

# California High-Speed Train Project



## TECHNICAL MEMORANDUM

### CADD GUIDELINES

#### TM 1.1.5

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0	13 Apr 07	Initial Release
1	10 Oct 08	Revised for Preliminary Design
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## System Level Technical and Integration Reviews

The purpose of the review is to ensure:

- Technical consistency and appropriateness
- Check for integration issues and conflicts

System level reviews are required for all technical memorandums. Technical Leads for each subsystem are responsible for completing the reviews in a timely manner and identifying appropriate senior staff to perform the review. Exemption to the system level technical and integration review by any subsystem must be approved by the Engineering Manager.

System Level Technical Reviews by Subsystem:

Systems: NOT REQUIRED \_\_\_\_\_  
Print Name: \_\_\_\_\_ Date \_\_\_\_\_

Infrastructure: NOT REQUIRED \_\_\_\_\_  
Print Name: \_\_\_\_\_ Date \_\_\_\_\_

Operations: NOT REQUIRED \_\_\_\_\_  
Print Name: \_\_\_\_\_ Date \_\_\_\_\_

Maintenance: NOT REQUIRED \_\_\_\_\_  
Print Name: \_\_\_\_\_ Date \_\_\_\_\_

Rolling Stock: NOT REQUIRED \_\_\_\_\_  
Print Name: \_\_\_\_\_ Date \_\_\_\_\_

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## ABSTRACT

This document presents guidelines for the development of Computer Aided Design and Drafting (CADD) drawings for the preliminary design of the California High Speed Train Project (CHSTP). These guidelines are intended for use by designers in advancing the design of the high-speed train system using uniform drawing parameters that promote quality and consistency across the project's disciplines and geographic regions.

This CADD Guidelines document is intended to provide the basic CADD parameters required to develop design drawings for the high-speed rail alignment, facilities, and systems. The document includes guidance on the following parameters:

- Drawings Standards
  - Drawing preparation
  - Drawing format and border
  - Working units
  - Drawing data levels
- Software Platforms
- File Management
  - Drawing file naming convention
  - Directory structure
- File Types
  - Seed files
  - Master files
  - Working files
  - Sheet files
  - Resource files

Guidelines for the development and maintenance of electronic files and information are also included in this document. Concurrent with the release of this guidelines document, drawing files containing the CHSTP drawing border will be made available for use by designers in preparing project drawings.

## 1.0 INTRODUCTION

### 1.1 PURPOSE OF GUIDELINES DOCUMENT

The purpose of this guidelines document is to establish uniform policies and procedures for the design, drafting, and management of electronic files and information for the California High Speed Train Project (CHSTP) drawing delivery process. These guidelines will be issued for use by the designers in advancing the preliminary design using uniform CADD drawing parameters that promote drawing quality and consistency across the project's design disciplines and geographic regions.

This manual presents the methods and standards that are to be used to develop project CADD drawings for the design for the CHSTP.

This CADD Guidelines document is intended to provide the basic CADD parameters required to advance the design of the alignment for the overall corridor. It is anticipated that this initial release will be expanded, revised as required and re-issued as the development of the project progresses and as software and drawing standards are updated.

### 1.2 APPROACH

The CHSTP project will utilize the MicroStation V8 software platform and generally follow the current California Department of Transportation (Caltrans) CADD Users Manual and associated CADD standards. These standards will be supplemented, augmented, and superseded as necessary to accommodate the requirements of CHSTP. If a required CADD standard is not specified by Caltrans, the CHSTP Program Management Team (PMT) will provide the standard to be followed for the project.

Note that the Caltrans CADD Users Manual is currently being updated to document changes from Metric to English CADD Standards. These changes reflect the current Caltrans development and delivery process for projects being developed in U.S. Customary Units (English) and MicroStation. The update to the Caltrans CADD manual is being completed incrementally and will only be available on the Caltrans Internet pages. As sections are completed, they will be dated and posted to the website. When previously updated sections require corrections or additions, there will be a new date and a link to the Errata document. When all the sections of the manual are finished, the CADD Users Manual will be printed and available at the Caltrans Publications Distribution Unit.

<http://www.dot.ca.gov/hq/oppd/cadd/usta/ppman/toc.htm>

### 1.3 GENERAL INFORMATION

#### 1.3.1 Definition of Terms

The following technical terms and acronyms are used in this document and have specific connotations with regard to the CHSTP.

<u>Seed files</u>	A CADD template file that contains settings such as the project global origin and working units and does not contain design elements.
<u>Resolution</u>	The 'worst-case' accuracy for the design environment that occurs at the very outer limits of the working area/plane/volume.

#### Acronyms

CADD	Computer Aided Design and Drafting
CCS	California Coordinate System
Caltrans	California Department of Transportation
CHSTP	California High-Speed Train Project
DGN	MicroStation V8 design file
NIST	National Institute of Standards and Technology
PDF	Portable Document Format
PMT	Program Management Team

### 1.3.2 Units

The California High-Speed Train Project is based on U.S. Customary Units consistent with guidelines prepared by the California Department of Transportation and defined by the National Institute of Standards and Technology (NIST). U.S. Customary Units are officially used in the United States, and are also known in the US as “English” or “Imperial” units. In order to avoid confusion, all formal references to units of measure should be made in terms of U.S. Customary Units.

## 2.0 CADD STANDARDS

### 2.1 GENERAL

This document presents guidelines for the development of CADD drawings and drawing files for the preliminary design of the CHSTP. Designers advancing the preliminary design shall develop CADD drawings in accordance with these common CADD parameters in order to promote drawing quality and consistency across the project's geographic sections.

### 2.2 DRAWING STANDARDS

Persons creating CHSTP drawings shall be responsible for adhering to the conventions set forth in this document. Requirements not stated in this document shall follow Caltrans CADD Standards located in Caltrans Plans Preparations Manual.

<http://www.dot.ca.gov/hq/oppd/cadd/usta/ppman/toc.htm>

#### 2.2.1 Drawing Preparation

Design for CHSTP project will be based on common California Coordinate System (CCS) vertical datum as described in the latest version of Caltrans Surveys Manual (Chapter 4, Survey Datums).

