

2-2.5 Layouts, Profiles and Superelevation Diagrams

General

A layout sheet is defined as one of the following:

- Full Plan Sheet
- Combined Plan and Profile Sheet
- Combined Plan, Profile and Superelevation Diagram Sheet

The layout is the base plan sheet for the project. Other plan sheets such as drainage, signing, pavement delineation, etc., are necessary when there is not sufficient space to clearly show all work on the layouts or a second engineer is taking responsibility and signing for a specific type of work.

Layouts contain the general project data such as the horizontal alignment lines, right of way lines, easements, proposed construction not shown on other plan sheets and pertinent existing facilities.

At interchange areas it may be necessary to show plan and profile on separate sheets. In metropolitan areas and at rural interchanges, separate full layout plan sheets may be necessary to show all the required data. Where a full plan sheet is needed for plan layout, full profile sheets are to be used to show mainline profiles and the superelevation diagram. As a Caltrans best practice, profiles of supplemental lines, such as frontage roads, crossroads, ramps and other roads should have their own full profile sheets with the superelevation diagram.

For layout sheets, a horizontal plotting scale of 1" = 50' (Caltrans base scale) should be used in urban areas and some rural areas. A horizontal plotting scale of 1" = 100' may be used in rural areas. It is permissible to use both scales within a set of plans provided each sheet contains only one scale. Where a horizontal plotting scale of

1" = 50' is used and just a few items of work are involved, the roadway layout information may be stacked one above the other on the same plan sheet. A horizontal plotting scale of 1" = 20' is used where greater detail and clarity is required. These sheets would typically be used for road intersections, signal and lighting plans, etc. Use only the three plotting scales mentioned in this paragraph for any plan view sheet.

Layout sheets must be oriented to show mainline stationing progressing left to right with certain exceptions identified within this section. All station lines and profiles must be shown in feet only.

If arrangement of the roadway layout information is such that "stacking" is necessary (the roadway layout information stacked one above the other on the same plan sheet), the sheet is to be arranged so that the stationing progresses from the top half of the sheet to the bottom half of the sheet using match lines. The layout information on the top half of the sheet must maintain the coordinate values from the California Coordinate System (CCS). The bottom half of the sheet would not be able to maintain the coordinate values, but it easily could be relocated coordinately correct if it is moved to the top half so that the match lines properly line up.

Sheets are to be arranged to contain major construction features on one sheet. Wherever possible, the major portion of an interchange should appear on one sheet. This may necessitate breaks and match lines for the ends of minor road connections. Station equations may cause the profiles, if shown at the bottom of the layout plan, to determine sheet arrangement. Sheets should not end within a road intersection. The complete road intersection should be shown on one sheet. Diagonal placement is satisfactory to attain better coverage. Mainline stationing (or any

other route) must not overlap from one sheet to the other.

Do not show the same area twice within the layout sheets, unless (in the rare instance) a demolition sheet is necessary. The layout (demolition) sheet would show the existing conditions that need to be removed before the proposed work can begin. Demolition sheets go at the end of the layout sheets and have a sheet identification code of “L” with a sub-script “DEMOLITION.” On the layout sheet showing the proposed work, there is to be a note stating that there is a corresponding demolition sheet.

Match lines are to be placed when a route is shown on more than one sheet. The match line break is to be located halfway between station tick marks (i.e. +50) and is to be perpendicular to the alignment line. Match lines should not be placed at a full station, because the match line would obscure the station annotation and station tick mark. A “MATCH LINE” callout is not necessary when sheets are consecutive or there are not multiple match lines. References to adjoining sheets such as “MATCH LINE (L-5)” is optional but may be advisable where many match lines are shown on one sheet (such as sheets showing interchange areas, freeway to freeway connectors, etc.). Reference to a plus station at the match line “MATCH LINE +35” is also an option and should only be used if the match line is not located at “+50.”

