following:

Chapter 61G-17 Florida Administrative Code
Chapter 472 Florida Statute

Conflicting language or opinions as to the interpretation of this document shall be addressed, in writing, to the County's Chief Land Surveyor.

The Public Works Division of Survey and Mapping standards elements are provided in the **Pinellas County CADD Standards Manual**.

Geometric Controls

Horizontal and Vertical

All surveys shall be referenced to the North American Vertical Datum of 1988 (Vertical) and the North American Datum of 1983/90 (Horizontal). The unit of measure shall be the United States Foot. Transformation to or from other projections will be accepted with review of methods by the Land Survey and Mapping Division.

Control Monumentation

Project control points shall be established at intervals not to exceed 600 ft. All points shall be inter-visible at surface level when occupied by conventional survey instruments. Control points shall be positioned near the sideline of existing right-of-way at random locations with the highest degree of probability of being protected from future destruction. All control points shall be of permanent material, stamped with the appropriate name of firm, LS/LB number. Control points shall be identified on the survey by a point number, elevation, ordinate (Y) value, and abscissa (X) value of the datums referenced. The control point shall be a point on tangent with the reference lines and points as described above. A minimum of four (4) points for each line and a minimum of two (2) lines for each control point shall be required to adequately reference each

control point. Control points shall be referenced by conventional methods with references shown on the survey drawing. References shall be in four (4) directions with at least two (2) reference points in each direction by bearing and distances shown. All control and reference points shall be detectable with magnetic location devices. A list of all project control points shall be provided on the survey by a separate sheet. Elevation benchmarks shall be established at locations beyond the limits of anticipated improvements. The interval between established benchmarks shall not exceed 1,100 ft., be comprised of durable material and located upon fixed objects.

Accuracy

All surveys shall be performed and displayed in accordance with the Florida Minimum Technical Standards (Chapter 61G-17, F.A.C.).

Boundary

Boundary surveys shall meet the Florida Minimum Technical Standards, as referenced herein. In all cases, the scope of services identified in the referenced agreement shall provide the location and/or legal description of sites requiring boundary surveys.

Files will be created representing the controlling geometrics of the project. These files will contain the points, curves, spirals, chains, alignments, profiles, cross-sections and other critical geometric data necessary for the construction of the project. These files will be in addition to the native format files referenced above.

These geometric control files will be developed and delivered as electronic files that are machine readable by the Public Works principle design systems. The file formats shall conform to the formats specified in The Guide for Professional Survey and Mapping Services formats found in the **Pinellas County CADD Standards Manual**.

Right-Of-Way

Right-of-Way surveys, when included in the referenced agreement, shall be performed in accordance with the geographical limits identified in the project scope. The surveyor shall survey and map all existing rights-of-way and easements adjacent to the project. In subdivided lands, the exterior block lines shall be recovered sufficient to map interior lot lines and/or property lines with the expressed symbols identified in the map standards. All recovered monumentation characteristics shall be identified. Calculated relationship to recovered monuments shall be noted. Measured right-of-way widths shall be referenced from a geographic reference line by station and offset.

The reference line shall be relative to a geographical database. In all cases, the reference line shall be the center of Right-of-Way or section line where possible. Parallel offset reference lines are suitable, however, geographic logic is required. The use of random lines without geographic logic is prohibited. All forms of existing right-of-way and easements must reference a recorded source document. Right-of-way not referenced shall be identified as undocumented right-of-

way/easements. All adjacent ownerships shall reference the Property Appraiser parcel number. It shall be the responsibility of the Surveyor to communicate to the County all property research needs. The County shall provide all research services to the Surveyor. All proposed easement and right-of-way lines shall be identified on the Right-of-Way survey. The appropriate line and text symbols shall be used as shown in this Guide. Ownership parcels, numbers and a summary shall be identified on the map. Area content and dimensional remainders shall be shown. The parent tract of all proposed acquisition parcels shall be mapped at suitable scale as a separate drawing if necessary. All Section and Quarter Section Corners shall be identified on the Right-of-Way survey map. All improvements constructed within the proposed rights-of-way/easements shall be shown on the survey.

The line type schedule as shown in **CADD Manual – Chapter 4, Linetypes** Section shall be used to delineate the boundaries of all proposed acquisition parcels and easements. County-owned land or easements shall be identified as such with the reference document source. To help minimize revisions, privately owned land would not show the owner name or the reference document source on the Right-of-Way survey sheets. A Parcel Summary sheet shall be included in the Right-of-Way survey. The following format shall be included:

- Parcel Number, beginning with Parcel 001
- Station (Lt. or Rt.)
- Grantor=s Name
- Parent Tract Sq. Ft.
- Owner OR/Page Number
- Acquisition OR/Page
- Acquisition Date
- Acquisition Sq. Ft.
- Purpose
- Signature Date of Legal Description/Sketch

Right-of-Way surveys shall be produced at the same scale as the construction plans, when known. Survey sheets shall be sequenced south to north or west to east from the beginning of the project to the end. Existing and proposed right-of-way/easement sidelines shall be identified by station and offset for all changes in direction, beginning and at the end of curves. The geographic reference line shall be the reference source for all Station and Offsets shown. The County shall perform periodic update property searches and will so direct the surveyor to record such changes upon the map of survey as a contingency compensation item.

Unless otherwise directed, all Right-of-Way surveys shall incorporate aerial image insertion of raster digital files. Each image shall be clear and of good visible quality, and contrast.