[http://www.dot.ca.gov/hq/row/landsurveys/SurveysManual/04\\_Surveys.pdf](http://www.dot.ca.gov/hq/row/landsurveys/SurveysManual/04_Surveys.pdf)

Printed alignment drawings will be prepared at the following (full size drawing) scales:

- 15% Design Level:
  - Horizontal 1"=200'; Vertical 1"=20' For undeveloped areas
  - Horizontal 1"=200'; Vertical 1"=20' For developed areas
  - Horizontal 1"=100'; Vertical 1"=10' In constrained urban areas
  - Horizontal 1"=50'; Vertical 1"=5' At stations and special study areas and as appropriate to achieve design level
- 30% Design Level:
  - Horizontal 1"=100'; Vertical 1"=10' for undeveloped, developed and constrained urban areas
  - Horizontal 1"=50'; Vertical 1"=5' At stations and special study areas and as appropriate to achieve design level
  - Structural & Architectural Scales per Caltrans Structural Seed file [http://www.dot.ca.gov/hq/oppd/cadd/rsc\\_files/webpage.php](http://www.dot.ca.gov/hq/oppd/cadd/rsc_files/webpage.php) and as appropriate to achieve design level

These scales are recommended and are to be confirmed with the Environmental Manager and Regional Manager. Other drawings types will be developed at scales commensurate with industry standards.

#### 2.2.2 Drawing Format

##### 2.2.2.1 Deliverables

CADD files for the alignment plans shall be available for transmittal in the following format:

- MicroStation V8 design files (DGN) format
- Adobe Acrobat portable document format (PDF)

Printed plan sets will be prepared at the following sizes.

- 11" x 17" drawings (half size)
- 22" x 34" drawings (full size plotted on 24" x 36")

Electronic submittals are required to review the files in a common platform and provide use of full-color graphics, easy navigation, and the ability to turn levels on and off for easier viewing.

### 2.2.2.2 Borders

Preliminary engineering drawings will conform to Caltrans CADD standard border dimensions and will incorporate CHSTP border information and appropriate design consultant information. CHSTP border as shown in Appendix B is available on the CHSTP ProjectSolve site.

[https://ww2.projectsolve2.com/eRoom/SFOF/CAHSRProgramMgmt/0\\_21ef7](https://ww2.projectsolve2.com/eRoom/SFOF/CAHSRProgramMgmt/0_21ef7)

### 2.2.2.3 Titles

The following information will be included in the title block of each drawing:

CALIFORNIA HIGH-SPEED TRAIN PROJECT  
SEGMENT DESIGNATION  
ALIGNMENT / OPTION

## 2.3 SOFTWARE PLATFORMS

### 2.3.1 CADD Software

Drawings prepared for the preliminary design will be prepared using MicroStation V8 or subsequent version release.

### 2.3.2 Design Applications Software

The use of design application software (i.e., InRoads, CAiCE, and GeoPak) in the development of alignments for the 15% Design level is at the discretion of the designer.

### 2.3.3 Base Mapping

High resolution, ortho-rectified aerial photogrammetry and 3D elevation data are commercially available and can be obtained from Intermap Technologies® for use as base mapping for the 15% Design level.

Engineering surveys and mapping for the post-15% Design level will meet the requirements defined in Technical Memorandum 1.1.4 – Engineering Surveys and Mapping.

### 2.3.4 CADD Resource Files

The CADD environment requires setup of the following resource files to achieve uniformity.

- **Seed files:** A seed file is a CADD template file that contains settings such as the project global origin and working units and does not contain design elements. Use of a project seed file with customized settings eliminates the need to establish drawing settings each time a CADD file is created. When creating a new design file, the appropriate seed file will be selected and copied to the desired folder and renamed based on the file naming conventions in Section 3.4. Caltrans seed files include: global origin, units – the 6 files represent the state 6 zones as designated by Caltrans MicroStation V8 standards for a 2-D or 3-D environment. For design files that fall within two zones, use the seed file which encompasses the majority of design. Caltrans state zone designations are included in Appendix A.
- **State Zones and Seed files:** MicroStation V8 seed files are provided for 6 zones that cover the state. Zones 1, 2, 3, 4, 5, and 6 cover the proposed CHSTP alignment corridor and include “zone tiles”: 1, 2, 3, 4, 5, and 6 per Caltrans standard. Appendix A presents the state zone maps for use in identifying appropriate seed files.

Resolution of the MicroStation V8 design environment establishes size and accuracy of these planes. Changing the resolution changes the size of existing geometry in the model and is not recommended.

- **Accuracy and Resolution:** The Resolution setting defines the worst-case accuracy for the design environment, which occurs at the very outer limits of the (very large) working area/volume. For example, working to a “worst case” accuracy of 0.0001 meters, the size of the design plane/cube is 900 million kilometers along each axis. Actual accuracy is many millions of times better when drawing near the origin of the design plane/cube, which is the usual situation.

Each CHSTP seed file name includes the California Zone unit, the reference to 6 primary planes of coverage and format:

- Z4 Zone 4, Plane (primary)
- MU US Survey Units
- 2d or 3d Eseed 2-D or 3-D English seed file
- Structure Seed Structures & Architecture
- V8.dgn MicroStation V8 format

CHSTP drawing files will be 2-D files. 3-D seed files are provided for support of design applications.

2D and 3D Seed files are found on the Caltrans site:

[http://www.dot.ca.gov/hq/oppd/cadd/rsc\\_files/webpage.php](http://www.dot.ca.gov/hq/oppd/cadd/rsc_files/webpage.php)

- Cell library: (\*.cel and/or \*.dgnlib) with CALTRANS standard symbology cells, templates of tables, standard note format, standard level library set up.
- Resource files: (\*.rsc) to include font format, are posted in the Caltrans site.
- Color table: drives standard colors to be used for Caltrans work.
- Standard and Custom Line Style Resource File: (\*.rsc) standard and custom lines styles particular to Caltrans plans production. A Line Style scale PDF is in support of scale factors for plans production.

Please note new resource file updates to V8 files PDF included on the Caltrans site to review specific changes to the above file types.

Designers using CAiCE and GIS at their discretion to support conceptual and final design file documentation can find supporting resources and documentation files in this same location below.

