

4.1 For Plans, Specifications & Estimate (PS&E) Submittal

A. File Formats for PS&E

1. Acceptable Formats

Caltrans only accepts 100% electronic submittals. The standard file format for all PS&E submittals is a MicroStation design file with a .dgn extension. All Caltrans resource files used for PS&E submittal are for MicroStation. Caltrans does not provide AutoCAD resource files.

a) MicroStation File Format

Caltrans accepts MicroStation V8 format files for PS&E submittals. Final contract plans (2D MicroStation design files with no reference files attached) must be submitted. If there is a need to facilitate sharing of electronic data among Caltrans functional units and /or consultants, best practice procedures would have all participants involved on the project using the same file format and versions of MicroStation when possible. Caltrans preference would be the use of V8 format files created using MicroStation CONNECT.

b) Variations with Prior Approval

The following variations, with prior approval at approximately 60% completion, from Division of Design, Office of CADD and GIS Support will also be acceptable for PS&E Submittal. Specific circumstances are listed below:

- **MicroStation design files** with imbedded or imported raster data (aerial photographs or digital pictures). Raster data should be limited to detail sheets that require enhancing or emphasizing of a detail or a unique location (i.e., toll plaza at the San Francisco/Oakland Bay Bridge) that the contractor might need to see. The need for imported raster data should be based on an engineering need, not for aesthetics or location identification. Contract plans should first and foremost be engineered plans, not photogrammetric plans. Aerial photographs were designed for preliminary plans not final contract plans. If aerial mapping is needed for identifying specific locations, plan sheets have been established to handle the raster data. These sheets are called “Aerial Identification” and follow the “Key Map and Line Index” sheets. Raster data should not be used as background for other plan sheets such as layouts, drainage, utilities, pavement delineation, etc.
- **(Tiff) or Tagged Image File Format** is acceptable where legacy plans (in most cases this refers to Log of Test Boring sheets) are being considered

for submission as part of a new CADD submittal. This is a single, complete plan sheet with borders intact, submitted as a tiff raster image. The legacy sheet is to be scanned, sized (cropped), de-speckled and de-skewed before submittal. For preferred size of the finished plot and other presentation information, refer to latest version of the [Caltrans Soil and Rock Logging Classification and Presentation Manual](#).

2. Non-Acceptable Formats

- Hard Copy Originals
- **Reference Files** (vector or raster)
- **CADD software Generated Raster-** Any file created as a MicroStation design file, but converted to raster format for convenience or expediency, will not be accepted for PS&E Submittal.
- **Models-** use the “Default” model for final submittals. Submittals must be one MicroStation design file for each contract plan sheet.
- **AutoCAD Files-** Files started with AutoCAD (.dwg or .dxf file) must be converted into a MicroStation design file under the direction of the engineer of record.

B. Reference Files

No reference files of any kind will be accepted with the PS&E Submittal. All information that is pertinent to any specific contract plan sheet needs to reside in just one specific MicroStation design file. This helps convey the fact that all final contract plan sheets are “legal contract documents” and should not be changed because a change was made in a reference file (or model). However, the use of reference files is a very important tool during the development and design of any project. Reference files should stay referenced until just before PS&E submittal, so any change made in a reference file will automatically be reflected in all files that have the reference file attached (not already copied in).

C. Requirements for PS&E

1. General Requirements

A PS&E CADD Submittal Form and a Project Plans Review Checklist must accompany the PS&E submittal.

For electronically generated plan sheet signatures and project plans development names, see Section 2-1.6 of the Plans Preparation Manual for detailed instructions.

2. Caltrans Current Standards

- V8 format files with a *.DGN extension.
- One MicroStation design file per “contract plan sheet”.

- Each MicroStation design file can have an accompanying Interplot parameters file (requirements vary by District. Check with District OE).
- Must use the standard Caltrans MicroStation resource files (fonts, line styles, cell library, etc.).
- Use of the HQ CADD published standard Caltrans Interplot design scripts (pen tables).
- The current plotting requirements must be utilized (see Chapter 5 of the CADD Users Manual).
- All necessary information must be in the “contract plan sheet”, no reference files are to be attached for PS&E submittal.
- Caltrans does not use Global Display/Global Freeze options to control display of elements in the dgn file. Element display must be controlled using View Display toggles.
- Must use the latest Caltrans sheet borders cells, which are included in the latest Caltrans MicroStation cell library (CTCELLIB_NamedLevels.cel).
- Must use prescribed Caltrans text sizes and drafting conventions.
- Compliance with Caltrans named level convention required on all new projects.
- Compliance with Caltrans colors, line weights, line codes, file naming convention, standard abbreviations, and symbols.

3. General Plotting Requirements

All PS&E submittals must conform to Caltrans plotting standards. See below for some specific plotting requirements.

- The official Caltrans plotting application is ProjectWise InterPlot Organizer (IPOT).
- For each MicroStation design file submitted for PS&E (contract plan sheet), an lplot parameters file (called an lparm with an *.i extension) or a pdf file can be created based on District OE’s current practice and included in the final submittal.
- Snap to the outside edges of the sheet border cell (from lower left to upper right preferably) when defining a plot region. Plot size should equal exactly 34 inches x 22 inches.
- All levels used in the dgn file (must use Caltrans named level DGNLIBs) are to be turned on. Make sure only the information pertinent to that specific sheet is in the MicroStation design file. Too much information distracts from the real purpose of the sheet. But missing information may lead to inaccurate cost estimates and bids.
- Ensure that the view rotation is parallel to the sheet border lines. Rotation of elements in the file must be avoided.
- The accepted number of views for a PS&E submittal to District OE is a full plan view of the border sheet with file contents displayed in one monitor.
- Use the design script “CT_FinalPSE.pen” for final submittals.