Topographic

All surface features within the limits of survey, shall be surveyed and mapped. The limits of survey shall be defined in the agreement scope of services with sufficiency. The surveyor shall recite the limits of survey in the Surveyor=s Report, in addition to other standard report items. All trees four (4) inches and larger in diameter, measured at chest height, shall be surveyed, identified by species, and mapped with an appropriate symbol. Surface elevations shall be

obtained with sufficient density to build an accurate terrain model. All feature lines such as top of banks; toe of slopes, road centerlines, edges and curbs shall be surveyed. Identification of surface conditions such as: asphalt, concrete, dirt/marl, grass or wetlands shall be shown. All topographic features shall have geographic relationships. The surveyor shall locate all visible utilities and fixed objects within the limits of survey. All locations shall be related to the expressed horizontal and vertical datums previously identified. All topographic survey features shall be surveyed in sufficient detail and densification interval for accurate display when interpolated such that only minor deviation is detected. All feature lines shall be displayed at an accuracy not to exceed plus or minus 5% of the map scale, 90% of the time. Topographic features extracted by image acquisition methods shall meet this requirement. In obscured areas, ground measurements will be required to supplement planimetric contours. The Surveyor shall create, through accepted software processes, a digital terrain model (DTM) of the limits of survey. The terrain model shall be compared with surface measurements at locations deemed appropriate by the Surveyor. Comparison locations shall be recited in the Surveyor=s Report. All subsurface utilities when specified in the referenced agreement shall be surveyed. Manholes, storm, sanitary and communication utilities shall be surveyed. All utility poles, anchors and guy backs shall be surveyed and mapped. Utility pole numbers shall be shown on the map. When specified in this agreement, all subsurface utilities shall be designated by detection devices and exposed by non-destruct excavation methods by the surveyor or agents of the Surveyor. The Surveyor shall locate and survey all surface utilities. The Surveyor shall indicate in the Surveyor=s Report, by revisions, date and other circumstances, the utility survey data. All utility survey and mapping functions, both surface and subsurface, shall clearly identify the type and owner of the utility surveyed. Unknown utility data shall be clearly shown on the survey. The location of subsurface and surface utility data shall be indicated on the topographic survey by station, offset and elevation to the top of each facility together with inside diameter, dimensions and other pertinent data to accurately portray the utility. Storm and sanitary sewer lines along with other subsurface utilities shall be displayed in a plan and profile view with a separate plot for each utility classification.

Subsurface Utilities

When specified above shall be located in accordance with the quality level specified. All quality levels specified shall be as defined in the U.S. Department of Transportation, Federal Highway Administration Publication No. FHWA-IF-00-014, Prepared by Purdue University in January 2000.

The definitions are as follows:

- Quality Level D (QL D): Information derived solely from existing records or verbal recollections.
- Quality Level C (QL C): Information obtained by surveying and plotting visible above-ground utility features and by using professional judgment in correlating this information to Quality Level D information
- Quality Level B (QL B): Information obtained through the application of appropriate surface geophysical methods to identify the existence and approximate horizontal position of subsurface utilities. “Quality level B” data are reproducible by surface geophysics at any point of their depiction. This information is surveyed to applicable tolerances and reduced onto plan documents.

- **Quality Level A (QL A):** Information obtained by the actual exposure (or verification of previously exposed and surveyed utilities) of subsurface utilities, using (typically) minimally intrusive excavation equipment to determine their precise horizontal and vertical positions, as well as their other utility attributes. This information is surveyed and reduced onto plan documents. Accuracy is typically set at 15mm vertical, and to applicable horizontal survey and mapping standards.

Hydrographic

All hydrographic surveys shall reference the name of the water body being surveyed. Tidal data shall be identified on the survey. Mean range, mean low and mean high water elevations shall be identified by official source data recited in the Surveyor=s Report. All hydrographic survey and mapping shall be referenced to the datums identified. All water depths shall be expressed from mean low water datum. Subsurface bottom features and terrain slopes shall be surveyed.

Bathymetric contours at one-foot interval shall be displayed. A horizontal grid at 100 ft. matrix shall be displayed and annotated by coordinate value. Channel centerlines may be expressed by a geographic reference line using station and range calculations. All aids to navigation within the survey limits shall be located and mapped. The approximate mean low water and mean high water elevation contours shall be mapped when identified in the scope of services. All docks, seawalls and marine poles shall be surveyed and mapped. Drainage discharge pipes shall be surveyed and mapped. All visible evidence of marine and/or land habitat shall be identified in the Surveyor=s Report.

When supplied to the Surveyor, all easements, right-of-way or other property interests shall be mapped for orientation purposes. Recording data source shall be identified.

Digital Orthographic Images

Digital orthographic imagery shall be comprised of a computer compatible raster image, analytically rectified to eliminate distortions. Digital images shall be geographically referenced to the North American Datum of 1983/90 for insertion into vector drawings. Raster and vector display shall create an accurate depiction of line, text and image as base data. The Surveyor shall coordinate with the Photogrammetrist the appropriate target control and logistics to insure accurate output results. Accuracy standards, as referenced herein, shall be met. Image data shall be produced for suitable map scale display. The date of image shall be indicated.

The County will provide aerial photographic services to the Surveyor by a separate aerial survey firm.

The Surveyor shall coordinate all activity with the County and the County=s aerial survey provider.

Computer Based Mapping Standards

All survey maps delivered to the County shall conform to the following:

Copies of all field notes containing clear reference to all horizontal and vertical control data used in the survey, sketch of all traverse and/or control lines, sketches of all topographic features showing the location of and relationship to all point numbers.

The survey shall contain a digital terrain model (DTM), and a surface model containing a minimum of one-foot contours, generated by software processes acceptable to the County Land Survey and Mapping Division.