As a general rule, if a project contains only one crossroad or crossing route where construction is to be performed, the sheet numbering order of the mainline is interrupted to show the entirety of the construction on the crossroad or crossing route. The sheet numbering for the crossroad or crossing route must begin with the next consecutive sheet number after the interrupted mainline sheet number (example: mainline, L-4; beginning sheet for crossroad or crossing route, L-5). Sheet numbers must be sequential. If the last sheet number used for the crossroad or

crossing route is L-8, the mainline sheet numbering will resume with L-9. The sheet(s) containing the crossroad or crossing route information may be rotated to attain better coverage. Stationing in most instances is to progress from left to right on a sheet, but in some instances, stationing may progress from the bottom to the top of a sheet. If a project contains more than one crossroad or crossing route, first complete the mainline presentation (or route where the majority of the work occurs) then put the crossroad or crossing route sheets at the end of the layout sheet order. There may be instances when the stationing for the crossroad or crossing route progresses from top to bottom with respect to the mainline stationing which goes left to right. This occurs only occasionally because the original stationing for the crossroad or crossing route was created in that direction.

Preparation Procedures

CADD allows the separation of drawing data by kind of data. The CADD system defines the various layers of similar data as “levels.” Geographical drawings are created by combining levels of data from a master drawing. Refer to Section 2.4 of the CADD Manual.

Existing topography may be provided by scanned maps, digitized maps, or maps from ground surveys. Photogrammetric mapping lines and symbols are shown in the Caltrans Standard Plans. Symbology for design features are also shown in the Standard Plans.

Existing facilities must be shown as dropped out (a dotted line which is achieved by using pre-defined dropout levels and the Caltrans Interplot design scripts) or with dashed lines on a non-dropout level. Proposed construction must be shown with solid lines or the appropriate symbology (not dropped out).

Caltrans symbols, abbreviations, and line symbology are shown in the Caltrans Standard Plans. The Caltrans CADD English Cell Library and the Caltrans Line Style Resource file must be used for Caltrans standard symbology. Abbreviations and symbols not listed in the Standard Plans, which are used within the layouts, must be listed along with their meanings on the first layout sheet only. Do not duplicate acronyms or abbreviations shown in the Standard Plans.

The appropriate version of the Standard Plans that supplement the entire project is identified on the Title Sheet. Thus to add the generic label “SEE STANDARD PLANS” is not necessary. But a specific page in the Standard Plans may be identified with a specific detail being labeled (either by text or symbol) for the benefit of the bidder/contractor.

The appropriate right of way note must appear on each plan view sheet where right of way is either shown on the plans or where indeterminate right of way exists.

Line weights and line styles must conform to the requirements in Section 2.7 of the CADD Users Manual. Refer to Section 2.6 of the CADD Users Manual or various examples in the PPM for text sizes and fonts. Caltrans uses uppercase text for projects with the exception of abbreviations (see Standard Plans). See Section 2-1.2 of this manual regarding placement of text.

Standards, practices and conventions used for showing information on layout sheets also apply to all other plan view sheets showing the same or similar information.

Plan Content

On extensive or complex projects, there may be too much information to show clearly on the

layouts. Design information should be grouped by type and shown on separate plans such as: drainage, pavement delineation, etc. Proposed design information, when labeled as an item of work and is used to calculate quantities, must only be labeled on one type of plan sheet. Proposed design information may be shown on another plan view or detail sheet if other items of work connect to it or if by showing it, it helps indicate any potential conflicts with existing or proposed work. If proposed design information is shown on another sheet, it must not be labeled as or misconstrued as an item of work. Subsurface facility information (utilities) may be shown on other plan view sheets (such as drainage plans or electrical system plans) if it helps bring attention to any potential utility conflicts.

Some proposed design information may be shown as existing due to stage construction or sequence of work (example: Stage 1 construction is shown as existing on plan sheets showing proposed work for Stage 2 construction, since work from the prior stage or sequence will have already been completed).

Irrigation conduits are usually shown and labeled as an item of work on the layout sheets (because they are placed when the pavement structure is constructed). But the irrigation conduit is also shown on the irrigation plans because items on the irrigation plans connect to and utilize the irrigation conduit. DO NOT label it as an item of work on the irrigation plans (as this would cause confusion to the bidder and contractor when it comes to verifying the total quantity for irrigation conduits). As a best practice, the irrigation conduit is shown on the irrigations plans as a non-dropped out line with the line weight reduced to WT=0.