These files may be retrieved from the following location:

[http://www.dot.ca.gov/hq/oppd/cadd/rsc\\_files/webpage.htm](http://www.dot.ca.gov/hq/oppd/cadd/rsc_files/webpage.htm)

Units Definition file: The MicroStation Units.def file has been edited for U.S. Survey Foot as the English unit. The working units, master/sub unit definitions (Units.def file) for all CADD Drawings are based on the seed file provided by the PM. For V8 MicroStation files, the unit names will be:

- Master Units (MU)-----Survey Feet (FT)
- Sub Units (SU)-----Tenths (TN)
- Resolution: -----10,000 per Foot
- Working Area (each axis): -----170,591,236 Miles

## 2.4 DRAWING PREPARATION BEST PRACTICES

The information in the EZ-Guide (for quick reference only) comes from the CADD Users Manual and Plans Preparation Manual. Note that any changes, modifications or additions to Caltrans standards, conventions or work flow processes will be included only in the CADD Users Manual or Plans Preparation Manual and not in the EZ-Guide, which should be used only as a quick reference since the EZ-Guide has not been updated since March 2006.

### 2.4.1 Color and Line Weights

Line weights, line styles and graphical representations of features shall conform to the Caltrans CADD Users Manual, Plans Preparation Manual and the Standard Plans. Use Caltrans leveling convention and color tables. Following the Caltrans leveling convention from the inception of a drawing is the most efficient way of handling and sharing electronic information throughout the entire project delivery process.

### 2.4.2 Line Styles

Line Styles depict a recognizable pattern used mainly to distinguish existing features or objects from proposed features on no-dropout levels.

### 2.4.3 Text, Abbreviations and Symbology

Abbreviations, Acronyms and Symbols shall conform to CHSTP standards and augmented by Caltrans Standard Plans A10A through A10D, H1 and H2 and ES-1A through ES-1C.

## 2.5 FILE MANAGEMENT AND DIRECTORY STRUCTURE

Regional Designers will establish and maintain an electronic CADD file structure and file folders that promote efficient and effective storage and retrieval of active and archived CADD files.

## 2.6 CADD FILE TYPES

Design efforts will result in the creation of numerous CADD files, including reference files, sheet files, and working files. For the CHSTP, these standards will evolve to accommodate software, hardware, and project advancement at logical conversion or upgrade points. The different file types and general usage are discussed below.

### 2.6.1 Master Files

Master (base) files are intended as overlays to other CADD files are typically used to share design data between disciplines and designers. Typically master files include survey, mapping topography, utilities, and track alignment.

Master files contain specific design information in one continuous file and are referenced to sheet files. Additional or modified design information within a master file will automatically update in the sheet files. Master files are tied to the project coordinate system and shall not be moved, rotated, or scaled in order to preserve the coordinate system within the file and allow other master files to be attached coincident to each other. Master files shall not be nested. Nesting shall occur in sheet files with saved views.

See Section 2.7.1 for Master File Naming Convention.

### 2.6.2 Sheet Files

Sheet files will contain only sheet dependent information such as title block information, north arrow, bar scales, dimensions, and general notes. Master files within saved views are attached to the sheet files and clipped to display design information particular to that sheet. Information viewed in the sheet can be manipulated with level controls. Drawings containing details, sections, and elevations will be drawn within sheet files. Details, sections, and elevations will be drawn to a scale as required to convey the necessary design information and design intent. Sheet files incorporate necessary design information to create a design discipline drawing for inclusion in a specific deliverable plan set. Plotting for drawings will be done from the sheet files.

See Section 2.7.2 for Sheet File Naming Convention.

### 2.6.3 Working Files

Working files may be used by designers to develop various options for alignment, structures, or other facilities and may become either a reference file or sheet file. Working files will contain information to be used for design, calculation support, or "DRAFT" purposes only. Working files are not for inclusion in a specific deliverable plan set, nor are they to be referenced from any plan sheet file. Reference files may be attached as necessary. Working files maintain a design (.DGN) file extension.

Designers use working files to prepare various options and/or concepts of a design to avoid confusion and interference with reference files currently in use for actual deliverables. Using working files maintains a record of alternative conceptual design options that may have validity for the future but are not deemed "deliverables". CHSTP CADD standards apply to all CADD files including working files. Working files contain project design information prepared only in support of the creation of design discipline drawings or calculations. Working drawings to be plotted for any purpose, including temporary use, inclusion in calculation sets, etc. will be clearly labelled "Working Drawing – DRAFT -" within the electronic file such that a clear distinction can be made from reference or sheet file plots.

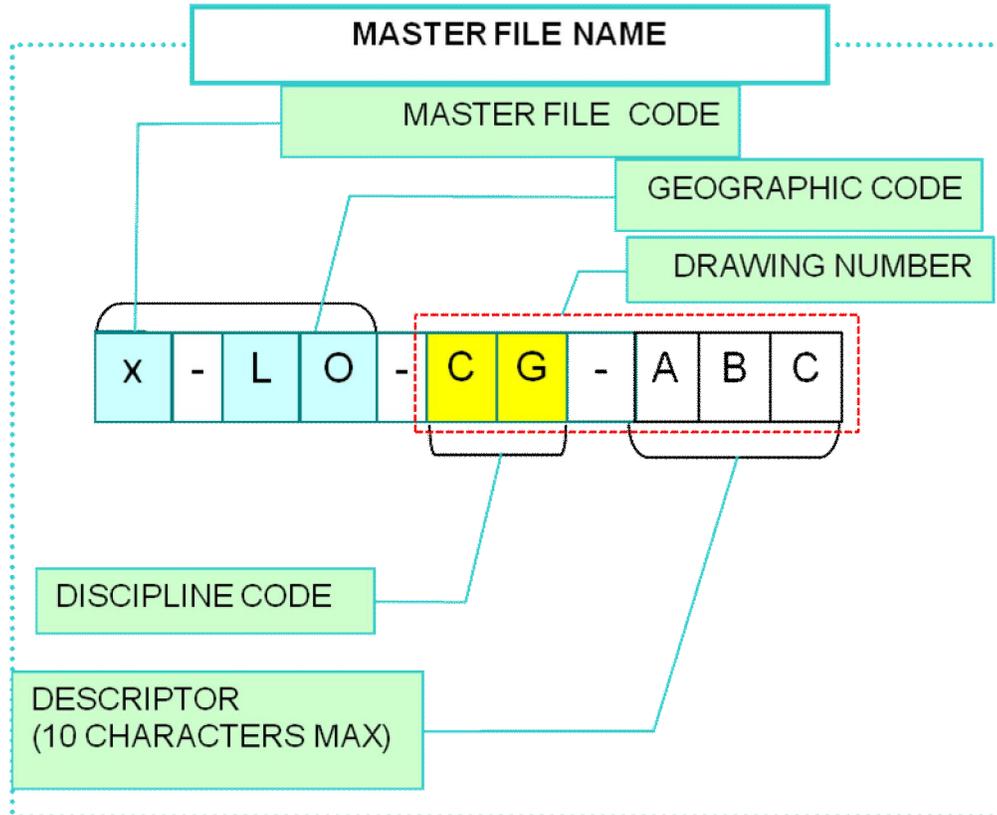
See Section 2.7.3 for Working File Naming Convention.