A CD ROM disk(s) containing all project data in the most current version of Autodesk Land Development Desktop as supported by the Pinellas County Land Survey and Mapping Division. The original project directory tree as created by LDT, all subdirectories and files shall be included. A standard ASCII file, in comma-delimited format, containing all project data points, shall be included on the media disk. Each record shall contain the point number, north value, east value, elevation, and code for each data point. A note shall follow the code whenever additional clarification is required to describe the data point as shown in **CADD Manual, Chapter 3 – Land Survey and Mapping Division – ASCII File Format - Sample Format**.

The fields of the comma-delimited file shall contain data information in the following format:

- FIELD ONE --- Point Identifier Number
- FIELD TWO --- North Coordinate Value
- FIELD THREE --- East Coordinate Value
- FIELD FOUR --- Point Elevation
- FIELD FIVE --- Point Code Identifier
- FIELD SIX --- Clarification Note

Codes used in data points shall be in accordance with the codes.inf schedule file modified as indicated **under CADD Manual – Chapter 3, ASCII File Format - Sample Format** supplied by the County (on CD disk as file Code.inf). In the event a code deviation is required to correctly identify a data point, a note explaining the new code shall follow the data point in the ASCII file and be entered in the original field notebook. See example in the CADD Manual, Chapter 3 – Land Survey and Mapping Division, Points – Point Code Standards.

Code additions shall not exceed eight (8) characters.

All AutoCAD drawing files on CD ROM disk(s) shall be in the most current version of AutoCAD as supported by the Pinellas County Land Survey and Mapping Division. The drawing file shall only contain fonts, shapes, linetypes or other attributes included in the standard Autodesk, Inc., Land Desktop, unless prior approval has been obtained from the County, except those deviations shown on **CADD Manual, Chapter 4 – AutoCAD Standards - Linetypes** herein. All block references contained within the drawing file shall be included on the media disk.

Drawing files shall include the Pinellas County Land Survey and Mapping Division standard cover sheet as a separate drawing and modified to the project requirement. A separate drawing containing the surveyor's report, coordinate control points, abbreviations, alignment and information shall be provided. The Surveyor shall provide a separate drawing containing the complete survey layered as set forth in Section 7.14. The drawing shall contain saved views for plotting with a title block inserted in paper space. All Cad drawing files shall conform to the County Line Type Schedule as shown in CADD Manual, Chapter 4 – AutoCAD Standards - Linetypes.

All survey data shall be placed on an appropriate layer in the Cad drawing file using the Pinellas County Land Survey and Mapping Division standard symbols. Data point, symbols and figure layers shall be in compliance with the **Pinellas County CADD Manual, Chapter 3 – Land Survey and Mapping** – Data Points and Symbols Layers Designations Section, as defined by files **default.mdb** found in the following path: <project>\Cogo\DescKey

You can also import a **project.dsc** file, a previous version of a description key file from Softdesk 7 or Softdesk 8.

You can determine which layer a figure is drawn on by creating a prefix for a group of figure names. All figures with a specific prefix are placed on a specific layer. This information is stored in the **fig_pref.db** file in the data\survey\language folder of the project directory. The following file was created in Softdesk 7 or Softdesk 8 as **fig_pref.txt**. When a drawing is opened with LDT 3, the application will convert this file to the new file format shown above as **fig_pref.db**.

Plan Deliverables

Three sets of signed and sealed prints of the project survey and report, on 24 inch by 36 inch media, shall be provided by the Surveyor to the County's Chief Land Surveyor prior to submission to any other party

Legal Descriptions And Sketches

Descriptions defining land boundaries shall be signed and sealed by a professional Land Surveyor and provide a definitive identification of boundary lines. A sketch shall be included showing all information referenced in the description and shall state that such sketch and description is not a survey. An attempt shall be made to keep the description and sketch on the same sheet. When additional sheets are necessary, each sheet shall be enumerated so as to ensure the reader has all of the document sheets. The initial point in the description shall be referenced to a well-established survey corner of record. The point of commencement and point of beginning shall be labeled on the sketch. The total area described shall be calculated and rounded to the nearest square foot. All description title block information shall be filled in and only one date shall be shown. Sequential parcel numbers shall be used when multiple descriptions and sketches are required. The Surveyor shall insure complete agreement between the Right-of-Way Survey Map and Descriptions prepared.

Construction

Construction Reference Line

In all cases, the Surveyor shall be directed from the construction documents and specifications. The construction reference line, when requested, right-of-way sidelines and pond boundaries shall be staked at sufficient intervals to facilitate initial construction activities. Right-of-way sidelines shall be staked at even station intervals. All angle points and changes in directions of right-of-way and easements shall be staked and lathed. Lathes shall be clearly marked as

appropriate. All designed features shall be staked in a sequential process as requested by the Construction Contractor. The Surveyor shall coordinate staking requests with the Contractor and inspection personnel as required. All stakes, lathes and points set shall be clearly marked for easy identification. Field notes and diaries shall be maintained by the Surveyor and provided to the County Land Survey and Mapping Division at the conclusion of the project.

Quantity

All contract pay items of unit measure shall be surveyed and a report prepared by summary. The Land Survey and Mapping Division shall identify which pay items not to measure. The Surveyor shall measure all requested items relative to the construction plan database. All items shall be referenced to the construction reference line. Volumetric items may be determined through the use of terrain or surface models. Methods of measurement must be in conformance with the contract documents of the project.

As-Built

All as-built survey and mapping shall be relative to specific construction contract documents. A comparison between measured and plan shall be recited either in map or report form as specified in advance to the Surveyor. The Surveyor shall indicate the date of measurements in addition to other reporting requirements. All survey map and reports shall include significant data sources, control, datums, contract number and other matters deemed to be appropriate. Visual defects or alterations observed shall be measured and included on the map or report.