- Prior to PS&E, design script “CT_ReviewPSE11x17.pen” may be used to create half-size review check prints.
- One important reason that Caltrans uses a standardized level convention is to properly show existing information that is contained in the Master Topographic file. All linework on level names ending with “_drop” will be plotted as dotted lines. See Appendix A10 of this Manual for additional information. Existing information located on non-dropout levels (e.g., utility linework) may be shown using lower thicknesses with linework properly identified.
- It is recommended that the lparms delivered with the PS&E submittal be created after the naming all MicroStation design files so the lparms reflect the correct name for each MicroStation design file (avoiding a plotting failure) and plot in the correct order when both plotting. See Section 2.2 of the CADD Users Manual for the appropriate Caltrans naming convention. Full-size test prints to pdf of the Contract Plans should be made prior to PS&E submittal for plot verification.
- Construction Class elements should not plot when using the IPLOT design scripts supplied by Caltrans. IPLOT software should be configured to comply with this standard.
- Only Caltrans custom linestyles can be used for all Caltrans submittals. The Caltrans linestyle resource file is “Ctlstyle-2021.rsc”.

4. Limitations/Restrictions when using V8 File Format

- Only the “Default” model space shall be used, no extra model spaces must be contained in the contract plan sheets. Final plan sheet submittals must be one MicroStation design file for each “contract plan sheet”.
- Use California State Plane Coordinates.
- Use the V8 seed files supplied by Caltrans-HQ CADD. For every MicroStation highway design file the resolution of **10,000** for the “Working Units” is required.
- Must use the Units.def file created and shared by Caltrans–HQCADD.
- Must use the named level DGNLIB files created and shared by Caltrans-HQ CADD.
- When creating a V8 format design file, a new DGNLIB (created by Caltrans HQ CADD) will be called upon or can be attached. This new DGNLIB will incorporate all the levels necessary for the various Caltrans functional units. Only Caltrans - HQ CADD can add or change any information from these levels in the DGNLIB.
- Roadway and associated elements must be stored on levels grouped under **align, ds, es, esa, ls, mc, border, rd, stage, temp, tcd, wall, wpc** and **pp**. Section 2.4 of this manual has additional information about Caltrans standard group names.
- Right of Way and topo information will be stored on levels grouped under **rw, rw_topo, topo, topo_al, topo_ml, topo_ph** and **topo_su**.

- Structures Design will be stored on levels grouped under **str**.
- Structures Architectural plans stored on levels grouped under **ar**.
- Structures Mechanical plans will be stored on levels grouped under **me**.
- Structures Electrical plans will be stored on levels grouped under **ee**.
- Utility related information will be stored on levels grouped under **ut**.
- Dropout levels – data on level names ending with ***_drop** or **_dither** (**Structures only**)
- Structures Rebar will have levels named **str_Reinforcement-***
- Stage Construction (non-dropout) will now have levels grouped under **stage**.

All new projects with survey data delivered using named levels must use named level convention when creating plan sheet deliverables. For a detailed list of named levels, see Appendix A10 in this manual.

D. Consultant Prepared Projects

Consultant prepared projects must comply with the requirements set forth in the Plans Preparation Manual (PPM) and CADD Users Manual. The latest versions of these two manuals are located on the Caltrans website and should be reviewed and followed by both Caltrans and consultants for any changes, deletions, or additions.

CADD Users Manual:

<https://dot.ca.gov/programs/design/manual-cadd-users-manual>

PPM:

<https://dot.ca.gov/programs/design/manual-plans-preparation-manual-ppm>

Consultants are to adhere to the same requirements as any Caltrans project engineer, being guided by the Highway Design Manual, Project Development Procedures Manual, and any directive Memorandums. This includes advance-planning studies, preliminary design, Plans, Specifications and Estimate (PS&E) submittals, support through the construction of the project and completion of the as-built plans.

All consultant prepared projects are to be submitted to the district administering the oversight contract at the agreed upon stages of the project (30%, 60%, 90%, etc.). The district is responsible for verifying (both electronic files and plotted plan sets) and submitting a consultant project to Division of Engineering Services – Program/Project Management and Office Engineer (PPM&OE) and then keeping the consultants informed on comments, reviews, or questions from PPM&OE. Likewise, consultants are responsible for informing Caltrans Oversight staff of any modifications and/or additions during the various preliminary and final stages of project plan development. Any questions or requests by consultants should first be directed to the appropriate Caltrans' District Design Oversight Engineer.

Consultants can obtain the Caltrans resource files at the following website:

<https://misc-external.dot.ca.gov/cadd/index.htm>

Cooperative Agreements and Contract Agreements should state that the latest standards, identified in the CADD Users Manual and PPM (the latest versions being on the Caltrans website), are to be followed for all final products (deliverables) throughout the Project Delivery Process.