2

Landscape Architecture PS & E Guide

SECTION 2

Project Plan Standards

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Project Plan Standards

General

Project plans are drawings containing information from which Contractors prepare bids, successful bidders construct projects, and engineers inspect the Contractor's work. These plans, as revised during construction, become permanent records in the form of As-Built plans for future reference.

Project Plan Review

Review the project plans to ensure that sufficient information is provided so that the work shown is both biddable and buildable. General guidelines for review are provided below. Additional review information is provided in the Plans Preparation Manual.

Layout Sheets for Highway Planting Projects

These plan sheets are to adequately show the work to be performed. Layout line/centerline designations are to be shown. Cut and fill lines, existing pavements, curbs, dikes, sidewalks, driveways, wheelchair ramps, road approaches, right of way lines, and topography (when pertinent) are to be shown. Legends and symbols used, which are not included in the Standard Plan abbreviations and symbols must be defined on the layout sheets for irrigation plans. Planting legends and symbols are shown on the Plant List and Specifications sheet.

Detail Sheets

These sheets should provide supplemental information that cannot be shown on the layout plan sheets because of complex and extensive details required. The details shown on the Detail Sheet are unique to a specific project and not available in the Standard Plans.

Plan Preparation

In addition to the guidelines set forth in this manual, highway planting plans must be prepared in accordance with (but not limited to) instructions given in the following publications produced by the DES-OE:

- Ready To List Guide (RTL Guide)
- Plans Preparation Manual
- CADD (Computer Aided Design Drawings) Users Manual

Plan Sheet Size

Caltrans will continue to use the established 22" x 34" trim line dimensions printed on 24" x 36" paper.

Caltrans (Roadway) CADD Units

There is only ONE setting for all CADD prepared Highway Construction project including Highway Planting projects. This setting includes the following:

Master Units (MU) -------- feet
Sub Units (SU) ---------- 10 (tenths per foot)
Positional Units (PU) ----- 1000 (Pos. Units per sub unit)
Working Area ---------- 429,496 (squared feet)

The above setting has 1000 positional units between each tenth. <u>This is the only setting for Highway Construction projects and it should never be changed</u>. Note: If the number of positional units was inadvertently increased (more positional units per tenth), the working area (design plane size) would become smaller and the coordinate value of a given precise point would become a different value. The accuracy of measuring and dimensioning would improve, but that is not how Highway Construction projects are handled at Caltrans.

Caltrans CADD Cell Libraries

The intent of the Caltrans cell libraries is to provide users on all CADD systems performing Caltrans work with the following functionality:

- A set of symbols which conform to Caltrans design specifications and drafting standards.
- Identical cell libraries which exist on all CADD systems to facilitate the translation and transfer of CADD drawings.
- The freedom for individual users, functional design groups or districts to develop and use cell libraries.

Three types of libraries have been defined to help the user achieve the functionality listed above:

- The Master Cell Library contains all Caltrans CADD approved cells and is intended to be the library of greatest use; shared in common among all users statewide.
- The District Cell Library contains cells which are specific to district needs. This library also contains cells that are candidates to be included into the Master Cell Library. There is one District Cell Library for each district.
- The third cell library is the Work Cell Library and is created and maintained by the CADD operator. These libraries contain cells not found in the Master or District Cell Libraries and contain cells unique to the needs of the individual user.

Definitions

The following definitions are included to help the user understand this section:

Cell	A grouping of graphical elements identified by name which can be applied an unlimited number of times to an unlimited number of graphic files.
Cell Library	A file which contains cells. Any number of design files can simultaneously share this file.
Cell Origin	The Cell Origin is the handle point of the cell. The exact placement of a cell determined by its origin. Each cell must have an origin before it can be created as a cell.
Cell Selector	A feature in MicroStation that allows a user to view and place cells which have been pre-selected. A cell selector can contain cells from more than just one Cell Library.
Drop Status	The operation of disassociating the graphical components from their group as a cell.
Nested Cell	A cell that contains another cell. (This sometimes leads to the corruption of the cell).
Pattern Cell	A cell used in a repeated application along a linear element. Cells can also be used in repeated applications to pattern a closed area.
Symbol	The same element as a cell. These names are used interchangeably among the various graphic software.
Terminator Cell	A cell used at the beginning or end of a linear element such as a line or arc. The cell usually rotates to the angle defined by the last tangent section of the linear element.
Work Cell Library	The library owned and maintained by the individual CADD operator, which contains necessary cells not found in the Master or District Cell Libraries.

CADD Project Plan Data Levels

CADD permits the separation of data by the kind of data on various layers called “levels”. A single graphical element cannot span two levels, e.g., a single line can be on only one level.

The use and application of the leveling convention should be uniformly observed for the following reasons:

Work Transfer

To efficiently transfer work between functional units, CADD drawings must conform to a uniform leveling convention. If the same leveling convention is used, considerable time and effort is saved in obtaining only the desired information.

Multi-Operators

It is not uncommon for more than one person to work on the same drawing file. For the drawing file to be effectively and efficiently used by all, each operator must conform to the same uniform leveling convention.

Drawing Life

At Caltrans, drawings are active for several years and often longer. As-builts stored as dgn files can be quickly used to start a new project or preliminary study. How the data is entered today (i.e., what levels are used for what kinds of data) must be readily apparent for a long period, often after the original operators are no longer available. This problem is minimized with a uniform leveling convention.

Highway/Landscape Leveling Convention

General Content of Highway/Landscape levels is as follows:

Level 1	Control Data
Levels 2-8, 11 & 12	Basic Topographic Map Data
Levels 9 & 10	Sheet Formats & Seal Information
Levels 13 – 28, 30	Alignments and Construction Details
Levels 31 – 33	Right of Way Data
Levels 29, 34 – 59	Data for specific type of plan sheet
Level 60	Non-geographical Drawing Data
Levels 61 & 62	HQ & As-Built Changes
Level 63	Engineer Signature

"Unassigned" levels may be used at the discretion of the CADD Operator.

Summary of Highway/Landscape Levels

Level	*Content*
1	Control (Includes Survey Monuments)
2	Existing Manmade Features
3	Existing Roadway Features
4	Existing Vegetation and Natural Features
5	Existing Utilities and Utility Facilities
6	Existing Hydrographic Features
7	Relief Features – Contours
8	Spot Elevations and Contour Annotations
9	Profile Grid
10	Border Sheets & Seal Information
11	Break Line, Terrain Features for 3D & Profile Grid
12	Coordinate Grid Ticks and Labels and Construction Staking Survey Control Data
13	Ramp, Over and Under Crossing Alignment Data
14	Ramp, Over and Under Crossing Annotation
15	Mainline Alignment Date
16	Mainline Alignment Annotation
17	Frontage Road Alignment Data
18	Frontage Road Alignment Annotation
19	Undefined
20	Pavement Edges
21	Curbs, Gutters, Dikes, Overside & Edge drains
22	Miscellaneous Construction Features
23	Layout Notes
24	Obliteration, AC Resurfacing & Cold Planing
25	Temporary Road Connections and Alignments, also for Railroad, Bike & Pedestrian Paths & Creek Alignments
26	Undefined
27	Undefined
28	Undefined
29	Existing Irrigation - Includes Annotation
30	Cut and Fill Data
31	Existing Right of Way Boundaries
32	New Right of Way, Fences & ESA's
33	Right of Way Text & Annotation
34	Temporary Water Pollution Control
35	Permanent Erosion Control
36	Drainage
37	Drainage Annotation
38	Sanitary Sewer
39	Sanitary Sewer Annotation
40	New Utilities - Includes Annotation
41	Contour Grading
42	Pavement Elevations
43	Pavement Markers and Striping
44	Pavement Markers and Striping Annotation
45	Signing
46	Construction Area Signing
47	Electrical
48	Electrical Annotation
49	Planting and Landscaping

Summary of Highway/Landscape Levels continued

Level	Content
50	New Irrigation - Includes Annotation
51	Stage 1 Construction and Temporary Traffic Facilities
52	Stage 1 Construction and Temporary Traffic Facilities Annotation
53	Stage 2 Construction and Temporary Traffic Facilities
54	Stage 2 Construction and Temporary Traffic Facilities Annotation
55	Stage 3 Construction and Temporary Traffic Facilities
56	Stage 3 Construction and Temporary Traffic Facilities Annotation
57	Undefined
58	Sound Walls & Retaining Walls
59	Sound Walls & Retaining Walls Annotation
60*	Non-geographical Drawing Data*

Level	Content
61	Headquarters Changes
62	As-Built Changes
63	Engineer Signature

* Key Map, Title Sheet, Profiles, Typical Cross Sections, Superelevation Diagrams, Construction Details and Quantity of Summaries should reside on level 60. Undefined levels may be used for information that has not been assigned to a specific level.

When creating additional base maps (i.e., for Stage Construction or for plan sheets other than Layouts), level 11 (which is a drop out level) can be used to move some of the proposed design information. This would facilitate showing already constructed design information as dropped out for a later stage within the construction or sequencing of a project.

CADD Plan Data Levels

The following table identifies each level, its associated color and the specific information belonging on each level for Highway/ Landscape Construction projects.

Level No.	Color/ Name & Number	Title/Description/Content
1	Violet/5	Control All photo control data and topographic map survey information. Also includes district-added control information.
2	Yellow/4	Existing Manmade Features All existing man-made features not otherwise included in any other level, including but not limited to: All Buildings — Railroads (not to be improved) Gates — Retaining Wall Guard Rails — Right of Way Fences Median Barriers — Sidewalks contiguous to the outside curb Private Roads — Sound Walls For a Highway Planting project that is part of a Highway Construction project show "Existing Roadway Features" on level 3.

CADD Plan Data Levels continued

Level No.	*Color/ Name & Number*	*Title/Description/Content*
3	Yellow/4	Existing Roadway Features Edges of existing surfaced areas accessible to vehicles, bicycles or pedestrians within the Existing Roadway limits. Examples of Roadway Features are traveled way, edge of pavement lane striping and dikes. The limits of the Existing Roadway are the outside edges of the existing surfaced shoulders, curbs or dikes. Roadway includes all public highways, streets, surfaced and unsurfaced roads, and railroads (if the railroads are being improved as part of the project). Roadway does NOT include private roads such as driveways, ranch roads, parking lot streets, and roads and streets within large commercial establishments. See list on level 2 for items NOT to be shown on this Level.
4	Green/2	Existing Vegetation and Natural Features All natural vegetation, existing highway plantings, orchards, vineyards, marshes, and miscellaneous natural features such as rock outcrops, slides, etc. Note: For Irrigation Plans the proposed planting plan may be shown on this level as a reference.
5	Orange/6 (Note 1)	Existing Utility Features All existing underground and aboveground utility-type facilities (including signals, power and telephone poles and transmission poles for utility, railroad, highway, street, and private improvements). All existing drainage structures including culverts and headwalls, excluding substantial structures such as buildings. Also, includes district-added underground utilities. Note: Show annotation for Existing State & Non-State Utility Features on level 60.
6	Blue/1	Existing Hydro-graphic Features All lakes, rivers, streams, natural channels, swamps, and standing water.
7	Brown/7	Relief Features Contour Lines Only Contours (lines only) of the original terrain.
8	Brown/7	Spot Elevations and Contour Elevations Spot elevations and contour annotations.
9	Red/3	Profile Grid Dropout grid for full profile and combination plan and profile standard sheets (red grid lines).
10	White/0	Border Sheet Standard Border Sheets, Project Engineer's seal information, printed names of engineers, District-County-Route-Post Mile block, plan sheet name, match lines & north arrow (information associated with the border).
11	White/0	Variable Terrain features that define the ground surface for a 3D digital terrain model. Green grid lines for profile sheets. Can be used for dropping out information on non-dropout levels for possible additional base maps.
12	Violet/5	Coordinate Grid Coordinate grid ticks and labels. Construction Staking Survey Control Data.