REPORT SUMMARY/FORMAT

The Surveyor Report shall be a text option on all maps of survey for all types of surveys or a separate document of letter (8-1/2" x 11") size. In all cases, the report shall include: Type of Survey, Date, Datums, Abbreviations legend, Accuracy Statements, Performance, Survey Methods, Data Source(s), Control Points, Parent Benchmarks, Project Benchmarks, Technician Name(s), Responsible Surveyor and Intended features. All reports shall be signed and sealed by the Surveyor. A minimum of three (3) copies (original signature and seal on each) shall be delivered to the County Land Survey and Mapping Division. Additionally, such report in letter size format shall be produced in the most current version of Word as supported by the Pinellas County Land Survey and Mapping Division and supplied to the County on acceptable disk media.

Quantity Data

The file formats shall conform to the formats specified in Public Works Standard Electronic Engineering Data formats found in the **Pinellas County CADD Standards Manual**.

Graphics Design Files

Graphics design files shall be prepared using the file naming conventions, symbology standards and software resources defined in the **Pinellas County CADD Standards Manual**.

Digital Raster Files

Digital Raster Image Files are used to produce the plots. The digital raster images are generated from Autodesk Raster Design (a.k.a. CAD Overlay), and produced to scale the associated world coordinate file in its respective format.

Plot Files

The sheet plots are document plot files and are used to produce the plots. The sheet plot files are generated from AutoCAD, and produced to scale.

Additional document plot files are produced for the backup/archive data.

Any engineering documents that are scanned into electronic format from paper shall comply with **General Records Schedule GS1 State and Local Government Records Manual**.

Paper Plots

The standards for paper plots are detailed in the **Pinellas County CADD Standards Manual**.

Electronic Journal

An electronic journal will be produced in accordance with the **Pinellas County CADD Standards Manual**. The electronic journal will be delivered with the project.

QC Reports

The producer of CADD files shall develop and follow a Quality Control Plan for CADD work. The producer shall also develop subsequent reports indicating their compliance with that Quality Control Plan. Compliance reports shall be produced in accordance with the **Pinellas County CADD Standards Manual** and will be delivered with the project. The use of AutoCAD and Land Desktop - CAD Standards extension to facilitate the quality control of all CADD deliverables. Guidelines and associated files will be provided by Pinellas County Public Works.

Future - PEDDS Information

All producers of electronic data for Public Works will use PEDDS to sign and seal such data in accordance with the Public Works Procedure Manual. Signed and sealed documents generated by PEDDS will accompany the prescribed media and be part of the delivery. PEDDS will also be used to secure the entire project directory for delivery.

CADD Standards MANUAL

The **Pinellas County CADD Standards Manual** is published on the County's Internet Web site at: <http://www.pinellascounty.org> and the County's Intranet Web site at: <http://intraweb.co.pinellas.fl.us>.

The **Pinellas County CADD Standards Manual** contains:

- Drawing standards for symbology, including required fonts, layers, colors, line-types, line-weights, and plot styles.
- References to supporting files, such as fonts and line-types, blocks, template files, color table files, databases, and configurations for COUNTY supported engineering software for Public Works.
- References to supporting files for Land Desktop, such as project structure, prototype projects, setup files, data elements, naming conventions for Alignments, Point Groups, Surface (DTM) Names, Label styles, Pipe Runs, Sheet Manager, etc...
- Electronic plans production and delivery specifics, such as directory structure requirements, file formats and file naming requirements
- References to supporting Autodesk applications and drafting aids
- References to documented help, operating instructions, handbooks and guidelines
- Information about other Public Works supplied CADD programs such as quality control software, PEDDS, Batch Plotting, etc.

Each professional discipline within Pinellas County may define additional CADD requirements.

Chapter 4 -

Production Procedures

CADD Project Administration Manual

Chapter 4 – Production Procedures

PURPOSE

This chapter provides the critical steps for a consistent and efficient CADD production process.

SCOPE

These procedures are applicable to the computer-based CADD applications utilized by and for Public Works in the production process. They are intended to complement and support the policies, procedures and standards for Public Works.

ACCOUNTABILITY

This procedure does not exempt the professional from performing responsible engineering, surveying and mapping, or architecture. The policies and procedures of the Public Works Department and appropriate professional practice take precedence when providing professional services for Public Works. The professional shall have final responsibility for the accuracy of all input and output of computer-based applications.

DEFINITIONS

CADD Production: The development of Electronic Projects utilizing computer-based applications, software and discipline processes.

Project Manager: The person charged with the responsibility for ensuring the scope of work for a project is satisfied. This could include discipline specific personnel. This person is responsible for receipt, acknowledgment, validation and acceptance of the project data.