## 2.7 FILE NAMING CONVENTIONS

This section describes the naming conventions for various file types.

### 2.7.1 Master File Naming Convention

Master files are named using fifteen characters (plus the three-character extension “dgn”) based on the following template:



#### Master File Naming

Example: Palmdale to Los Angeles, Civil Drawing, Track Alignment, 200 scale

**X-PL-C-ALIGN-200.dgn**

**Geographic Location Code (two characters)**

The SECOND through FOURTH characters indicate the geographical location of a specific proposed project facility as follows:

**Geographic Code**

<b>Segment Identifier</b>	<b>Segment Code</b>
San Francisco to San Jose	FJ
San Jose to Merced	JM
Altamont Pass	AJ
Sacramento to Merced	SM
Merced to Fresno	MF
Fresno to Bakersfield	FB
Bakersfield to Palmdale	BP
Palmdale to Los Angeles	PL
Los Angeles to Anaheim	LO
Los Angeles to San Diego	LD

**Discipline Code (DC) (one OR two characters)**

The FIFTH character indicates the design discipline:

	CHSTP DISCIPLINE CODE		DISCIPLINE DESIGNATORS DESCRIPTION
	1ST	2ND	
ARC	A		ARCHITECTURE
	A	B	GENERAL
	A	D	DEMOLITION
	A	E	ELEMENTS
	A	F	FINISHES
	A	G	GRAPHICS
	A	I	INTERIORS
	A	J	BUILDINGS
	A	K	USER DEFINED
	A	S	SITE
GEN	B		GENERAL
CIV	C		CIVIL
	C	B	GENERAL
	C	D	DEMOLITION
	C	G	GRADING
	C	H	HYDROLOGY
	C	I	CONSTRUCTION STAGING
	C	J	USER DEFINED
	C	P	PAVING
	C	R	ROADWAYS
	C	S	SITE
	C	T	GRADE SEPARATION/CROSSINGS
ELE	E		ELECTRICAL
	E	B	GENERAL
	E	D	DEMOLITION
	E	I	INSTRUMENTATION
	E	J	USER DEFINED
	E	L	LIGHTING
	E	P	POWER
	E	S	SITE
	E	T	TELECOMMUNICATIONS
	E	Y	AUXILIARY SYSTEMS

	CHSTP DISCIPLINE CODE		DISCIPLINE DESIGNATORS DESCRIPTION
	1ST	2ND	
FIR	F		FIRE PROTECTION
	F	A	DETECTION AND ALARM
	F	B	GENERAL
	F	J	USER DEFINED
	F	M	DETECTION AND ALARM
	F	X	FIRE SUPPRESSION
GEO	G		GEOTECHNICAL
	G	B	GENERAL
	G	J	USER DEFINED
SIGNLS	H		SIGNALIZATION
	H	B	GENERAL
	H	J	USER DEFINED
	H	K	USER DEFINED
IND	I		INDUSTRIAL
	I	B	GENERAL
	I	E	EQUIPMENT
	I	V	VEHICLE
	I	J	BUILDINGS
	I	K	USER DEFINED
LAN	L		LANDSCAPING
	L	B	GENERAL
	L	D	DEMOLITION
	L	I	IRRIGATION
	L	J	USER DEFINED
	L	L	LIGHTING
	L	P	PLANTING
	L	R	RELOCATION
	L	S	SITE
MECH	M		MECHANICAL
	M	B	GENERAL
	M	D	DEMOLITION
	M	H	HVAC
	M	I	INSTRUMENTATION
	M	J	USER DEFINED
	M	P	PIPING
	M	S	SITE

	CHSTP DISCIPLINE CODE		DISCIPLINE DESIGNATORS DESCRIPTION
	1ST	2ND	
MF	M	#	MAINTENANCE FACILITY
	M	1	TBD
	M	2	TBD
OPTN	O		OPERATIONS
	O	B	GENERAL
	O	J	USER DEFINED
PLU	P		PLUMBING
	P	D	DEMOLITION
	P	J	USER DEFINED
	P	P	PIPING
	P	Q	EQUIPMENT
	P	S	SITE
COMM	Q		COMMUNICATIONS
	Q	A	AUDIO VISUAL
	Q	B	GENERAL
	Q	C	CLOCK AND PROGRAM
	Q	I	INTERCOM
	Q	J	USER DEFINED
	Q	K	USER DEFINED
	Q	M	MONITORING
	Q	N	DATA NETWORKS
	Q	T	TELEPHONE
	Q	Y	SECURITY
RW	R		RIGHT-OF-WAY
	R	B	GENERAL
	R	J	USER DEFINED
	R	K	USER DEFINED
STR	S		STRUCTURAL
	S	B	GENERAL
	S	D	DEMOLITION
	S	F	FRAMING
	S	J	BUILDING
	S	K	USER DEFINED
	S	S	SUBSTRUCTURES
	S	T	BRIDGES
	S	V	VIADUCTS