CADD Plan Data Levels continued

Level No.	*Color/ Name & Number*	*Title/Description/Content*
13	White/0	Ramp, Over & Under Crossing Alignment Ramp, Over Crossing & Under Crossing alignment(s), includes station line and tick marks.
14	White/0	Ramp, Over & Under Crossing Annotation Ramp, Over & Under Crossing annotation, includes Route designation, alignment bearing and station number.
15	White/0	Mainline Alignment Mainline Alignment(s) for the main roadways, includes station line and tick marks.
16	White/0	Mainline Alignment Annotation Mainline Alignment Annotation, includes Route designation, alignment bearing and station number.
17	White/0	Frontage Road Alignment Frontage Road Alignment(s) includes station line and tick marks.
18	White/0	Frontage Road Alignment Annotation Frontage Road Annotation includes Route designation, alignment bearing and station number.
19	White/0	Undefined
20	White/0	Pavement Edges All lines necessary to depict the edges of pavement to be constructed, including traveled way, shoulders, road approaches and driveways.
21	White/0	Curbs, Gutters and Dikes All drawing information required depicting curbs, gutters, dikes, overside & edge drains, includes annotation.
22	White/0	Miscellaneous Construction Features All drawing information required to depict the construction shown on the layout plan, not specifically on other levels (e.g., new railings & barriers, crash cushions, sidewalks, bridge structures, miscellaneous paved areas.)
23	White/0	Layout Notes All notes, dimensions, and labeling required to describe the construction shown on the layout plan sheets, (except annotation specifically included on other levels) includes related lines and symbols such as leader lines, arrows, arrowheads, curve table, and legend.
24	Red/3	Obliteration and AC Resurfacing All drawing information required depicting planning, grinding, obliterating and resurfacing of roadways.
25	Red/3	Temporary Road Connections and Alignments All drawing information required to describe temporary road connections alignments, includes station line, tick marks and annotation. Also alignments for Railroad, Bike Paths, Creeks & Pedestrian Paths.
26	White/0	Undefined

CADD Plan Data Levels continued

Level No.	*Color/ Name & Number*	*Title/Description/Content*
27	White/0	Undefined Annotations for roadside planting may be shown on this level. By separating annotations, the planting symbols may be shown as dropped out on level 4 as a reference for the irrigation plans. See level 49 for planting and landscaping.
28	White/0	Undefined
29	Brown/7	Existing Irrigation All drawing information required to describe existing irrigation facilities, includes annotation.
30	Red/3	Cut & Fill Data All drawing data required describing the top of cut or toe of slope includes annotation.
31	Orange/6	Existing Right of Way Boundaries All drawing information required describing property lines, township lines, section lines, existing Right of Way lines, and existing easement lines. Existing fences used as right of way boundaries on Planting Plans and Irrigation Plans. Show annotation "R/W" on level 33.
32	Orange/6	New Right of Way Lines and Fences All drawing information required describing proposed Right of Way lines, easement lines, rights of entry, controlled access, fences and ESA (If boundaries and fences are too cluttered; then put on undefined level).
33	Orange/6	Right of Way Text All Text and Annotation that describes new and existing Right of Way on levels 31 and 32.
34	Orange/6	Temporary Water Pollution Control All drawing information required to describe Temporary Water Pollution Control, includes annotation.
35	Orange/6	Permanent Erosion Control All drawing information required to describe Permanent Erosion Control, includes annotation.
36	Blue/1	Drainage All drawing information required to describe drainage facilities to be constructed, including pipes, box culverts, headwalls, manholes, surfaced & unsurfaced ditches, ABM gutters and drains. Also includes irrigation facilities, except those included on levels 29 or 50.
37	Blue/1	Drainage Annotation All annotation that describes drainage facilities.
38	Violet/5	Sanitary Sewer All drawing information required describing sanitary sewer facilities to be constructed, including manholes and sewer lines.
39	Violet/5	Sanitary Sewer Annotation All annotation that describes sanitary sewer facilities.
40	Yellow/4 (Note 1)	New Utilities All drawing information required to describe utility relocation work above and below ground, includes annotation (See Note 1 for chosen Caltrans colors associated with a particular utility).

CADD Plan Data Levels continued

Level No.	*Color/ Name & Number*	*Title/Description/Content*
41	Violet/5	Contour Grading Proposed grading contours, slope lines, bench lines, includes annotation.
42	White/0	Pavement Elevations Elevation of pavement, shoulders, curbs, and gutters.
43	Red/3	Pavement Markers and Striping All drawing information required describing pavement markers, striping and markings.
44	Red/3	Pavement Markers and Striping Annotation All annotation that describes pavement markers, striping and markings.
45	Red/3	Signing All drawing information required to describe sign installations, guide markers, etc., includes annotation.
46	Red/3	Construction Area Signing All drawing information required describing Construction Area signing, including tables, details and annotation.
47	White/0 (Note 2)	Electrical All drawing information required describing signal and lighting installations.
48	Yellow/4	Electrical Annotation All annotation that describes signal and lighting installations.
49	Green/2	Planting and Landscaping All drawing information required describing highway planting, landscaping, erosion control, etc., includes annotation. Note: Annotations for roadside planting should be shown on level 27. By separating annotations, the planting symbols may be shown as dropped out on level 4 as a reference for the irrigation plans.
50	Blue/1	New Irrigation All drawing information required describing new irrigation facilities for highway planting and landscaping (shown on level 49), includes annotation (The construction of other irrigation facilities is to be included on level 36.)
51	Red/3	Stage 1 Construction and Temporary Traffic Facilities All drawing information required describing detours, sequences of construction, temporary barriers, temporary drainage requirements, etc. This level can also accommodate Stage 4, Stage 7, etc., if necessary.
52	Red/3	Stage 1 Construction and Temporary Traffic Facilities Annotation All annotation that describes detours and sequences of construction.
53	Red/3	Stage 2 Construction and Temporary Traffic Facilities All drawing information required describing detours, sequences of construction, temporary barriers, temporary drainage requirements, etc. This level can also accommodate Stage 5, Stage 8, etc., if necessary.

CADD Plan Data Levels continued

Level No.	*Color/ Name & Number*	*Title/Description/Content*
54	Red/3	Stage 2 Construction and Temporary Traffic Facilities Annotation All annotation that describes detours and sequences of construction.
55	Red/3	Stage 3 Construction and Temporary Traffic Facilities All drawing information required describing detours, sequences of construction, temporary barriers, temporary drainage requirements, etc. This level can also accommodate Stage 6, Stage 9, etc., if necessary.
56	Red/3	Stage 3 Construction and Temporary Traffic Facilities Annotation All annotation that describes detours and sequences of construction.
57	White/0	Undefined
58	White/0	Sound Wall and Retaining Wall All drawing information required to depict the construction of Sound Walls and Retaining Walls, includes the plan and elevation views.
59	White/0	Sound Wall and Retaining Wall Annotation All annotation that describes sound walls and retaining walls includes curve table for layout lines of walls.
60	White/0	Non-geographical Drawing Data All drawing information that is non-geographical, such as, details, sectional views, cross sections, profiles, quantities and strip maps. Plan sheets that typically place elements on this level include: Title Sheet, Typical Cross Sections, Key Map, Profiles, Super Elevation Diagrams, Construction Details and Summary of Quantities.
61	Yellow/4	Headquarter Changes All final plan revisions performed by HQ Office Engineer after PS&E Submittal and before Advertising and Award.
62	Red/3	As-Built Changes Changes made during construction that need to be shown on the signed original plans. Revisions are depicted by lining out the original information (do not obscure) and placing the new information.
63	White/0 & Red/3 (Note 3)	Engineer Seal and Signature Project Engineer signature. Identification stamps for electronic As-Awarded plans and electronic As-Built plans.

Exceptions or Flexibility from the Caltrans Standard Leveling Convention

The Caltrans Standard Leveling Convention should not be changed. However, there are times when an exception (or some flexibility) may expedite the handling of a project to achieve the desired intent. Utilizing the undefined levels will handle most of the situations not defined by the standard leveling convention. When using undefined levels, communicate to others what was done in order to eliminate the loss of efficiency and productivity.

Exceptions or Flexibility from the Caltrans Standard Leveling Convention continued

Example:

Existing utilities belong on level 5, color orange/6. Level 5 is a dropout level, which changes the weight of the lines representing the utilities to a zero weight and changes the solid line to a dotted line. In the past, some Contractors and Resident Engineers could not clearly see the utility line depicted on the Contract Plans, thus creating confusion and a possible source of conflict.

One way to handle the situation is to move the utility information to an undefined level (which does not dropout). Thus the lines representing the utilities will be more visible on the Contract Plans. If the existing utilities are placed on a non-dropout level, 2 features/attributes have been added to help distinguish existing from proposed. The symbology for existing utilities will have a lowercase letter while proposed utilities will have an uppercase letter. Existing utilities will be shown as a thinner line while proposed utilities will be shown as a thicker line. The difference in width is the important point in distinguishing between existing and proposed. The suggested difference in line weight (wt) is **wt = 1** for existing and **wt = 3** for proposed. On a crowded or cluttered plan sheet, another suggestion would be to use line weight **wt = 0** for existing and **wt = 2** for proposed.

Note 1:

Colors have been assigned to various utilities for 2 reasons:

1. To easily distinguish between the various utilities when viewing the design files in the monitor.
2. To assist in the future ability to plot utility verification maps in color. The color yellow is not used because it is difficult to see when plotted.

(See cell "AAUTIL" in the Caltrans Cell Library for the assigned colors. Caltrans custom line styles depicting utilities have been defaulted to these assigned colors).

Note 2:

Traffic Electrical has only 1 level (level 47) to place design information. To assist the CADD operator in distinguishing between the various electrical components, cells have been created in various colors, grouped by type of electrical components or symbols.