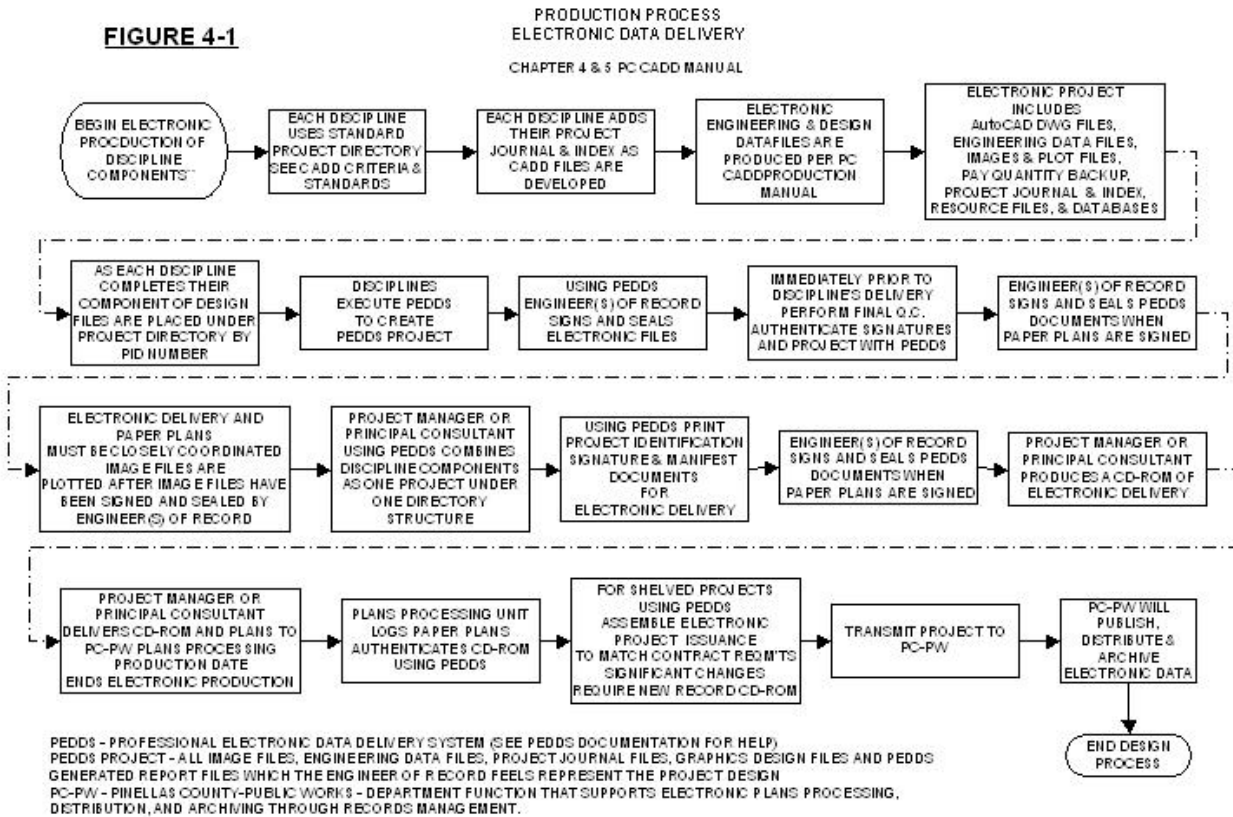
Standard Operating Instructions: Instructions for operating Public Works developed software and other core CADD packages intended to help guide the CADD user in CADD production activities.

PUBLIC WORKS CADD RESOURCES

In the interest of consistency and efficiency, Public Works has established the *Pinellas County CADD Standards Manual*, which is upgraded and made available periodically, along with Public Works CADD software and other resources to the entire Public Works CADD community and consultants. This *CADD Project Administration Manual (Chapter 3 & 5)* provides the standards that are critical to the production and delivery of quality electronic projects that satisfy both the immediate and future customers of CADD data. It is the user's responsibility to acquire the current version of Public Works CADD software and resources prior to beginning CADD production.

PRODUCING THE ELECTRONIC PROJECT

All electronic projects for Public Works shall be created recognizing the requirements as flowcharted in *Figure 4-1*



Standard Project Directory Structure

The Standard Project Directory Structure, as defined in the *Pinellas County CADD Standards Manual*, shall be used for all Public Works Electronic Projects. All files will be placed in their proper location in this directory structure as they are generated.

Future - Electronic Journal and Index

Each discipline working on CADD projects shall document the decisions made, methods used, and actions taken on the CADD project as they occur. This will be done in the form of electronic documentation, comprising the Journal for the project. Design variations and exceptions can be thoroughly documented as part of the Electronic Journal. The Professional of Record or Project Manager is responsible for the overall electronic journal for the project.

As a component of the Journal, every electronic file generated and included in the electronic delivery shall be indexed. This index will contain sufficient descriptive information so a successor or customer of the data will understand the file's contents and other data necessary to efficiently make use of the data. Index files shall be kept current during the production process.

The format of the project Journal and index file shall conform to the requirements in the *Pinellas County CADD Standards Manual*.

Plotting Content and Format

The visual (graphical) representation of electronic CADD data is critical for the proper communication of the professional's intent. Roadway, Structures Design, Right-of Way Mapping and other disciplines have standards for plans and maps, which establish the plotting content and format of CADD for files and hardcopy plots. Producers of electronic projects must refer to these procedures for this information.

Quality Control

Quality Control shall be performed as the work is being done. Every user must develop and / or follow a QC Plan during the development of electronic projects. Work shall be checked for compliance with the *Pinellas County CADD Project Administration Manual, Public Works Procedures Manual and other Public Works policies and procedures* before finalizing the electronic project files.

Quality Control software is available to those producing CADD products for Public Works. Reports generated by this software shall be included in the delivery. The Project Manager shall use these reports for QC purposes.

STANDARD OPERATING INSTRUCTIONS

Public Works has developed detailed *Public Works Procedures Manual* for the development of software and other core CADD packages.

The most current version of Public Works CADD software and *Public Works Procedures Manual* will be used, or the version authorized by the project manager.

FINALIZING & DELIVERING ELECTRONIC PROJECTS

Electronic projects must be properly packaged for delivery per *Chapter 5*. This function requires compiling and organizing the data, signing and sealing the project data, quality controls, packaging and delivery.

Compile and Organize the Data

The Project Manager or Principal Consultant is responsible for assembling the required delivery for Public Works according to this manual.

Sign and Seal the Electronic Project Data

Chapter 19.1 General, of the *FDOT Plans Preparation Manual* states that documents are signed and sealed under the appropriate Florida Statute or Rule. All electronic versions of said documents shall be signed and sealed using PEDDS.

Packaging the Delivery

When the data is selected for a delivery, it will be integrated under a single project directory structure. Any additional required signing, sealing, and securing of the project data will be done using PEDDS. This operation must be accomplished prior to delivery of the project data to Public Works.