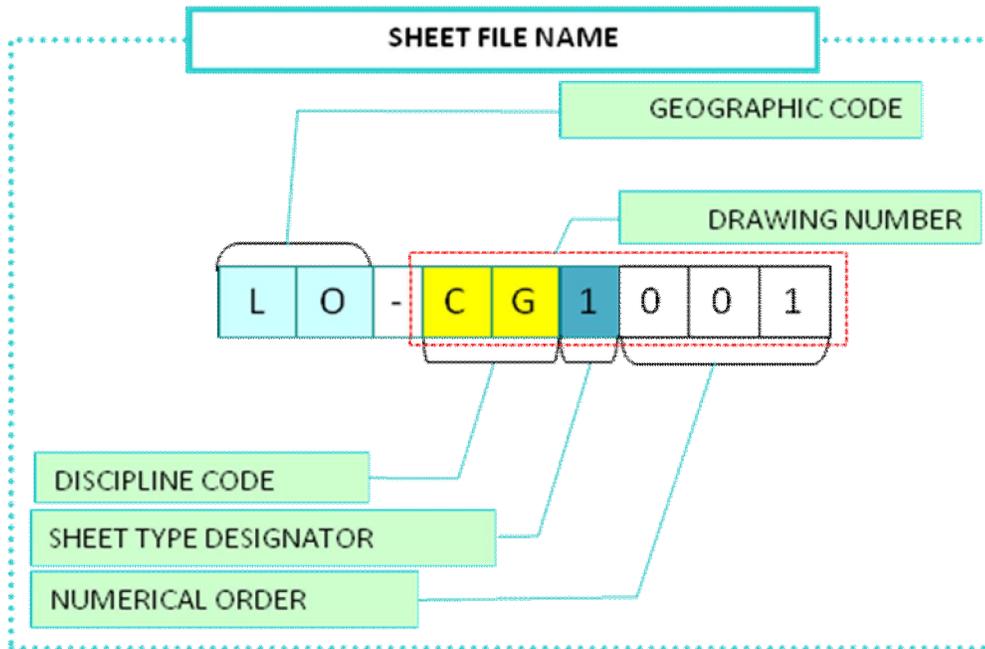
	CHSTP DISCIPLINE CODE		DISCIPLINE DESIGNATORS DESCRIPTION
	1ST	2ND	
TRA	T		TRACKWORK
	T	B	GENERAL
	T	C	TRAIN CONTROL (AUTOMATIC)
	T	H	SIGNALIZATION
	T	I	INTEGRATION / INTERFACE
	T	J	USER DEFINED
	T	L	YARD CONTROL
UTIL	U		UTILITIES
	U	B	GENERAL
	U	J	USER DEFINED
SUR	V		SURVEY
	V	B	GENERAL
	V	J	USER DEFINED
OCS	W		OVERHEAD CONTACT SYSTEM
	W	B	GENERAL
	W	J	USER DEFINED
ETOPO	X		EXISTING TOPOGRAPHY
	X	B	GENERAL
	X	J	USER DEFINED
TPWR	Y		TRACTION POWER
	Y	B	GENERAL
	Y	J	USER DEFINED
SYSG	Z		SYSTEM GENERAL
	Z	B	GENERAL
	Z	J	USER DEFINED

### **Content Descriptor**

The SIXTH through FIFTEENTH characters indicate the type of information generally contained in the reference file (i.e. Alignments, Layouts, Profiles, Topometric, Right-of- Way, etc.). The descriptor shall not contain special characters in it and must remain unchanged throughout the design process. All Alpha characters not used shall be used at designer's discretion.

## 2.7.2 Sheet File Naming Convention

Sheet File names will be named using nine characters (plus the three-character extension “.dgn”) based on the following template:



### Sheet File Naming

Example: Los Angeles to Palmdale, Civil Drawing, Drawing 1000, Maintenance Facility (M1 - M5 Depending on Type of Facility) Where Applicable.

**PL-CG-1000-M1.dgn**

### Drawing Number

The drawing number to be shown in the title block will be a derivative of discipline code and sequence number in the set.

Example: CADD Filename: PL-CG-1000-M1.dgn  
 Drawing Number to be shown in Title Block: CG1000

**Sequence Number (0000)**

The FIFTH through EIGHTH characters indicate the sequence number as established by the CHSTP PM. The sequence number will be assigned in series format, with blocks of drawings reserved for a specific drawing type or discipline as indicated in the following table:

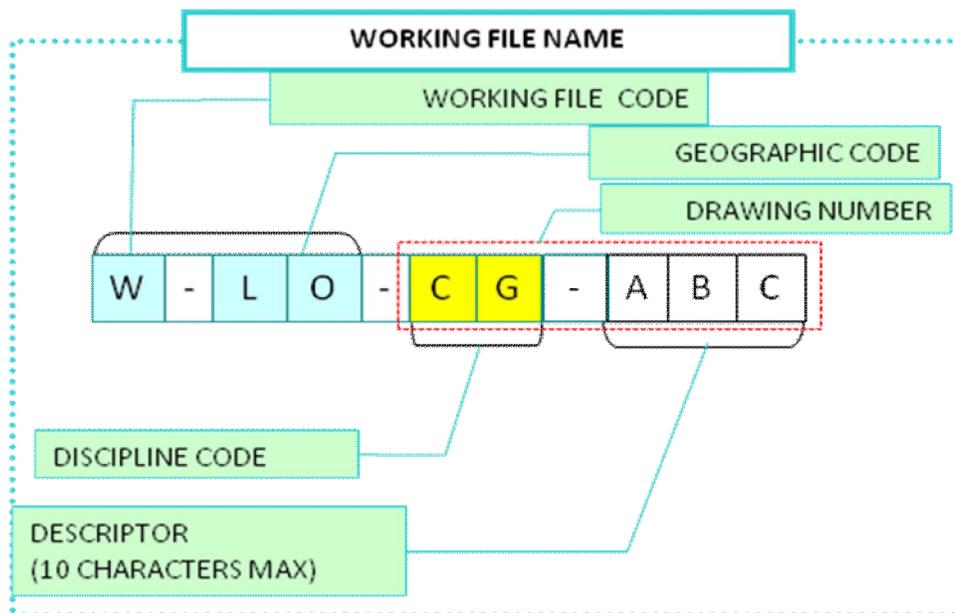
**Sequence Number**

<i>Sequence Order</i>	<i>Drawing Type</i>
0	General Drawings (Title Sheet, Drawing Index, Notes, Legends and Abbreviations)
1	Plans and Profiles
2	Elevations
3	Sections
4	Large Scale Views
5	Details
6	Schedules, Schematics and Diagrams
7 and 8	User Defined
9	3D Representations

Note: Designers are to confirm sequence number as this may vary depending on the contract and/or deliverable.