Note 3:

Level 63 is now reserved for the Engineer's Signature. The color white/0 is used for the Engineer's signature (whenever used). The color red/3 is for the "As-Awarded" and "As-Built" cells created to be used "in lieu" of the Engineer's signature when the design file (dgn) is used after PS&E instead of a TIFF or PDF file.

Scales and Working Area determined by the Changing of Positional Units

U.S. Customary Units (English)	Inches Per Foot	Positional Units	Working Area (SF)
1' = 1'-0" (full-size)	12	96,000	3,728
6" = 1'-0" (half-size)	12	48,000	7,456
3" = 1'-0"	12	24,000	14,913
1 1/2" = 1'-0"	12	12,000	29,826
1" = 1'0"	**12**	**8,000**	**44,739**
3/4" = 1'-0"	12	6,000	59,652
1/2" = 1'0"	12	4,000	89,478
3/8" = 1'0"	12	3,000	119,304
1/4" = 1'0"	12	2,000	178,956
3/16" = 1'0"	12	1,500	238,609
1/8" = 1'0"	12	1,000	357,913
3/32" = 1'0"	12	750	477,218
1" = 10'	12	800	447,392
1" = 20'	12	400	894,784
1" = 40'	12	200	1,789,569
1" = 50'	12	160	2,236,962
1" = 80'	12	100	3,579,139
1" = 100'	12	80	4,473,924
1" = 200'	12	40	8,947,848
1" = 250'	12	32	11,184,810
1" = 400'	12	20	17,895,697
1" = 500'	12	16	22,369,621
1" = 1000'	12	8	44,739,242

CADD Design Standards Stationing

Plan Sheet stationing shall be based on 100-feet per station with full annotation at 500-foot stations (multiple of 5). Annotation at 100-foot stations in a single digit number (the ones column). Station annotation shall not include plus stations (i.e. =00).

Example of stationing:
.....9, 260, 1, 2, 3, 4, 265, 6, 7, 8, 9, 270, 1, ...

Stationing for Preliminary Drawings shall also be based on 100-feet per station and with full annotation at 500-foot stations for both: 1" = 200' and 1" = 400'. The 100-foot stations do not need to be annotated.

Stationing for identifying begin and end limits regarding items of work and offsets shall be shown to the hundredth of a foot.

The typical length of a station tick mark (in a MicroStation design file) is 2.8 feet at 1"=20', 7.0 feet at 1"=50' and 14.0 feet at 1"=100'. Station tick marks are centered on the alignment line. Annotation is placed below the alignment line.

Contour Intervals

For U.S. customary units, the index contour line will be every fifth contour and will be heavier weight than the intermediate contour lines. In metric units, the index contour lines were every fourth contour when using 1:200 and 1:500 scales.

In very steep terrain (at any scale), the intermediate contours may be eliminated if the contour lines are so close together affecting the readability of the mapping or plans.
See Table 2–1

Pavement cross slope and superelevation shall continue to be shown as a percent.

Angular measurement will retain the Degree-Minute-Second convention.

Dual units shall not be allowed on any Contract Plans.
All survey information will be expressed in English units.

Side slopes shall be expressed in a non-dimensional ratio. The horizontal component shall always be shown first and then the vertical component (X:Y). When a side slope becomes steeper than 1:1, the horizontal component shall be shown as a fraction (3/4:1).

Table 2–1

ENGLISH			METRIC		
Scale	Contours		Scale	Contours	
	Index	Intermediate		Index	Intermediate
1" = 20'	5 ft	1 ft	1:200	1 m	0.25 m
1" = 50'	10 ft	2 ft	1:500	2 m	0.50 m
1" = 100'	20 ft	4 ft	1:1000	5 m	1 m
1" = 200'	50 ft	10 ft	1:2000	10 m	2 m
1" = 400'	100 ft	20 ft	1:5000	25 m	5 m

Lines

Final Contract Plans involve a variety of line weights and line patterning to graphically provide the information needed to bid and construct a project. The line symbology developed for the Caltrans CADD system was intended to show various features with different symbology to easily distinguish them on a plan sheet, and to standardize the symbology for consistency.

More recently, line styles have been created which depict Caltrans standard line symbology, but allows an element to retain its geometry. The Caltrans standard resource file is "ctlstyle.rsc"

Line styles depict symbology for several functional units within Caltrans. For a listing containing Symbology for Photogrammetric Mapping and Construction Features, see Standard Plans A10C and A10D.

In the Amendment to the Standard Specifications it states that the written numbers and notes (callouts) on a drawing govern over graphics. Even though symbology is used to represent various design elements, the labeling or callout of a specific item takes precedence over the symbology of that item.

Line Weights

Line quality is extremely important to the readability of 11" x 17" Contract Plan Bid Documents. Line weights (width) are varied to distinguish certain classes of features from others. The more basic outlining features are emphasized with heavier (wider) lines (i.e., alignment lines, construction layout lines and basic outline of objects).

Medium-weight lines are used for proposed construction and Right of Way. Lightweight lines are used for existing topography, dimensioning and other less important details.

Weight	*Feature*	*Visibility of Line*
1	Object Lines	Dark, bold and sharp
0	Dimension Lines	Sharp, thin lines
0	Object Center Lines	Sharp, thin lines
1	Hidden Lines	Dark and sharp
0	Station Callout Lines	Dark, sharp and thin lines
1	Right of Way	Dark, sharp and bold
4	Sheet Borders	Heavy, dark and sharp
3*	Alignment lines for Main route(s)	Dark, bold and sharp
2*	Alignment Lines for Ramps and Local Streets	Dark, bold and sharp
1	Stationing for all Alignment Lines	Dark, bold and sharp

* Using varying line weights allows the main route alignment to be shown more prominently than secondary alignment lines, which in turn, allows secondary alignment lines to be shown more prominently than the proposed construction lines (edge of pavement, edge of shoulder, median barriers, etc). If the weight of an alignment line obscures or interferes with proposed construction lines, the weight of the alignment line may be reduced to provide greater clarity of the work to be performed.

Line Weights continued

Examples

Type of Line	*Sample*	*Weight*	*Description*
LC = 0	———	0	Dimension Lines, object centerlines and station callout lines. Interior horizontal lines (for rows) within a quantity table.
LC = 0	———	1	Edge of pavement, shoulders and gutters; obliteration; resurfacing; P.I. tangent lines and interior vertical lines (for columns) and framing lines within a quantity table. Various data including drainage facilities, object lines, hidden lines, various details, and R/W lines.
LC = 0	———	2	Alignment Lines for Ramps and Local Streets and miscellaneous uses.
LC = 0	———	3	Alignment Lines for Main Route(s). Borders of charts/ tables; profile grade line.
LC = 0	———	4	Sheet Borders.

Line Codes

Line codes (particularly the solid line, LC = 0) depict a recognizable symbology used for the majority of features shown on the contract plans. Line codes should not be confused with line styles or linear patterning.

There are eight standard line codes built into MicroStation. The seven dashed lines are symbolic and are not geographic, which means the view zoom or plot scale does not affect how it looks in the monitor or when printed out. This will not happen with line styles or linear patterning.

Line Code	*Sample*	*Definition*
0	———	Solid or continuous line - use for proposed design elements, objects (not hidden) and dimension lines.
1	.....	Dotted Line - sometimes used for existing features.
2	- - - - - - -	Short Dashed Line - sometimes used for existing features.
3	— — — — -	Long Dashed Line - used for depicting hidden details & existing non-structural features. Also used to show Fill (toe of slope).
4	— · — · — ·	Dash - Dot.
5	- - - - - - - -	Medium Dashed Line - used to show Cut (top of cut).
6	— · · — · · -	Dash-Dot-Dot - used to show existing structural features.
7	— - — - — -	Long Dash-Short Dash - used to show object centerlines.

Dashed Lines

Dashed lines sometimes represent existing information. Other times they allow for a different symbology to be used to graphically distinguish one item of work from another. Dashed lines may represent a variety of miscellaneous uses like easements, environmentally sensitive areas or various boundary lines. Dashed lines may be line codes, line styles or linear patterning. When dashed lines are used, they MUST be labeled for the specific use or the item it is graphically representing.

Line Styles and Linear Patterning

In most circumstances, line styles are replacing the need for linear patterning. Line styles allow the user to modify the line style directly while linear patterning requires the user to drop the pattern back to the original line/line string, modify the line/line string and then re-pattern it. Also, larger design files are created when linear patterning is used.

To place and display line styles, the individual workstation (computer) must have the line style resource file loaded on it. Line styles are not part of the design file, unlike linear patterning (cells). To plot line styles, the line style resource file must also be loaded on the plot server.

Caltrans roadway software (CAiCE) does not display line styles, as it is restricted to displaying just eight (8) different line codes. If there are more than eight (8) line styles in a design file, CAiCE then reuses and repeats the 8 line codes in an attempt to display the additional line styles.

When using line styles, CAiCE needs to use the positive ID value (line style code) of each line style. Every line style in the Caltrans Line Style resource file, "ctlstyle.rsc", has a positive ID value. When line styles are placed in CAiCE using the positive ID value and then exported to MicroStation, a translation table (mdgntype.tbl) is referenced and the appropriate line style is defined and displayed correctly in the MicroStation file.

Line Symbology

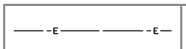
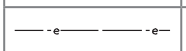
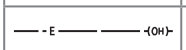
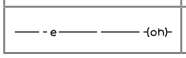
One major change that has occurred with line symbology concerns utilities. The current level convention standard for existing utilities is level 5, while level 40 is for proposed utilities. This standard still stands. But level 5 is a dropout level, prompting many districts to move existing utilities to a non-dropout level in order to make the existing utilities more legible on the final contract plans. To accommodate this desire for the districts, a symbology was needed to differentiate the proposed utilities from the existing. There are now two graphical distinctions between proposed and existing utilities.

The two differences are as follows:

1. Proposed utilities will have uppercase letters within the symbology of each utility while existing utilities will have lowercase letters.
2. Proposed utilities will be shown thicker (wider) than existing utilities. The suggested width of the utility lines is a weight of 3 for proposed and a weight of 1 for existing. Depending on the plotting scale and how crowded the contract plan sheet is, the widths can be adjusted to better show the information (such as a weight of 2 and a weight of 0). The important factor that must be graphically shown is the difference in width between the proposed and existing utilities (with the proposed utility always shown thicker).

The following table describes and shows some of the line symbology to be used to prepare Final Contract Plans with the CADD system.

Examples of Utility Symbology

	Underground electric line (Proposed)
	Underground electrical line (Existing)
	Overhead electrical line (Proposed)
	Overhead electrical line (Existing)

If, in the future, utility verification maps need to be plotted in color for the utility companies, the colors have been established. The line styles depicting utilities have been created to default to those established colors. A cell in the Caltrans Cell Library (CTCELLIB.cel) shows the proper color for the various utilities. The name of the cell is "aautil". The color yellow is not used because it is difficult to see when plotted and is not legible. The colors are as follows:

Color Number	*Color Value*	*Utility Type*
1	Blue	Water
2	Green	Gas
3	Red	Electrical
5	Purple	Telecommunications
6	Orange	Sewer
7	Brown	Oil

Note: The Caltrans standard color table "ctcolor.tbl" must be used for proper color values to be displayed.