The project manager or principal consultant is responsible for proper packaging of the electronic project data in accordance with this manual. All project collaboration data must be delivered under a single project directory structure in accordance with the Public Works Procedure Manual (see CIP Computer File Format, Section C).

Final Quality Control

The principal consultant or project manager, working with the various discipline professionals, will ensure the content, completeness, usability and proper packaging of all electronic files. All projects data (plans & electronic files, etc.) will not be accepted by Pinellas County Public Works and/or the Project Manager without an approved CADD Standards Monitoring Report.

The Final Project Delivery

The Principal Consultant or Project Manager will use the PEDDS program to print the appropriate documents and obtain the necessary signature and seal on these documents.

After all signing and sealing is complete, CD-ROM(s) shall be produced in accordance with the *Pinellas County CADD Project Administration Manual* and delivered to the Project Manager, along with other contract deliverables.

Chapter 5 -

Electronic Data Delivery

CADD Project Administration Manual

Chapter 5 – Electronic Data Delivery

PURPOSE

This Chapter identifies the minimum requirements and functions necessary for the delivery and disposition of electronic data.

SCOPE

This Chapter covers Public Works functions to receive, authenticate, integrate, package, and distribute electronic data.

DEFINITIONS

Archival Data Set: This is a data set of all the electronic data for a project as defined in *Chapter 3*

Contract Package: The electronic bid package

Autodesk Buzzsaw.com: The online project collaboration

Project Data Tracking System: Computer system(s) used by Public Works to track, locate, and produce a history and disposition of the electronic data for particular projects

RECEIPT AND ACCEPTANCE OF ELECTRONIC DATA

The Project Manager is responsible for ensuring that the terms of the scope of services have been met. This includes ensuring that the *Pinellas County CADD Project Administration Manual* and quality control procedures were followed during production of the electronic data.

Receipt Of Data

The Project Manager will receive electronic data under letter of transmittal. A record of the disposition of all transactions concerning electronic data will be entered into the Autodesk Buzzsaw.com online collaboration project data tracking system.

Acknowledgment

The project manager will provide a letter of transmittal to the consultant. This transmittal does not infer the electronic delivery is acceptable, or meets all of the conditions defined in this manual or other agreements.

Authentication

Upon receipt of the media, Public Works will run PEDDS referencing the signed and sealed documents provided with the delivery. The project manager will ensure that the delivered electronic data agrees with the signed and sealed documents by using the PEDDS authentication process.

Acceptance

The Project Manager ensures that the electronic delivery is checked for completeness and meets the terms, conditions and requirements outlined in this manual. Once the electronic delivery has been determined to be in compliance, a record of acceptance will be made and the data will be transmitted to the Information Systems Division of Public Works. If the electronic delivery is rejected, then the provider will be notified.

ENGINEERING DATA SERVICES

The Capital Support Division provides a function or functions within Public Works Department for handling and re-distributing engineering and CADD data, including consolidation, packaging, archiving, and distribution of all data belonging to a project.

Contract Packaging

The Capital Support Division will coordinate with the Director of Engineering and the Fiscal Manager regarding contract-packaging requirements for a delivery or a letting.

Archive And Security Of Data

The Capital Support Division will insure prescribed safeguards for the data have been met according to *Chapter 2* of this Manual. The archival package or data set includes all electronic data available for a project.

PUBLICATION AND DISTRIBUTION

The Capital Support Division is responsible for publication and distribution of electronic data in accordance with procedures or requests, including but not limited to publishing electronic data to different media, CD-ROM publication and Internet / Intranet posting.

Chapter 6 -

Support

CADD Project Administration Manual

Chapter 6 - Support

PURPOSE

This chapter establishes the primary components of the Engineering and CADD support structure, including the Public Works training component.

SCOPE

This procedure establishes the CADD-related support roles and responsibilities of the Capital Support Group (CSD), the Public Works CADD support function. It establishes the hierarchy of support from the peer level to the department level.

Public Works supports all CADD software and hardware used for in-house production. Consultant support is limited to Public Works developed software, interfaces, and configurations.

COMPONENTS OF CADD SUPPORT

The primary components of the engineering CADD support structure include:

Systems Support: Test, select, procure, and maintain a CADD hardware and software necessary to support the technology in a networked environment.

Operational Support: Develop, enhance, and support the software applications used by the engineering community to perform CADD production. This includes providing the discipline-specific tools to perform tasks more easily and efficiently.

Training: Provide current technical materials and education for both systems and operations to enhance and maintain skills.

HIERARCHY OF CADD SUPPORT

CADD support is handled at different levels in the CADD countywide support structure. Users will seek support at the lowest level before escalating a support request to the next level. The following will address how support is handled for each component.

Systems Support

The first level of systems support is the Public Works Capital Support Division at the Capital Support Manager level. Support responsibilities within Public Works are distributed according to the Public Works organizational structure. The Public Works Capital Support Manager is the primary liaison within the Capital Support Group for addressing CADD systems issues. Public Works CADD systems support activities include but are not limited to, the following:

- (1) Assist with identifying the users' CADD hardware and software needs

- (2) Distribute and setup CADD equipment and software
- (3) Manage the Public Works engineering CADD budget
- (4) Recommend CADD network needs and improvements
- (5) Provide day-to-day technical support of the computer hardware and software systems used in Public Works
- (6) Provide a help desk system for the CADD user to call and log their support calls

The second level of systems support is the Public Works Capital Support Division / Network Administrator from IT – TDC and BCCIS. The support responsibilities of the Network Administrator include:

- (1) Provide input for the IT – TDC and BCCIS with regards to CADD budget
- (2) Provide inventory management associated with the Public Works CADD hardware and software
- (3) Maintained Pinellas County / Network vendor contracts and maintenance services
- (4) Provide day-to-day technical support of the computer hardware systems non related to CADD used in Public Works
- (5) Manage Public Works vendor contracts and maintenance services for non related CADD systems

Operational Support

The first level of operational support is peer support within the individual disciplines.