**2.7.3 Working File Naming Convention**

Working file names will be similar to reference file names (with the recognition that they may become reference files), with a “W” as the file designator. Working files are named using fifteen characters (plus the three-character extension “.dgn”) based on the following template:



**Working File Naming**

Example: Merced to Fresno, Structures Drawing, Elk Grove Bridge Design in Progress

**W-MF-ST-ELKGR-BRDG.dgn**

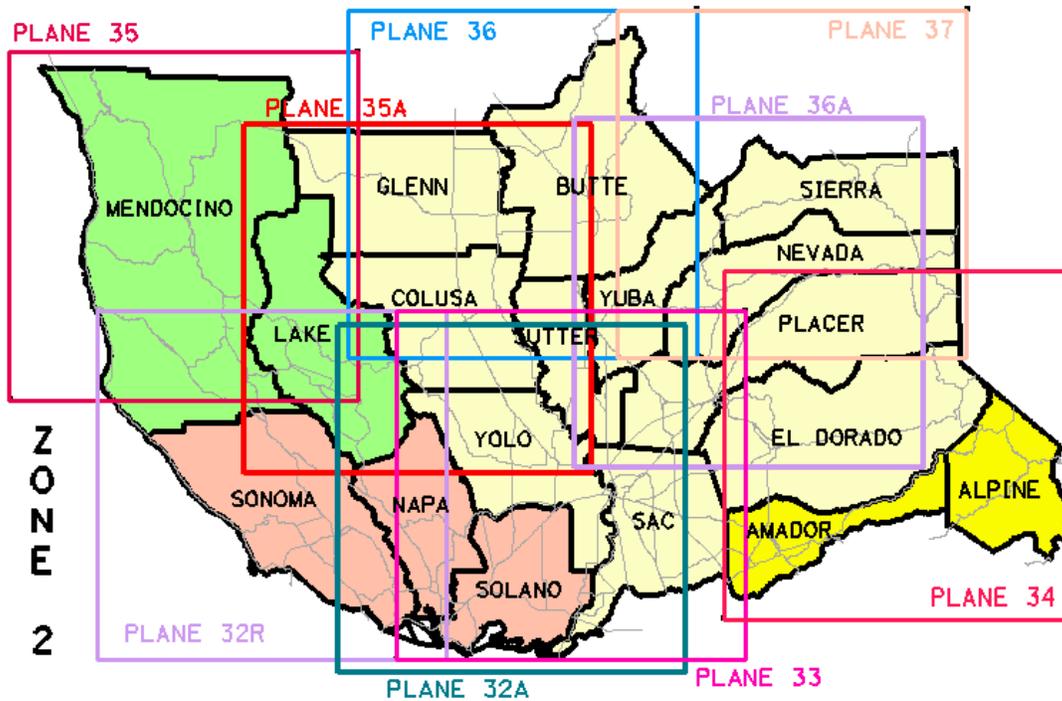
### 3.0 SOURCE INFORMATION AND REFERENCES

1. Caltrans CADD Users Manual  
<http://www.dot.ca.gov/hq/oppd/cadd/usta/caddman/default.htm>
2. Caltrans Plans Preparations Manual  
<http://www.dot.ca.gov/hq/oppd/cadd/usta/ppman/toc.htm>
3. CHSTP Technical Memorandum TM 1.1.4 – Engineering Surveys and Mapping  
[https://ww2.projectsolve2.com/eRoom/SFOF/CAHSRProgramMgmt/0\\_3eb7e](https://ww2.projectsolve2.com/eRoom/SFOF/CAHSRProgramMgmt/0_3eb7e)
4. CHSTP Technical Memorandum 15% Design Scope Guidelines  
[https://ww2.projectsolve2.com/eRoom/SFOF/CAHSRProgramMgmt/0\\_3eb90](https://ww2.projectsolve2.com/eRoom/SFOF/CAHSRProgramMgmt/0_3eb90)

## APPENDIX A: CALTRANS STATE ZONE MAPS

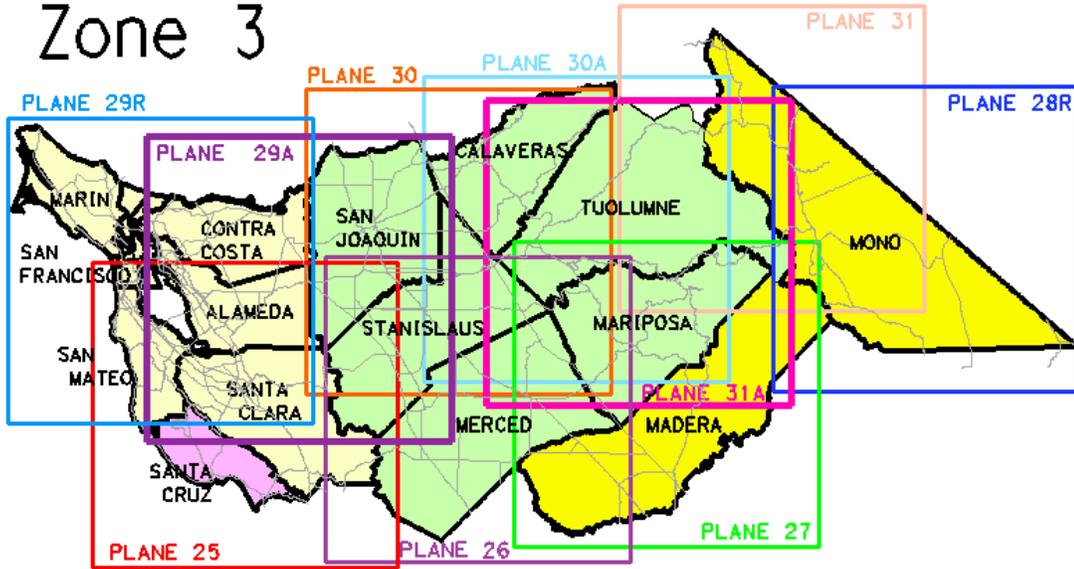
Caltrans State Zone Maps are presented in Appendix A.