CADD Line Patterns for Base Plan

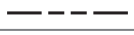
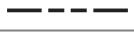
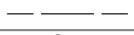
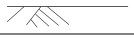
Planting and irrigation plans involve a variety of line patterns and line weights to graphically provide the information needed to construct a project. The following listing specifies the line symbology to be used to prepare planting and irrigation plans with the CADD system.

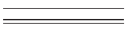
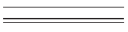
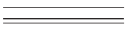
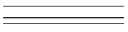
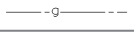
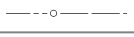
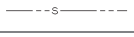
The CADD line symbology involves four pen sizes (CADD line weights) 0, 1, 2, and 3 and a number of different line patterns.

The line patterns as developed and stored in the system's pattern (CTCELLIB) library are generally for 50 scale drawings.

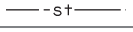
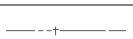
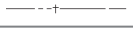
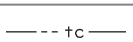
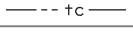
The first four lines shown are available on the menu but are not in the cell library. The remaining lines are part of the cell library (CTCELLIB). **Please note that when a pattern name is repeated for multiple uses, the user is required to set the correct weight before or after placing the pattern.**

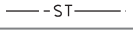
Caltrans Cell Library
(CTCELLIB.cel)

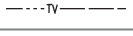
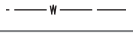
PROJECT PLANS				
Name	Description	Cell Type	Type of Use	Image
CITY	CITY LIMITS	Graphic	Line Pattern	
COUNTY	COUNTY LIMITS	Graphic	Line Pattern	
STATE	STATE BOUNDARY LIMITS	Graphic	Line Pattern	
FOREST	FOREST BOUNDARY LIMITS	Graphic	Line Pattern	
CL	CENTERLINE TXT SYMBOL	Point	Notes	
FLOWLN	DRAINAGE FLOW LINE PATTERN	Point	Line Pattern	
OG	ORIGINAL GROUND SYMBOL	Point	Line Pattern	

ROADWAY				
Name	Description	Cell Type	Type of Use	Image
CLINE	CENTERLINE FOR IGRDS	Point	Line Pattern	
A2_150	CURB TYPE A2_150	Graphic	Line Pattern	
A2_200	CURB TYPE A2_200	Graphic	Line Pattern	
B2CURB	CURB TYPE B2	Graphic	Line Pattern	
B4CURB	CURB TYPE B4	Graphic	Line Pattern	
TYPE_E	CURB TYPE E	Graphic	Line Pattern	
CONCRP	NEW CONCRETE BARRIER PATTERN	Graphic	Line Pattern	
FENP	FENCE PATTERN	Graphic	Line Pattern	
NWALLP	NEW WALL PATTERN	Graphic	Line Pattern	
WFP	RETAINING WALL FENCE	Graphic	Line Pattern	
EXGRP	EXIST GUARDRAIL PATTERN	Point	Line Pattern	
GDRP	GUARDRAIL PATTERN	Graphic	Line Pattern	
MBGR	NEW GUARDRAIL PATTERN	Graphic	Line Pattern	
DBLBAR	DOUBLE BEAM BARRIER PATTERN	Graphic	Line Pattern	
EXNG	EXIST NATURAL GAS	Graphic	Line Pattern	
EXO	EXIST OIL	Graphic	Line Pattern	
EXS	EXIST SEWER	Graphic	Line Pattern	

CADD Line Patterns for Base Plan continued

ROADWAY continued				
Name	Description	Cell Type	Type of Use	Image
EXSTEM	EXIST STEAM	Graphic	Line Pattern	
EXT	EXIST TELEPHONE	Graphic	Line Pattern	
EXTELC	EXIST TELECOMMUNICATION	Graphic	Line Pattern	
EXTV	EXIST TELEVISION	Graphic	Line Pattern	
EXW	EXIST WATER	Graphic	Line Pattern	
GASOLN	GASOLINE UTIL PATTERN	Graphic	Line Pattern	
NATGAP	UTIL UG GASOLINE PATRN	Graphic	Line Pattern	
OILP	OIL UTIL PATTERN	Graphic	Line Pattern	
SEWERP	SEWER UTIL PATTERN	Graphic	Line Pattern	
STEAM	STEAM UTIL PATTERN	Graphic	Line Pattern	
TELCOM	TELECOMM UTIL PATTERN	Graphic	Line Pattern	
TELEP	TELEPHONE UTIL PATTERN	Graphic	Line Pattern	
TVP	TEVEVISION UTIL PATTERN	Graphic	Line Pattern	
WATERP	WATER UTIL PATTERN	Graphic	Line Pattern	
WATP	WATER PATTERN	Graphic	Line Pattern	

RIGHT OF WAY				
Name	Description	Cell Type	Type of Use	Image
NATIM	NEW ACCESS TIC INSIDE	Point	Line Pattern	
NATOM	NEW ACCESS TIC OUTSIDE	Point	Line Pattern	

TRAFFIC				
Name	Description	Cell Type	Type of Use	Image
ECC	EXIST COMMUNICATION CONDUIT	Graphic	Line Pattern	
EFAC	EXISTING FIRE ALARM CONDUIT	Graphic	Line Pattern	
EFIBOP	EXIST FIBER OPTIC	Graphic	Line Pattern	
ETC	EXIST TELEPHONE CONDUIT	Graphic	Line Pattern	
NCC	NEW COMMUNICATION CONDUIT	Graphic	Line Pattern	
NFAC	NEW FIRE ALARM CONDUIT	Graphic	Line Pattern	
NFIBOP	NEW FIBER OPTIC	Graphic	Line Pattern	
NOHL	NEW OVER HEAD LINE	Graphic	Line Pattern	

Text

Text requirements for notes, dimensions, titles, and headings used for project plan sheets have been consolidated and standardized for CADD use. **With the implementation of MicroStation J, Caltrans has created a new font, which will be the standard.** The new font is called "CTFONT1", which has a numerical value of 3. CTFONT1 is a replication of the previous standard font, "LEROY", but with modifications to the kerning (space for each letter) of some letters. Additional characters were added to both CTFONT1 and LEROY. The LEROY font will still be used for mapping purposes.

Text Size - Highway & Landscape Project Plans

In the Caltrans CADD system, all Highway and Landscape drawings are created at one "Design Plane" size of 429,496 square feet. Plans are developed at a ratio of 1 to 1, but can be plotted at any desired scale. Text sizes were determined based on how the text looked within the border sheet and what information should be shown more prominently. The size for the text listed in the table below, is based on a plotting scale of 1:500 (Caltrans Base Scale). It is important to place text at the appropriate CADD size within the drawing based on the intended scale of the plotted plan sheet.

The following table defines the text sizes to be used for Highway and Landscape project plan sheets:

Description	*English Size* [1]	*Font*	*Weight*
Title Project Description.	TX = 14.5	43	0
Name and ID Code of Individual Plan Sheets, (does not apply to the Title Sheet).	TX = 14.5 [2]	43	0
Titles for Quantity Tables and Detail Drawings.	TX = 12	43	0
Country and State boundary.	TX = 11	43	0
City Names on the Title Sheet Strip Map & Counties [6].	TX = 10	43	0
Begin and End Work on Title Sheet. Titles for Informational Tables.	TX = 10	3	2
Subtitles for Tables and Detail Drawings. Route and Route No. Headings in Quantity of Summary.	TH = 8.75 TW = 8.75 [3]	3	2
As-Built changes	TX = 8.75	3 [4]	2
River Names (Water Ways).	TX = 7	3 [5]	1
Majority of Text, (including text with drawings, tables and dimensioning.)	TX = 7	3	1
Restricted Space for Placement of Text.	TH = 7 TW = 6	3	0
Title and Plan Border Name Blocks Names of Persons Involved	TX = 7	3	1
Photogrammetric Mapping Text	TX = 6	2	1

1 TX = represents height (TH) and width (TW) in **feet** for Caltrans standard 1" = 50' drawings.
2 Adjustable if necessary (TX = 12 minimum).
3 Reduce text width (TW = 7 minimum), if needed for restricted space.
4 Place at a slant angle of 15 degrees.
5 **Do not use Font 23.** It is obsolete and does not have the appropriate spacing for characters or the desired appearance for certain letters. Use Caltrans standard Font 3 (CTFONT1) with a slant angle of 25 degrees instead.
6 Counties may be identified on the Title sheet when the project is located in more than one county (i.e., various locations). When counties are shown on the Title sheets, the text size and font for cities should be reduced to TX 8.75, Font 3 and WT 2, so the counties can be shown more prominently than cities.

Option: If a plan sheet has **multiple routes** and is a busy and cluttered sheet, making it difficult to see the route labeling, then the Route and Route No. may be placed using a text size of (TX = 10, Font = 43, WT = 0) if space allows.

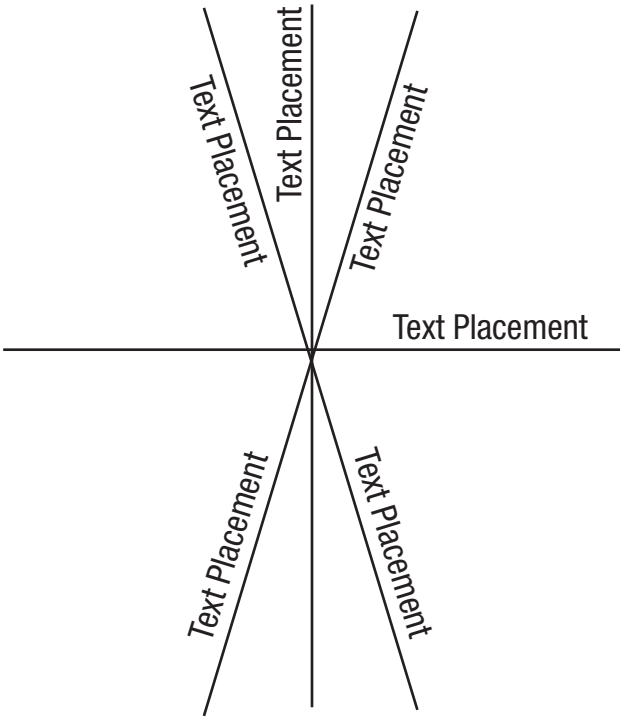
For title sheets having a strip map that covers a large area, the route identification may be placed using a text size of (TX 10, WT 2) but still using Font 3.