The second level of operational support is provided through the Technical Advisory Committee (TAC) members form. They represent their division and discipline on task teams to communicate and resolve support issues of department wide interest.

The third level of operational support is the Public Works Capital Support Group (CSD) and support staff. The CADD support unit is responsible for the core CADD software products and the operational network server. They provide general operational support for many of the CADD applications.

The CSD is also responsible for Public Works application development, enhancements, and system updates. CSD will provide support assistance or will contract for required services as necessary. CSD will coordinate all support requests including those to CADD software vendors.

TRAINING

Each division/department is responsible for coordinating all CADD training within Public Works. Public Works Capital Support Manager will coordinate the departments CADD training program for Public Works personnel in accordance with internal policy. The Public Works Capital Support Manager is the primary liaison for coordinating any training, which may be provided to Public Works and its divisions.

The Public Works Capital Support Manager will coordinate training in the following areas:

- (1) Hardware and software setup, maintenance and support
- (2) Application software packages (i.e., CADD, Engineering, Surveying, Scientific software)
- (3) Development tools and applications
- (4) CADD production procedures

Chapter 7 -

Software Development and Distribution

CADD Project Administration Manual

Chapter 7 – Software Development and Distribution

PURPOSE

The purpose of this chapter is to define how CADD software is developed, tested and distributed.

SCOPE

This chapter applies to all CADD software products procured or developed to produce projects for Public Works. This procedure covers the steps used to develop, test, approve and distribute CADD software products supported by Public Works. Development of CADD software used to produce projects for Public Works is the responsibility of the Capital Support Division and other designated offices and the Public Works Information Systems Division.

DEFINITIONS

Alpha Testing: Initial testing of CADD software products or enhancements by the Public Works Capital Support Division and testing by the Capital Support Manager support staff outside of the development environment.

Beta Testing: Secondary testing of CADD software products performed in a production environment by end-users.

CADD Software: CADD products and applications used in the production of electronic CADD projects, including programs, documentation, and training aids.

DEVELOPMENT

Development encompasses new CADD software applications, enhancements to existing CADD software (added features), and the maintenance (bug fixes) of CADD software. Development is based upon need identification and may include the purchase of commercial software when appropriate. Public Works Capital Support Manager will approve the development or acquisition of any new CADD software for Public Works.

Needs Identification

CADD software needs are communicated to the CSD by user requests through the Technical Advisory Committee (TAC's) Members. Development requests are compiled by CSD, reviewed and prioritized by the appropriate TAC Member(s), and a recommendation is made to the CSD for further action. If development or acquisition is approved, the TAC Member(s) will work with CSD to further identify requirements.

Specifications

CADD software development or acquisition will be based on written specifications and approved by the CSD.

Development Or Acquisition

The CSD, with input from the TAC Member(s) and the Capital Support Manager, will decide whether to develop CADD software in-house, contract for development services, or purchase a CADD software commodity. The CSD will keep the user community informed as to the status (including training and implementation schedules) of major CADD development projects within Public Works.

SOFTWARE TESTING

CSD, or the designated office, performs alpha testing of CADD software products during software development as required. Beta testing is to be performed prior to the general release of CADD software.

Beta Testing

When alpha testing demonstrates CADD software to be in good working order for the features intended for the release version, the software will be beta tested by production users prior to release. There are several activities involved in the beta testing cycle. The Public Works Capital Support Manager will facilitate these activities.

The beta testing of CADD software products for production by any of the Public Works disciplines will only be initialized following review and approval by the Capital Support Manager. Steps defined in this procedure for beta testing may not begin until such approval has been granted.

Public Works Capital Support Manager

(1) Alpha testing

The Capital Support Manager will participate in all alpha testing of the CADD software. The Capital Support Manager will participate in discussions and review of alpha test results with the Capital Support Managers' Support Staff and other support staff members to determine the readiness of the product for beta testing.

(2) Seeking approval to proceed with beta testing

The Capital Support Manager will seek approval of all beta testing from the Director of Geographic Services.

(3) Coordinating the production of preliminary documentation

The Capital Support Manager will make available any necessary documentation required to support the beta testing.

(4) Coordinating the identification of the beta testers

The Capital Support Manager will solicit testers from Public Works. The appropriate TAC Member(s) will review and make recommendations to the Capital Support Manager. The Capital Support Manager and staff will finalize, publish and maintain a list of TAC members involved in this program.

(5) Beta Testing Orientation / Training

If necessary, the Capital Support Manager will host an orientation / training session for the TAC Member(s) to acquaint them with the software and other issues relevant to the testing process, such as reporting test results, software updates, and additional training that may be required.

(6) Testing Process and Reporting

The Capital Support Manager will work with the TAC Member(s) and members of the development staff to define the testing process and the reporting method.

(7) Notification and Distribution to TAC Member(s)

The Capital Support Manager notifies TAC Members that materials are ready for distribution.

(8) Beta Software Updates

The Capital Support Manager will make the latest version of the testing materials available to the TAC Member(s). The Capital Support Manager will prepare a cover letter that contains a summary of the changes. The TAC Member(s) will provide written notification to the Capital Support Manager that materials were received.

(9) User Documentation

The Capital Support Manager will ensure that user documentation is prepared in accordance with the functionality of the software. Review of documentation will be done as part of the beta testing process.

(10) Final Beta Test Report

The Capital Support Manager will compile the results into a report and make it available to the TAC Member(s) and Director of Geographic Services.