[http://www.dot.ca.gov/hq/oppd/cadd/rsc\\_files/webpage.php](http://www.dot.ca.gov/hq/oppd/cadd/rsc_files/webpage.php)



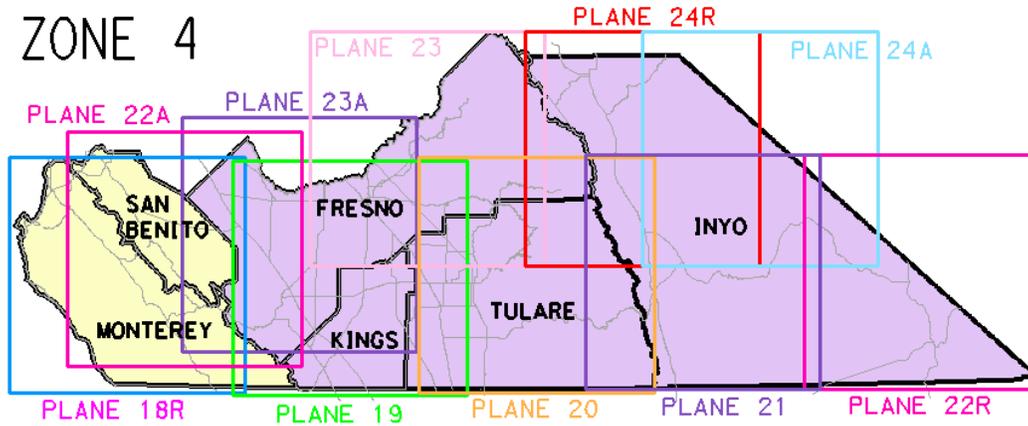
PLANES-English	X CENTER	Y	X GLOBAL ORIGIN	Y
32R Sonoma	6280000	1982000	6065251.6352	1767251.6352
32A Solano / Napa	6576000	1966000	6361251.6352	1751251.6352
33 Yolo	6648000	1982000	6433251.6352	1767251.6352
34 El Dorado	7052000	2032000	6837251.6352	1817251.6352
35 Mendocino	6171000	2302000	5956251.6352	2087251.6352
35A Colusa/Glenn/Lake	6460000	2213000	6245251.6352	1998251.6352
36 Butte	6589000	2354000	6374251.6352	2139251.6352
36A Yuba/Nev/Placer	6868000	2219000	6653251.6352	2004251.6352
37 Sierra	6921000	2354000	6706251.6352	2139251.6352

# Zone 3

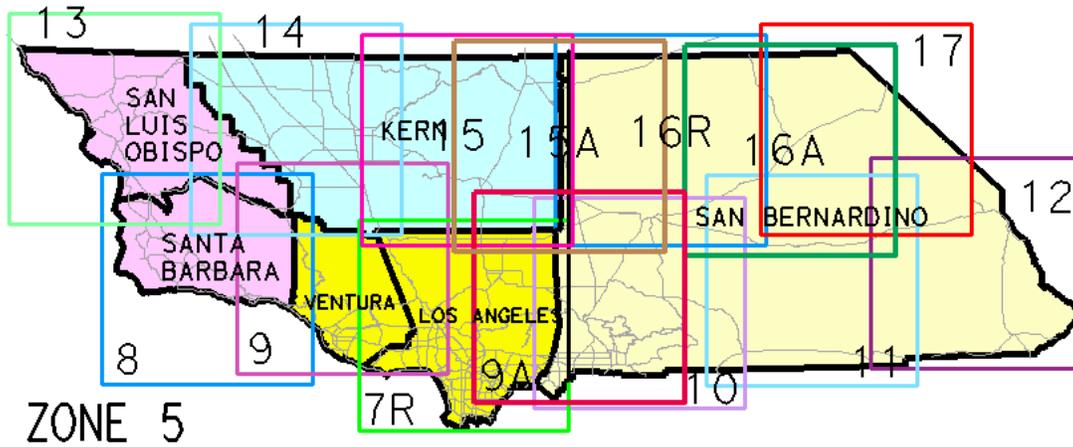


PLANES-English	X CENTER	Y	X GLOBAL ORIGIN	Y
25 Santa Clara	6163000	1906000	5948251.6352	1691251.6352
26 Merced	6492000	1914000	6277251.6352	1699251.6352
27 Madera	6757000	1935000	6542251.6352	1720251.6352
28R Mono South	7122000	2154000	6907251.6352	1939251.6352
29R S. F. Bay Area	6045000	2109000	5830251.6352	1894251.6352
29A Contra Costa	6239000	2084000	6024251.6352	1869251.6352
30 Stanislaus	6464000	2150000	6249251.6352	1935251.6352
30A Tuolumne	6684000	2168000	6469251.6352	1953251.6352
31 Mono North	6905000	2268000	6690251.6352	2053251.6352
31A Tuolumne	6719000	2134000	6504251.6352	1919251.6352