Text Size at Various Scales

U.S. Customary Units (English)	*Inches Per Foot*	*Positional Units*	*Text Size*
1’ = 1’-0” (full-size)	12	96,000	0.0100
6” = 1’-0” (half-size)	12	48,000	0.0200
3” = 1’-0”	12	24,000	0.0400
1 1/2” = 1’-0”	12	12,000	0.0800
1” = 1’0”	**12**	**8,000**	**0.1200**
3/4” = 1’-0”	12	6,000	0.1600
1/2” = 1’0”	12	4,000	0.2400
3/8” = 1’0”	12	3,000	0.3200
1/4” = 1’0”	12	2,000	0.4800
3/16” = 1’0”	12	1,500	0.6400
1/8” = 1’0”	12	1,000	0.9600
3/32” = 1’0”	12	750	1.2800
1” = 10’	12	800	1.2000
1” = 20’	12	400	2.4000
1” = 40’	12	200	4.8000
1” = 50’	12	160	6.0000
1” = 80’	12	100	9.6000
1” = 100’	12	80	12.0000
1” = 200’	12	40	24.0000
1” = 250’	12	32	30.0000
1” = 400’	12	20	48.0000
1” = 500’	12	16	60.0000
1” = 1000’	12	8	120.0000

NOTE: The text size shown in the table above is for informational notes.

Text Placement



USE 9 DEGREE RULE FOR PLACING TEXT ON MATCH LINES AND STREET CROSSINGS.

General Plan Requirements

Highway planting projects should include a complete set of plans with all appropriate information for the purpose of bidding and building the project. This includes, but is not limited to:

- Providing sufficient details for items not covered by the Standard Plans.
- Ensuring terminology used on the plans matches item descriptions in the estimate and special provisions.
- Properly identifying high and low risk utility facilities, and ensuring plans conform to all existing standards.

Plans produced by the Landscape Architect for Highway Construction projects (planting, irrigation or erosion control work performed with Highway Construction projects) would not include title sheet and construction area signs plans developed by a Landscape Architect. The Landscape Architect or consultant is to submit the appropriate plans for planting, irrigation or erosion control work to the Project Engineer for insertion into the plan package.

Caltrans Drafting Conventions

Proficient drafting gives a well-engineered project the look and feel of a quality product. It can enhance and clarify the readability of the contract plans. A perfectly engineered project is only perfect if it can be easily read and understood by the bidders, winning Contractor and the construction inspector. While developing the project, the designer must always keep in mind the people who will read and interpret the plans (the plans are not for the designer or spec-engineer).

A quality project can be defined as a "complete set of contract plans that clearly identifies all items of work that a competent Contractor can easily interpret and build."

Simplicity and consistency are two of the important aspects of good drafting practices. Rules/guidelines for improving drafting practices that will enhance and clarify a project advertised by Caltrans include such things as:

- Eliminate extraneous information NOT directly related to that specific plan sheet. *Too often plan sheets are cluttered with excess topography causing important proposed design features to be overshadowed and leaving no space for pertinent related callouts identifying the items of work.*

- Background topography should not generally be shown outside the Right of Way (R/W) unless the design of the project (or specific sheet) requires it. *Information shown outside of the R/W can infer that work will be necessary outside the R/W when that is not the case. Just because the information exists in the base mapping of the project, doesn't mean it should be shown on every plan sheet.*

- Items of work identified on plan sheets must be called out (labeled) exactly the same as it appears in the quantity tables, engineer's estimate and special provisions.

- Quantities should be easy to identify, calculate and locate for all items of work. Plus stations are used to identify the "begin and end" of an item of work. All plan sheets shall show alignment lines so offset distances can be identified by its known reference. Minor projects, designed using only Post Miles (PM) in place of stationing, shall identify locations to the tenth of a Post Mile.

- The plotting scale on all contact plan sheets is for convenience purposes only. There are only three acceptable scales for plan or profile sheets: 1" = 20', 1" = 50' and 1" = 100'

- Sheets such as detail sheets shall be labeled with "No Scale."

- Expecting a bidder or Contractor to scale from a hard copy print of any contract plan sheet to determine a quantity SHALL NEVER be a requirement. All items of work shall be clearly identified so quantities can be determined from the labeling and dimensioning on plan, profile or detail sheets. How quantities are identified and labeled in a quantity table shall be consistent with how they are identified and labeled on the plan, profile or detail sheet.

- If the quantity for the same item of work is shown on more than one quantity table, the sub-totals from each quantity table plus a grand total must be shown on the quantity table most logically associated with that item of work.

- Line weights, line styles and graphical representations of features must conform to the CADD Users Manual, Plans Preparation Manual and the Standard Plans.

- Abbreviations, Symbols and Symbology must conform to the Standard Plans A10A through A10D, H1 and H2 and ES-1A through ES-1C.

- Text size must conform to the CADD Users Manual. Placement of text should be consistent and legible throughout the project. When looking at a plan sheet, the alignment of text should easily be read from left to right or bottom to top.

- Text should be placed above or below the line work if leaders and arrowheads are not used. Placement of text should not break line work or shapes.

- Be consistent with the use of leaders and arrowheads.

- Match lines should be perpendicular to the alignment line and located halfway between station tick marks (i.e. +50).

- Placement of symbols, notes or disclaimer information should be consistently located at the same location on plan sheets within a project and at the same location for all projects.

- Dimensions in feet and inches shall be shown with a single quote mark for feet and a double quote mark for inches.

- All projects must have at least two sheets (a title sheet and one other showing proposed work). The layouts are the base plan sheets and all plan sheet information can be shown on them. If the layouts become too crowded or cluttered, other plan sheets should be used to clearly show the proposed work (i.e. drainage, utilities, signing, striping, etc).

- The fewer and simpler the sheets, the more clear, concise and understandable the final plans will be.

- Some projects do not need layouts to show the proposed work. If the detail and quantity sheets (along with the special provisions) can clearly and concisely show and explain the proposed work, then layouts (or any other plan sheets) may not be necessary.

- Group similar or inter-related items of work on the same plan sheets (i.e. signing and striping). Avoid one item of work on one type of plan sheet if it can easily be combined on another similar type plan sheet (unless the sheet is too crowded or cluttered).

- Level Symbology is NOT a substitute for adhering to Caltrans standards. Level Symbology re-defines attributes (color, style and weight) of elements on selected levels for clarity of viewing a design file on the monitor.

Drawing Codes - Highway Planting Projects

Sheet Names, Plan Sheet ID, Print Sequence Code & Sheet Cell Name

A set of Highway Planting plans may contain a few or all of the following sheets. The sheet name and Plan Sheet ID are required on every sheet, except the Title Sheet. The sheet name should be placed inside the sheet border at the lower right-hand corner of each sheet. Plan sheet identification codes and names (if applicable) for Highway Planting Projects are listed below and should be **arranged in the following order:**

Sheet Names	*Plan Sheet ID*[1]	*Print Seq. Code*[2]	*Sheet Cell Name*[3]
Title	-	ta	LAND[4]
Key Map[5]	K -	tb	LAND[4]
Temporary Water Pollution Control Plan (*With or without details or quantities*)[5]	WPC -	tc	LAND[4]
Temporary Water Pollution Control Details (*With or without quantities*)[5]	WPCD -	tc	LAND[4]
Temporary Water Pollution Control Quantities[5]	WPCQ -	tc	LAND[4]
Erosion Control Plan (*With or without details or quantities*)[5]	EC -	td	LAND[4]
Erosion Control Details (With or without quantities)[5]	ECD -	td	LAND[4]
Erosion Control Quantities[5]	ECQ -	td	LAND[4]
Plant List	PL -	te	PLTLST
Plant Removal Plan[5]	PR -	tf	LAND[4]
Roadside Clearing Plan[5]	RC -	tg	LAND[4]
Maintain Existing Plants Plan[5]	MA -	th	LAND[4]
Planting Plan	PP -	ti	LAND[4]
Irrigation Removal Plan[5]	IR -	tk	LAND[4]
Irrigation Plan	IP -	tl	LAND[4]
Planting And Irrigation Plan	PI -	tm	LAND[4]
Landscape Details *(Use this sheet for details and the Sprinkler Schedule).*	LD -	tn	LAND[4]
Irrigation Quantities	IQ -	to	IQ - 1 & IQ - 2
Existing Irrigation Plan[5]	EI -	tp	LAND[4]
Existing Utilities Plan[5]	EU -	tq	LAND[4]
Electrical Service (Irrigation) Plan[6]	E	tr	-
Traffic Handling Plan (*With of without details or quantities*)	TH	ts	**These sheets are provided by others**
Traffic Handling Details (*With of without quantities*)	THD	ts	
Traffic Handling Quantities	THQ	ts	
Construction Area Signs	CS	tt	
Booster Pump (Electrical)	EE	tu	
Booster Pump (Mechanical Electrical)	ME	tv	
Booster Pump (Mechanical)	M	tw	
Signal, Lighting and Electrical Systems Plan and Details	E	ua	
Revised Standard Plan[6]		va	
New Standard Plan[6]		vb	

1 Print Sequence Code (formerly known as CADD Alpha Code) within the electronic name of the file. This will facilitate the plotting of plan sheets in the correct sequence.

2 A sheet number is to follow the dash after the code letter, i.e., P-1, P-2.

3 CADD cell library (CTCELLIB) file name of sheet used.

4 Blank base sheet with the border and landscape architect signature block.

5 Optional plan sheets. On occasion, a designer may want to have an additional set of plan sheets to show certain types of work more clearly (i.e., Key Map, Erosion Control, and Plant Removal).