TAC REVIEW AND RECOMMENDATION

New software or changes to existing software will not be placed in production until the TAC Member(s) have reviewed the final beta test report and recommended the software for

distribution. The TAC Member(s) will make a written recommendation to the Capital Support Manager for release of the product.

CADD PRODUCT APPROVAL

Approval to distribute CADD products comes from the Capital Support Manager via memo. This memo approves the software for general distribution to production users, and represents the final step in the development process.

CADD PRODUCT DISTRIBUTION

If approved, the TAC Member(s) may make recommendations concerning the method of user distribution to be employed for a CADD product. Consideration of such distribution requests will be made to the Capital Support Manager to determine the best method for software distribution.

All CADD product distribution will be done as follows:

- (1) Distribution will be made available to the TAC Member(s) who will be responsible for division/department distribution.
- (2) Written notice will be made to the Capital Support Manager under signature from the division/department TAC representative.
- (3) The written notice will contain a place for the Capital Support Manager to sign, acknowledging receipt of installation of the software. The Capital Support Manager will file the original for historical purposes, for future distributions.

Chapter 8 -

Quality Assurance

CADD Project Administration Manual

Chapter 8 – Quality Assurance

PURPOSE

This procedure establishes the basis for Quality Assurance (QA) monitoring in the Public Works CADD functions. It also provides the areas of responsibility, frequency of monitoring and reporting methods.

The objective of QA is the continual improvement of the CADD process, which provides both user and customer satisfaction.

AUTHORITY

The Director of Public Works, J. Keith Wicks, P.E, approves all quality assurance, policies and procedures.

SCOPE

Each division/department function has the responsibility of monitoring the implementation of policies, procedures and standards established for their particular processes. The CADD Project Administration Manual procedures and required standards apply to all CADD functions and will be monitored in accordance with these procedures by the Public Works Information Systems Division.

DEFINITIONS

Quality Assurance (QA): The planned, coordinated and continued activities performed to measure processes against predetermined critical requirements.

Quality Control (QC): The planned, integrated activities performed during work processes to ensure completeness, accuracy, proper decision-making, and conformance with all other valid requirements.

Monitoring Plan: A QA work plan for CADD developed with Public Works input that identifies what, where, when and how monitoring, reporting, tracking and follow up are to be performed.

Critical Area: Those steps in the CADD process where significant problems may be introduced unless the Production Criteria and Standards are followed.

Critical Requirement: A decision, standard or process operation that will substantially and negatively affect the quality of the product or results if omitted or not performed to the expected level.

Compliance Indicator: Evidence that the critical requirements that are being applied are producing the desired result.

QA MONITORING PLAN

The Public Works Capital Support Group monitoring plan identifies the critical areas of CADD to be monitored, critical requirements and the criteria to measure process compliance. Compliance indicators will be used by the Public Works Capital Support Division to determine how well the process is performing.

The monitoring plan provides the method for monitoring CADD processes, the frequency of team visits, the method for reporting and sharing monitored results with the division managers, and the method for tracking and eliminating non-compliance issues.

The plan covers the major production areas of CADD, but users are reminded that quality CADD production is the result of doing many individual computer based activities correctly and in accordance with the current criteria and standards.

CAD Standards Extension Monitoring Tool

The Capital Support Manager (ESC) and TAC Member will be required to administer CADD standards in every division/department, including outside Engineering Consultants to ensure compliance for all CADD deliverables of Pinellas County Public Works.

1. The Autodesk - CAD Standards Extension performs three tasks:
2. It associates CAD standards (DWS files) with AutoCAD drawings.
3. It allows you to find and resolve standards discrepancies during an interactive audit of a drawing file.
4. It performs batch audits of multiple files, with reporting capabilities

The CAD Standards Extension takes you through a file, giving visual feedback on standards discrepancies and suggesting appropriate fixes. You can correct problems on the fly. When you use it in batch mode, it produces a report listing variances.

Currently, CAD Standards Extension checks for violations in the following areas: Dimension Styles, Layers, Line Types, and Text Styles.

All drawing data found in violation of the Public Works CADD Project Administration Manual and CADD Standards Manual will be rejected, until all violations have been corrected. A compliant CADD report will be produced upon final delivery of the completed project data.

The CAD Standards Extension will be used as a tool to ensure the Quality Assurance of all deliverables throughout Public Works divisions/departments and with outside engineering Consultants.

The CAD Standards Extension will result in better-coordinated teams, a more effective design process, and a higher return-on-investment as an internal design tool.

ACCOUNTABILITY

The Public Works Capital Support Group issues the CADD Project Administrative Manual and CADD Manual, including application software with operating instructions so that all CADD production will be based on predetermined requirements. Input on all of these requirements is solicited from the user communities, especially from the Technical Advisory Committee within each of the production disciplines.

Public Works division/department members shall follow the discipline specific procedures for preparing plans and maps, and the CADD Manual procedures and standards in the preparation of all projects and associated documents. This includes the CADD Manual and the appropriate operating instructions contained in the Public Works CADD software delivery. Each division/department shall establish quality compliance indicators for all projects and monitor performance and compliance using those indicators.

Consultants are agents of Public Works and are responsible for the quality of projects they prepare. They shall comply with Public Works CADD requirements, and will perform quality control activities to ensure the completeness and accuracy of services performed for Public Works.

QA REVIEWS

A CADD Quality Assurance review will be conducted in each division/department a minimum of once a year. The Public Works Capital Support Division will coordinate these reviews with the Public Works Director of Geographic Services, Public Works Director of Engineering and Public Works Director. These reviews will be for the purpose of measuring compliance with the critical requirements as outlined in the annual CADD Quality Assurance Monitoring Plan.