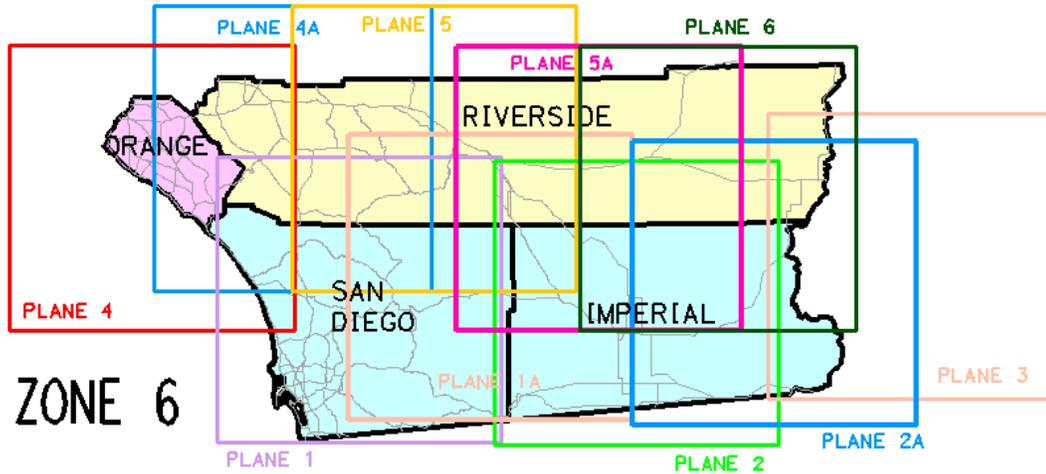
# ZONE 4



PLANES-English	X CENTER	Y	X GLOBAL ORIGIN	Y
18R Monterey	5892000	2016000	5677251.6352	1801251.6352
19 Kings	6299000	2010000	6084251.6352	1795251.6352
20 Tulare	6641000	2016000	6426251.6352	1801251.6352
21 Inyo SW	6945000	2022000	6730251.6352	1807251.6352
22R Inyo SE	7346000	2022000	7131251.6352	1807251.6352
22A San Benito	5997000	2063000	5782251.6352	1848251.6352
23 Fresno	6441000	2247000	6226251.6352	2032251.6352
23A Fresno	6207000	2090000	5992251.6352	1875251.6352
24R Inyo N	6835000	2247000	6620251.6352	2032251.6352
24A Inyo NE	7050000	2247000	6835251.6352	2032251.6352



PLANES-English	X CENTER	Y	X GLOBAL ORIGIN	Y
7R Los Angeles	6476000	1927000	6261251.6352	1712251.6352
8 Santa Barbara	5951000	2021000	5736251.6352	1806251.6352
9 Ventura	6227000	2043000	6012251.6352	1828251.6352
9A LA/SanBernardino	6710000	1985000	6495251.6352	1770251.6352
10 San Bernadino SW	6831000	1972000	6616251.6352	1757251.6352
11 San Bernadın S	7184000	2018000	6969251.6352	1803251.6352
12R San Bernadino SE	7518000	2053000	7303251.6352	1838251.6352
13 San Luis Obispo	5763000	2350000	5548251.6352	2135251.6352
14 Kern West	6133000	2326000	5918251.6352	2111251.6352
15 Kern East	6482000	2305000	6267251.6352	2090251.6352
15A Kern E/San Bern	6671000	2291000	6456251.6352	2076251.6352
16R San Bernadino NW	6875000	2305000	6660251.6352	2090251.6352
16A San Bernadino NE	7140000	2283000	6925251.6352	2068251.6352
17 San Bernadino NE	7295000	2326000	7080251.6352	2111251.6352



PLANES-English	X CENTER	Y	X GLOBAL ORIGIN	Y
1 San Diego	6380000	1987000	6165251.6352	1772251.6352
1A San Diego/Imperial	6578000	2021000	6363251.6352	1806251.6352
2 Imperial	6799000	1983000	6584251.6352	1768251.6352
2A Imperial/Riverside	7007000	2012000	6792251.6352	1797251.6352
3 Arizona	7212000	2053000	6997251.6352	1838251.6352
4 Orange	6068000	2156000	5853251.6352	1941251.6352
4A Orange/Riverside	6280000	2216000	6065251.6352	2001251.6352
5 Riverside W	6493000	2216000	6278251.6352	2001251.6352
5A Riverside Central	6742000	2155000	6527251.6352	1940251.6352
6 Riverside E	6922000	2155000	6707251.6352	1940251.6352

## APPENDIX B: DRAWING BORDER

Link to the DGN file for the CHSTP Border follows:

[https://ww2.projectsolve2.com/eRoom/SFOF/CAHSRProgramMgmt/0\\_48e9b](https://ww2.projectsolve2.com/eRoom/SFOF/CAHSRProgramMgmt/0_48e9b)



## APPENDIX C: CELL LIBRARY

Link to Cell Libraries on Project Solve follows:

[https://ww2.projectsolve2.com/eRoom/SFOF/CAHSRProgramMgmt/0\\_8056a](https://ww2.projectsolve2.com/eRoom/SFOF/CAHSRProgramMgmt/0_8056a)

## APPENDIX D: DGNLIB

### CHSTP DGNLIB Levels

#### *Caltrans Existing Level 0 - 999 (Modified to Address Rail Components)*

<u>Name of layer</u>	<u>Number</u>	<u>Description</u>
0 Default		
1 Control	1	(Includes Survey Monuments)
		
999 Stage 20 Anno	999	Stage 20 Const & Temp Traffic Anno

#### *Track:*

<u>Name of layer</u>	<u>Number</u>	<u>Description</u>
1000 Undefined	1000	Undefined
		
1099 Undefined	1099	Undefined

#### *Traction Power Substation System:*

<u>Name of layer</u>	<u>Number</u>	<u>Description</u>
1100 Undefined	1100	Open
		
1199 Undefined	1199	Open

#### *Overhead Contact System:*

<u>Name of layer</u>	<u>Number</u>	<u>Description</u>
1200 Undefined	1200	Open
		
1299 Undefined	1299	Open

**Signaling System:**

<u>Name of layer</u>	<u>Number</u>	<u>Description</u>
1300 Undefined	1300	Open
		
1399 Undefined	1399	Open

**Communication System:**

<u>Name of layer</u>	<u>Number</u>	<u>Description</u>
1400 Undefined	1400	Open
		
1499 Undefined	1499	Open

**Train Control System:**

<u>Name of layer</u>	<u>Number</u>	<u>Description</u>
1500 Undefined	1500	Open
		
1599 Undefined	1599	Open

Link to DGNLIB on Project Solve follows:

[https://ww2.projectsolve2.com/eRoom/SFOF/CAHSRProgramMgmt/0\\_816d8](https://ww2.projectsolve2.com/eRoom/SFOF/CAHSRProgramMgmt/0_816d8)