6 Refers to Standard Plan Sheets issued by DES-Office of Office Engineer.

Drawing Codes - Highway Construction Projects

Sheet Names, Plan Sheet ID & Print Sequence Code

Sheet Names	*Plan Sheet ID*	*Print Seq. Code*
Title	-	ab
Locations of Construction	LC	ba
Typical Cross Sections	X	ca
Key Map & Line Index	K	da
Aerial Identification	A	db
Project Control	PC	dc
Layout (*With or without profile shown or with or without superelevation diagram shown*)	L	ea
Profile (Without superelevation diagram shown)	P	fa
Profile and Superelevation Diagram	PS	fb
Superelevation Diagram	SE	fb
Construction Details	C	ga
Temporary Water Pollution Control Plan (*With or without details or quantities*)	WPC	gb
Temporary Water Pollution Control Details (*With or without quantities*)	WPCD	gc
Temporary Water Pollution Control Quantities	WPCQ	gd
Erosion Control Plan (*With or without details or quantities*)	EC	ge
Erosion Control Details (*With or without details or quantities*)	ECD	gf
Erosion Control Quantities	ECQ	gh
Contour Grading	G	ha
Drainage Plan	D	ia
Drainage Profiles	DP	ib
Drainage Details	DD	ic
Drainage Quantities	DQ	id
Sanitary Sewer Plan	SS	ja
Sanitary Sewer Profiles	SSP	jb
Sanitary Sewer Details	SSD	jc
Sanitary Sewer Quantities	SSQ	jd
Utility Plan *(With or without details or quantities)*	U	ka
Utility Details *(With or without quantities)*	UD	kb
Utility Quantities	UQ	kc
Construction Area Signs	CS	la
Motorist Information Plan (*With or without details or quantities*)	MI	lb

Sheet Names	*Plan Sheet ID*	*Print Seq. Code*
Motorist Information Details *(With or without quantities)*	MID	lc
Motorist Information Quantities	MIQ	ld
Stage Construction *(With or without Traffic Handling Plan; With or without Detour Plan; With or without details or quantities)*	SC	ma
Stage Construction Details *(With or without quantities)*	SCD	mb
Stage Construction Quantities	SCQ	mc
Traffic Handling Plan *(When not included on SC sheet; With or without details or quantities)*	TH	md
Traffic Handling Details *(With or without quantities)*	THD	me
Traffic Handling Quantities	THQ	mf
Detour Plan *(When not included on SC or TH sheet; With or without quantities)*	DE	mg
Detour Quantities	DEQ	mh
Pavement Delineation Plan	PD	na
Pavement Delineation Details	PDD	nb
Detour Plan *(When not included on SC or TH sheet; With or without quantities)*	DE	mg
Detour Quantities	DEQ	mh
Pavement Delineation Plan	PD	na
Pavement Delineation Details	PDD	nb
Pavement Delineation Quantities	PDQ	nc
Sign Plan	S	oa
Sign Details	SD	ob
Sign Quantities	SQ	oc
Summary of Quantities	Q	pa
Retaining Wall Plan, Elevation, Typical Section, Details, Quantities and Log of Test Boring **For 1st Retaining Wall** (*All information pertaining to the 1st wall is to be grouped together before the next wall. The typical, details and quantities can be placed on the plan (if room allows) or on their own sheets or in combination*)	R	qa
Retaining Wall Typical Section (1st wall)	R	qa
Retaining Wall Details (1st wall)	R	qa

Sheet Names	*Plan Sheet ID*	*Print Seq. Code*
Retaining Wall Quantities (1st wall)	R	qa
Log of Test Boring (1st wall)	R	qa
Retaining Wall Plan, Elevation, Typical Section, Details, Quantities and Log of Test Boring **For 2nd Retaining Wall** (*Information which pertains to more than 1 wall, such as details or log of test boring, can be shown with the 1st wall, and a reference made to that 1st wall on subsequent walls*)	R	qa
Retaining Wall Typical Section (2nd wall)	R	qb
Retaining Wall Details (2nd wall)	R	qb
Retaining Wall Quantities (2nd wall)	R	qb
Log of Test Boring (2nd wall)	R	qb
CADD Alpha Code for all subsequent walls will be "qc" through "qz" (26 walls). For more than 26 walls in one project, contact HQ-MicroStation support.		
Sound Wall Plan, Elevation, Typical Section, Details, Quantities and Log of Test Boring **For 1st Sound Wall** (*All information pertaining to the 1st wall is to be grouped together before the next wall. The typical, details and quantities can be placed on the plan (if room allows) or on their own sheets or in combination*)	SW	ra
Sound Wall Typical Section (1st wall)	SW	ra
Sound Wall Details (1st wall)	SW	ra
Sound Wall Quantities (1st wall)	SW	ra
Log of Test Boring (1st wall)	SW	ra
Sound Wall Plan, Elevation, Typical Section, Details, Quantities and Log of Test Boring **For 2nd Sound Wall** *(Information which pertains to more than 1 wall, such as details or log of test boring, can be shown with the 1st wall, and a reference made to that 1st wall on subsequent walls*)	SW	rb
Sound Wall Typical Section (2nd wall)	SW	rb
Sound Wall Details (2nd wall)	SW	rb
Sound Wall Quantities (2nd wall)	SW	rb
Log of Test Boring (2nd wall)	SW	rb
CADD Alpha Code for all subsequent walls will be "qc" through "qz" (26 walls). For more than 26 walls in one project, contact HQ-MicroStation support.		
Roadside Rest Plan	RSR	sa

Sheet Names	*Plan Sheet ID*	*Print Seq. Code*
Plant List	PL	te
Plant Removal Plan	PR	tf
Roadside Clearing Plan	RC	tg
Maintain Existing Plants Plan	MA	th
Planting Plan	PP	ti
Irrigation Removal Plan	IR	tk
Irrigation Plan	IP	tl
Planting and Irrigation Plan	PI	tm
Landscape Details *(Use this sheet for details and the Sprinkler Schedule)*	LD	tn
Existing Irrigation Plan	EI	tp
Existing Utilities Plan	EU	tq
Electrical Service (Irrigation) Plan	E	tr
Booster Pump (Electrical)	EE	tu
Booster Pump (Mechanical Electrical)	ME	tv
Booster Pump (Mechanical)	M	tw
Signal, Lighting and Electrical Systems Plan and Details	E	ua
Revised Standard Plan	-	va
New Standard Plan	-	vb
General Plan	GP	wa
Architectural Plan	A	wb
Structural Plan	ST	wc
Electrical Plan	M	wd
Mechanical Plan	EE	we
Sanitary Plan	SS	wf

NOTE 1

Print Sequence Codes should not utilize the same letter twice (example – "aa" or "gg" but the one exception is "tt", which is for Electrical Service (Irrigation) Plan). If this happens, it may be confused with the CADD Alpha Code within the naming convention for mapping and preliminary drawings (Also see Section 2.1 D of the CADD Users Manual).

NOTE 2

Highway Planting sheets (that are part of a Highway project) will no longer have HP as the Sheet ID. See the above table for the proper plan sheet ID's to use.
When landscaping work is part of a Highway project, some sheets will already exist within the Highway portion, making it unnecessary to have those sheets within the Landscape portion as well. Some items of work should appear on the existing Highway sheets and not on the Landscape sheets (examples: utilities and electrical).

NOTE 3

Each Retaining Wall or Sound Wall will have a different Print Sequence Code for each wall. The plan sheet(s) for each wall may contain all the information pertaining to that wall (except the Log of Test boring information). Separate sheets are allowed for typical sections, details and quantities when needed for clarity.
The total quantities for all Retaining Walls or Sound Walls must be shown with the Summary of Quantities.

NOTE 4

Each unique Print Sequence Code will end with the number "001".
Example: "412345ia001" "412345ic001" "412345id001"
This will allow the Print Sequence Code number to be identical to the Sheet ID number. The exceptions will be Retaining Wall, Sound Wall and Signal, Lighting and Electrical Systems Plan and Details sheets.

Mapping & Preliminary Drawings

Mapping and preliminary CADD prepared drawings require a naming convention (CADD Alpha Code) in the electronic name of the file. This allows for easy identification of the type of drawing file it is. The CADD Alpha Code system utilized by Photogrammetry and Design are shown in the following table for mapping and preliminary drawings.

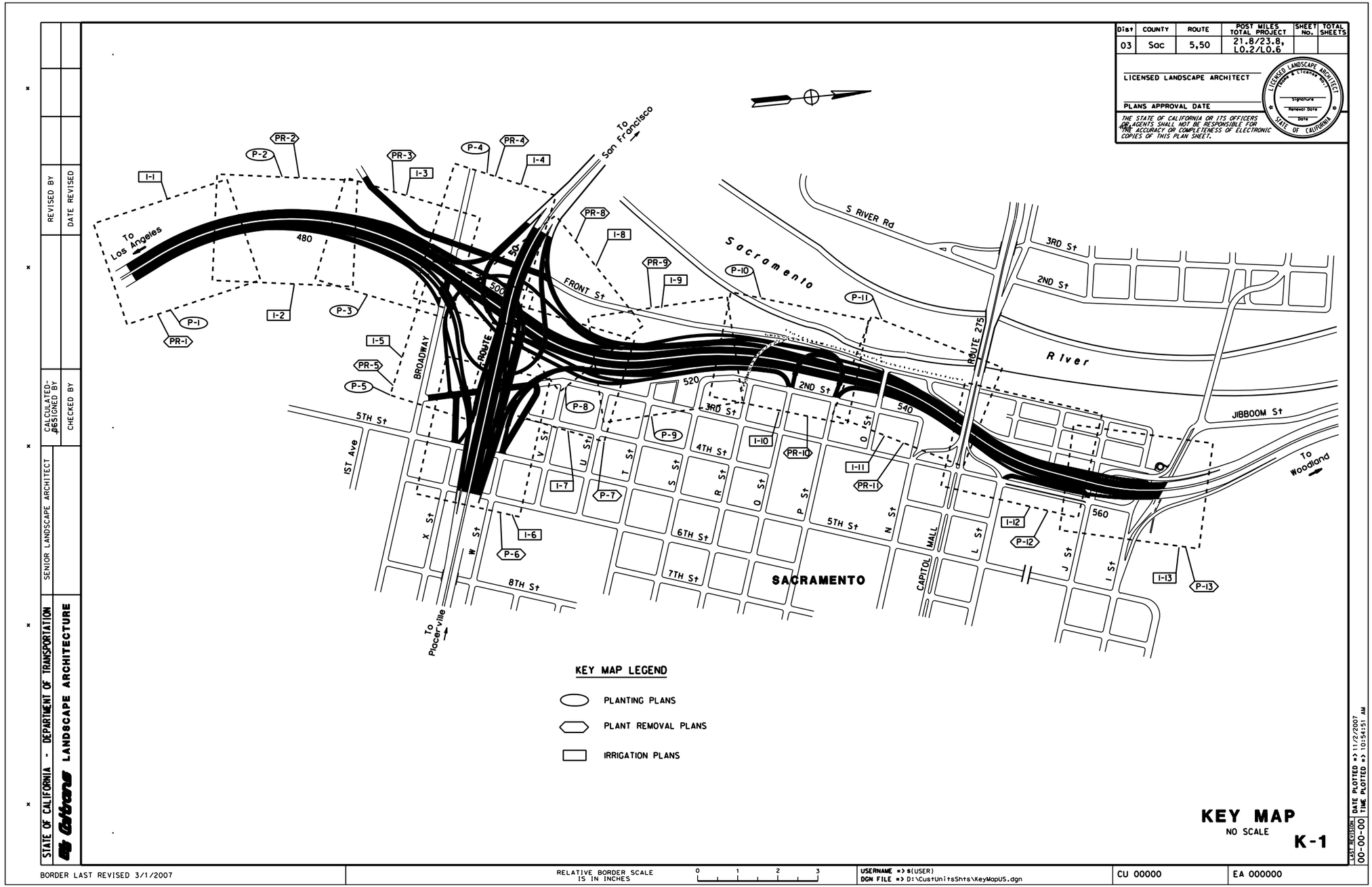
Drawing Name	*CADD Alpha Code*
Master Design Files	aa
Master Topographic Files	bb
3D Terrain Data	3d
Scanned Drawings	cc
Digitized Drawings	dd
Created Drawings	ee
Project File Directory	ff
Route Adoption Map	gg
Area of Interest Map	hh
Strip Map	ii
Freeway Agreement Map	jj
New Connection Report Exhibit	kk
PUC Exhibit (A, B, C etc.)	ll
Geometric Approval Drawing	mm
Bridge Site Map	nn

Key Map Sheet

A key map sheet may be required on large and complex projects. This sheet is an aid to clarify sheet locations and arrangements of centerlines. It is a small-scale graphic line diagram showing construction layout lines, sheet arrangements, and centerlines. The same strip map for the title sheet can be used. The scale can be adjusted to fit the sheet. *See page 2-25 for example of a **Key Map Sheet**.*

It is preferred by DES-OE that key maps not be placed on each individual plan sheet. The reason for this is that too many projects have had incorrect Key Maps.

Key Map


Dist 03 | COUNTY Sac | ROUTE 5,50 | POST MILES TOTAL PROJECT 21.8/23.8, L0.2/L0.6 | SHEET No. | TOTAL SHEETS
LICENSED LANDSCAPE ARCHITECT
PLANS APPROVAL DATE
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.
LICENSED LANDSCAPE ARCHITECT
Signature
Renewal Date
Date
STATE OF CALIFORNIA
REVISED BY
DATE REVISED
CALCULATED-DESIGNED BY
CHECKED BY
SENIOR LANDSCAPE ARCHITECT
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans LANDSCAPE ARCHITECTURE
To Los Angeles
480
To San Francisco
50
Sacramento
S RIVER Rd
3RD St
2ND St
FRONT St
ROUTE 275
River
JIBBOOM St
To Woodland
BROADWAY
ROUTE 160
5TH St
4TH St
6TH St
7TH St
8TH St
SACRAMENTO
CAPITOL MALL
520
540
560
I ST
J St
L St
N St
P St
O St
R St
S St
T St
U St
V St
W St
X St
IST Ave
To Placerville
I-1
I-2
I-3
I-4
I-5
I-6
I-7
I-8
I-9
I-10
I-11
I-12
I-13
P-1
P-2
P-3
P-4
P-5
P-6
P-7
P-8
P-9
P-10
P-11
P-12
P-13
PR-1
PR-2
PR-3
PR-4
PR-5
PR-8
PR-9
PR-10
PR-11
KEY MAP LEGEND
PLANTING PLANS
PLANT REMOVAL PLANS
IRRIGATION PLANS
KEY MAP
NO SCALE
K-1
LAST REVISION 00-00-00
DATE PLOTTED => 11/2/2007
TIME PLOTTED => 10:54:51 AM
BORDER LAST REVISED 3/1/2007
RELATIVE BORDER SCALE IS IN INCHES
0 1 2 3
USERNAME => $(USER)
DGN FILE => D:\CustUnitsShts\KeyMapUS.dgn
CU 00000
EA 000000

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Standard Plans

At the time of PS&E submittal to District Office Engineer, SSP StDPln "Standard Plans List", must be included indicating those standard plans that are applicable to the project.

Revised Standard Plans (RSPs) and New Standard Plans (NSPs) must be indicated in the SSP StDPln "Standard Plans List", and included in the project plans. The Headquarters Office Engineer will list these RSPs and NSPs on the "Index of Sheets" of the Title Sheet of the project plans.

See Section 9 of this manual for the most often used standard plans for Highway Planting projects.

Standard Abbreviations

Standard abbreviations have been developed which are used on project plans and details.

There are two abbreviations lists generally used on Highway Planting projects by Landscape Architects. They are standard plans:

A10A & A10B – ACRONYMS AND ABBREVIATIONS
HI - PLANTING AND IRRIGATION ABBREVIATIONS

To use the Standard Plans ACRONYMS AND ABBREVIATIONS A10A and A10B and PLANTING AND IRRIGATION ABBREVIATIONS H1, edit SSP StDPln "Standard Plans List".

The abbreviations are to be used as shown. **Do not add periods after the abbreviations**.

Any abbreviations added to the plans that are not on one of the above lists must be added to the plans in a legend.

See Section 9 - Standard Plans for a copy of the above referenced abbreviation sheets.

Other Standard Abbreviations

Work done by other disciplines on a project may have other additional standard abbreviations. For example, Electrical Engineers doing details and wiring diagrams on plans, will most likely use additional standard abbreviations. Electrical work has two Standard Plans, ES-IA and ES-IB, titled SIGNAL, LIGHTING AND ELECTRICAL SYSTEMS - SYMBOLS AND ABBREVIATIONS. To use these plans, edit SSP StDPln "Standard Plans List".

Consult the other disciplines that are working on the project for the standard plans that apply to the project.

Project Plan Sheet Signatures

Each plan sheet shall have ONE license seal and signature of the lowest classification, licensed person knowledgeable and in responsible charge for developing that plan.

The title sheet shall have ONE license seal and signature of the lowest classification, licensed person knowledgeable and in responsible charge for developing the entire project.

Title and Plan Border Name Blocks

The title sheet include a name block for the Senior Landscape Architect or Senior Design Engineer and Project Manager in the left margin for the printed name of the individual providing oversight of the project landscape architect or engineer in responsible charge of the entire project.

The plan sheet includes a name block in the left margin for the printed name of the person in the functional unit responsible for providing oversight of the registered professional who developed the plan sheet, printed name of the person who calculated or designed the information on that particular sheet, and the name of the person who performed quality control of the design features and/or quantities on that sheet.

The printed initials of the person responsible for a revision on any specific sheet shall also be included with the month, day, and year for any design or quantity revision.

Effective July 1, 2007, all Plans, Specifications and Estimate (PS&E) submittals to Division of Engineering Services – Office Engineer, AADD projects, and consultant or local agency projects on the State Highway System, shall use and fill out the left margin of the latest Title and Plan Border sheets.

Project Plan Sheet Signatures on As-Builts

If AS-BUILT plans are to be part of the project plans, the original seal and signature shall be left on the plans. No new signature block is required. However, a note, "FOR REFERENCE ONLY" **must** be added to each sheet.

Existing Utilities

Existing utilities must be shown on the plans with the appropriate symbol, size, and abbreviation. *See Section 9 - Standard Plan Sheet A10B for appropriate symbols.*

Drawing File Names - Naming Convention

Description

The "File Name" is a unique identification for each drawing. This unique "File Name" allows for the search of a drawing by DISTRICT & EXPENDITURE AUTHORIZATION (EA) (also used as the contract number). For highway and landscape plans, the file name is 11 characters long, combining both alpha and numeric characters. For Structures drawings, the file name length varies with the type of sheet, and also combines both alpha and numeric characters. The windows operating system is case-aware, not case-sensitive, but the preference is lower case lettering for the file names of all contract plan sheets.

Need for Naming Uniformity

- Without a uniform naming convention, it is impossible to keep the system free of duplicate files, which could eventually use up a significant amount of system storage.
- Transfer of project files (design files), from district to district requires the use of a uniform naming convention to avoid repetitious explanations, misinterpretations, and additional record keeping.
- As with most records at Caltrans, the basis of the naming convention is the district/expenditure authorization. This facilitates the design files to be project specific. The use of a uniform naming convention allows for quick searches for design files, whether on current files or archived files.
- The Print Sequence Code (formerly known as CADD Alpha Code), which is part of the naming convention, automates the plotting of the contract plan sheets in the standard specified order.

District Codes

A district code is to be included in every drawing name. These codes are as follows:

District	*Code*
Districts 1-9	1-9, respectively
District 10	a
District 11	b
District 12	c
CADD & Engineering GIS Support	e
ESC OET, Geometronics Branch	g
ISSC Information Services	k
HQ Office of Landscape Architecture	l
ESC Office of Office Engineer	p
ESC OET, Geometronics Branch (R/W Engineering)	r
HQ Division of Traffic Operations	t

The Office of CADD & Engineering GIS Support will assign additional codes as necessary.

Highway Planting Project

When Highway Planting is a separate project (not part of a Highway Construction project), additional Print Sequence Codes will be used (see 2-21 Highway Planting Projects). Highway Construction sheets, which need to be included in a Highway Planting project (i.e., Title Sheet), will have a different Print Sequence Code than when they are included in a Highway Construction project but the Sheet ID will remain the same. All Highway Planting sheets shall be named in accordance with the following naming convention:

d12345ppXXX		
d	=	District code (same as Roadway).
12345	=	First 5 numerals of project expenditure authorization.
pp	=	Print Sequence Code.
XXX	=	Respective sheet numbers for each Print Sequence Code used in the project.

Highway Planting Project continued

Example 1:

712345te002		
7	=	District 7.
12345	=	First 5 numerals of project expenditure authorization.
te	=	Print Sequence Code (Plant List).
002	=	Sheet number (2nd Plant List sheet).

Highway Construction Project

All Highway Construction Projects (Roadway) shall be named in accordance with the following naming convention:

d12345ppXXX		
d	=	District code. The district code represents the district where the project is being constructed, (not the district creating the CADD drawings). Districts 1-9 use a single numeric character (1-9 respectively). Districts 10 through 12 use a single alpha character (a-c respectively).
12345	=	First 5 characters of the project expenditure authorization.
pp	=	Print Sequence Code (2 alpha characters).
XXX	=	Respective sheet numbers (numerical characters) for each Print Sequence Code used in the project.

Example 1:

512121ic007.dgn		
5	=	District 05.
12121	=	First 5 characters of the project expenditure authorization.
ic	=	Print Sequence Code (Drainage Details).
007	=	Sheet number (7th Drainage Detail sheet).

Example 2:

b15039ea004.dgn		
b	=	District 11.
1a039	=	First 5 characters of the project expenditure authorization.
ea	=	Print Sequence Code (Layout).
004	=	Sheet number (4th Layout sheet).

Note 1:

A second Print Sequence Code character has been added to the electronic name of each contract plan sheet. Each individual type of contract plan sheet will have its own unique Print Sequence Code. This will eliminate the need to change the electronic name of the existing plan sheets when inserting additional sheets. This will also eliminate the need for recreating InterPlot parameter files (lparms) for some already-created plan sheets.

Note 2:

The sequence order of several sheets has been changed to efficiently group information of similar type and to emulate the sequence of constructing a project.

Note 3:

Several new sheet types have been added to allow information to be utilized without cluttering existing plan sheets with too much information or extraneous information unnecessary for that plan sheet.

Note 4:

New Sheet Identifications (ID's) have been created to accommodate a unique Sheet ID for each Print Sequence Code (with the exception of retaining walls and sound walls).

Note 5:

The sheet number following the Print Sequence Code will be the same as the Sheet ID number (with the exception of retaining walls, sound walls and signals, lighting and electrical system sheets).

Note 6:

Highway Planting sheets (that are part of a Highway Construction project) will no longer have HP as the Sheet ID. See Drawing Codes – Highway Construction Projects pages 2-22 through 2-24.

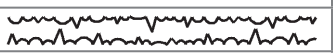
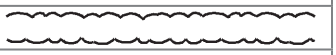
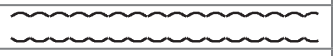
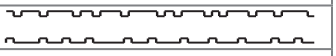
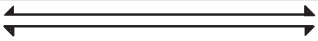
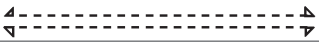
Caltrans Line Styles

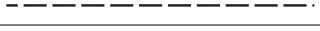
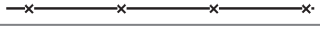
(ctlstyle.rsc) Version: August 2004

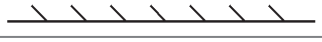
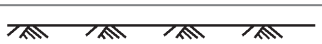
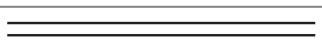
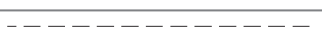
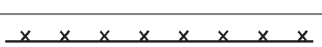
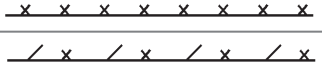
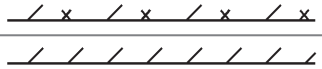
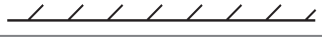
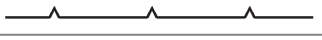
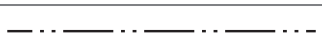
ID #	Name	Description	Image
99	aa001	Version Date	Version: Aug 2004

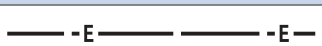
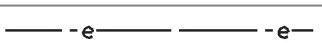
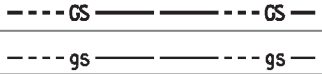
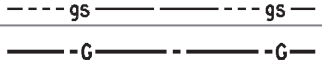
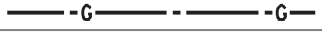
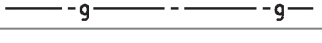
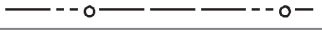
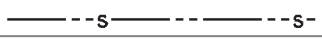
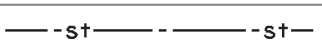
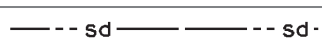
PROJECT PLANS (100s) – dashed lines			
ID #	Name	Description	Image
100	pp-axis	Super Axis of Rotation	
101	pp-city	City Owner line	
103	pp-cldet	Detail Center Line	
104	pp-county	County Owner Line	
105	pp-doto	Dotted Line	
106	pp-forest	Forest Boundary	
107	pp-Lc1	Dotted Line	
108	pp-Lc2	Medium Dash	
109	pp-Lc3	Long Dash	
110	pp-Lc4	Dash-Dot	
111	pp-Lc5	Short Dash	
112	pp-Lc6	Dash-Dot-Dot	
113	pp-Lc7	Long Dash-Short Dash	
114	pp-ldash	Long Dash	
115	pp-match	Match Line	
116	pp-mdash	Medium Dash	
117	pp-sdash	Short Dash	
118	pp-state	State Boundary	

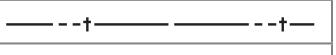
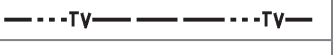
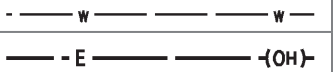
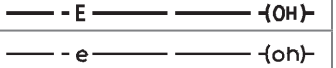
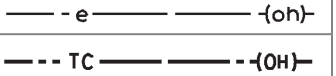
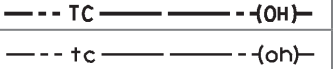
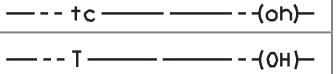
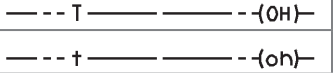
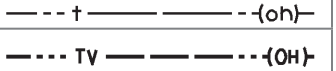
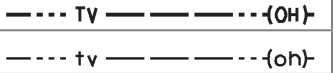
Landscape (200s)			
ID #	Name	Description	Image
201	ls-cnc-p	Control and Neutral Conductor	
202	ls-cnc-x	Control and Neutral Conductor (Existing)	
203	ls-cond-p	Conduit	
204	ls-cond-x	Conduit (Existing)	
205	ls-dip-p	Ductile Iron Pipe	DIP DIP
206	ls-dip-x	Ductile Iron Pipe (Existing)	dip dip
207	ls-gc1	Ground cover	
208	ls-gsp-p	Galv steel pipe	
209	ls-gsp-x	Galv steel pipe (Existing)	
210	ls-pp-x	Plastic Pipe (Exist)	
211	ls-ppil-p	Plastic Pipe Irrigation	
212	ls-ppil-x	Plastic Pipe Irrigation (Exist)	

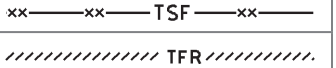
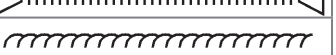
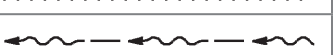
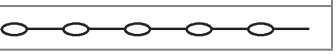
Landscape (200s) continued			
ID #	Name	Description	Image
213	ls-s10a	Arc Angle Shrub 1 side	
214	ls-s10af	Arc Angle Shrub 2 sides	
215	ls-s10b	Cloud Shrub 1 side	
216	ls-s10bf	Cloud Shrub 2 sides	
217	ls-s10c	Round Shrub 1 side	
218	ls-s10cf	Round Shrub 2 sides	
219	ls-s15a	Square Shrub 1 side	
220	ls-s15af	Square Shrub 2 sides	
221	ls-s15b	Round Shrub 1 side	
222	ls-s15bf	Round Shrub 2 sides	
223	ls-s15c	Castle Shrub 1 side	
224	ls-s15cf	Castle Shrub 2 sides	
225	ls-s20a	Round Shrub 1 side	
226	ls-s20af	Round Shrub 2 sides	
227	ls-s20b	Cloud Shrub 1 side	
228	ls-s20bf	Cloud Shrub 2 sides	
229	ls-s6a	Round Shrub 1 side	
230	ls-s6af	Round Shrub 2 sides	
231	ls-s6b	Square Shrub 1 side	
232	ls-s6bf	Square Shrub 2 sides	
233	ls-scc-p	Sprinkler Control Cond	
234	ls-scc-x	Sprinkler Control Cond (exist)	
235	ls-vine1	Vine-Open	
236	ls-vine2	Vine-Full	
237	ls-vine3	Vine-Open with V	
238	ls-sleeve-p	Irrigation Sleeve	
239	ls-sleeve-x	Irrigation Sleeve (Exist)	

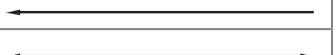
Landscape (400s)			
ID #	Name	Description	Image
401	rd-barrier	Concrete Barrier	
402	rd-cmp	Corrugated Metal Pipe	
403	rd-curb	Curb	
404	rd-curbg	Curb and Gutter	
405	rd-dblbar	Double Beam Barrier	
406	rd-fence	Fence	

Landscape (400s) continued			
ID #	Name	Description	Image
407	rd-flowln	Drainage Flow Line	
408	rd-grind	Grind PCC	
409	rd-mbgr-p	Guard Rail	
410	rd-mbgr-x	Guard Rail (exist)	
411	rd-og	Original Ground	
412	rd-pipeL-p	Drain Line	
413	rd-pipeL-x	Drain Line (exist)	
414	rd-planing	Planing	
415	rd-planresf	Resurface / Obliterate	
416	rd-resurf	Resurface	
417	rd-wallbar	Wall top of Barrier	
418	rd-wall-p	Wall (New)	
419	rd-wall-x	Wall (Exist)	
420	rd-LnStrpDsh	Lane Stripe – Dash	
421	rd-Krail	Temporary K-Rail	
422	rd-wateredge	River and Lake boundaries	
423	rd-stream	Rivers and Creeks	

Utilities (700s)			
ID #	Name	Description	Image
701	ut-elec-p	Electrical Conduit (UG)	
702	ut-elec-x	Electrical Conduit (exist)	
703	ut-gas-p	Gasoline Conduit	
704	ut-gas-x	Gasoline Conduit (exist)	
705	ut-natgas-p	Natural Gas	
706	ut-natgas-x	Natural Gas (exist)	
707	ut-oil-p	Oil Line	
708	ut-oil-x	Oil Line (exist)	
709	ut-sewer-p	Sewer Line	
710	ut-sewer-x	Sewer Line (exist)	
711	ut-steam-p	Steam Utility Line	
712	ut-steam-x	Steam Utility Line (exist)	
713	ut-stormd-p	Storm Drain Line	
714	ut-stormd-x	Storm Drain Line (exist.)	
715	ut-telecom-p	Telemeter Cable Line	
716	ut-telecom-x	Telemeter Cable Line (exist)	

Utilities (700s) continued			
ID #	Name	Description	Image
717	ut-teleph-p	Telephone Line (UG)	
718	ut-teleph-x	Telephone Line (exist)	
719	ut-tv-p	Television Line (UG)	
720	ut-tv-x	Television Line (exist)	
721	ut-water-p	Water Line	
722	ut-water-x	Water Line (exist)	
723	ut-elec-oh-p	Electrical Cond – (New OH)	
724	ut-elec-oh-x	Electrical Cond – (Exist OH)	
725	ut-telecom-oh-p	Telemeter Cable Util Line (OH)	
726	ut-telecom-oh-x	Telemeter Cable Util Line (Exist OH)	
727	ut-teleph-oh-p	Telephone Line (New OH)	
728	ut-teleph-oh-x	Telephone Line (Exist OH)	
729	ut-tv-oh-p	Television Line (New OH)	
730	ut-tv-oh-x	Television Line (Exist OH)	
731	ut-fiberopt-oh-p	Fiber Optic Line (New OH)	
732	ut-fiberopt-oh-x	Fiber Optic Line (Exist OH)	

Water Pollution Control – WPC-BMPs (800s)			
ID #	Name	Description	Image
801	sw-TFESA	Temporary Fence	
802	sw-TSF	Temporary Silt Fence	
803	sw-TFR	Temporary Fiber Roll	
804	sw-TGBB	Temp. Gravel Bag Barrier	
805	sw-TSBB	Temp. Straw Bale Barrier	
806	sw-TSDFP	Temp. Slope Drain Flex Pipe	
807	sw-TEB	Temporary Earth Berm	
808	sw-TDS	Temporary Ditch/Swale	
809	sw-TLB1	Temp. Linear Barrier (Type 1)	
810	sw-TLB2	Temp. Linear Barrier (Type 2)	
811	sw-TLB3	Temp. Linear Barrier (Type 3)	

Miscellaneous (900s)			
ID #	Name	Description	Image
901	zz-fillshape1	For translucent fill (pentable function)	
902	zz-arrow1	Leader line with arrow	
903	zz-arrow2	Dimension line arrows