Only those existing topographic features which affect bidding, construction, and maintenance, and which are essential for field orientation of the plans are to be shown. Showing too much

extraneous topographic information makes it difficult to clearly see the important design information on the layout. Confine topography to the right of way or area of construction, including the space needed for equipment. In urban areas any features pertinent to construction, such as streets, curbs, gutters, and sidewalks involved in the construction, should be shown. In rural areas where little topography exists, all topography may be shown if it does not clutter the layout. Buildings and facilities within the right of way that will be removed prior to construction are not to be shown.

Routes or roads not part of the project construction, but shown on the plans for orientation purposes, should be identified and labeled with normal size text (see checklist for layout sheet). Routes or roads where project construction is to be performed may be identified with larger size font to make them stand out on layouts which contain a large amount of information.

Label what work is to be performed on existing facilities, such as "abandon," "remove," etc., but avoid using the word "existing" in the callout as it does not convey additional information to the bidder or contractor. Use "existing" only when it is an integral part of the bid item description (e.g., "install sign panel on existing frame"). Avoid using the words "construct," "place," etc., for new construction, as they do not convey additional information to the bidder or contractor. Use "place" only when it is an integral part of the bid item description (e.g., "place hot mix asphalt dike (Type B)"). Necessary dimensions are to be included. Use plus stations at begin and end of roadway items shown on the layouts (this also applies to other plan view sheets). If the length of an item is included in the callout, use decimal feet.

All projects require a Project Engineer Utility Certification signed by a registered civil engineer, even if the project is a landscape or

electrical systems project only. As a Caltrans best practice, utility plans are to be prepared for all projects that have any utilities within the project limits. The utility plan sheets are usually signed by the same registered civil engineer signing the Project Engineer Utility Certification.

For small projects where all information can be clearly shown on one type of sheet, the subsurface and aerial facilities may be shown on the layout sheets instead of having separate utility sheets.

Unless specifically exempted by the Division of Design, Chief, all utility facilities known to the designer within the areas where project work is to be performed (including State-owned underground utilities, underground utilities owned by others and aerial facilities), must be shown on the utility plans.

High priority shall be shown as provided in Chapter 17 of the Project Development Procedures Manual (PDPM).

Accuracy of the locations of State-owned underground utilities is not to hinder the disclosure of underground facility information. The location of these facilities is to be shown to the best degree of information available.

Alignment (stationing/geometry) data from when the highway was constructed or realigned is to be used for all projects, as right of way record maps and other historical records usually perpetuate the original stationing and line designation. Refer to As-Built plans to avoid the creation of new stationing and line designations that have no connection to the right of way record maps and other historical records. If a project was constructed with Metric stationing, work with the districts surveys office to determine the most appropriate English stationing to utilize (stationing should start with 3 digits left of the "+" symbol i.e. 100+00).

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Where the ramp stationing ties into and is offset to the mainline, the ramp stationing is to be the same value as the mainline, but with a ramp line designation.

For minor projects that do not require staking (such as seal coat or surface course) or projects where there are many locations of work (such as some electrical system projects), post miles may be shown on the plans instead of stationing. Post miles are to be shown to at least a tenth of a post mile or a hundredth depending on the accuracy required. But either stationing (in most all cases) or post miles must be shown on all plan view sheets for all projects.

Alignment data for all stationing lines (mainlines, ramps, crossroads, frontage roads, relocated local streets, etc.) must be shown. Stationing equations, distances and bearings of all tangents, stations of all curve points and curve data must be shown.

All curve data numbers must be consecutive for each station line. Do not restart curve data numbers over when going to the next layout sheet. Curve data numbers for different station lines may have gaps in the numbering from other station lines, thus allowing for possible last-minute changes without having to renumber curve data from any other station line than the one changed. Do not duplicate curve numbers shown on any of the layout sheets.

Coordinate values may be included on the layouts within the curve data tables for selected points (BCs and ECs) along the stationing line. A few coordinate points identified with “tick marks” (tied to a physical feature that can be located in the field) may be displayed within the layout plans to help assist surveys when staking the project. Showing coordinate values does not take the place of supplying the required electronic files to surveys and construction containing station lines, staking, and surveying information needed for construction.

If the contractor is required to perpetuate the monumentation, the monuments are to be shown and identified on the layouts, using a unique symbol, identified in the legend. Project Control should be shown on the Project Control Plan sheet (see Section 2-2.4 of the PPM). If monumentation information is included on the layouts, place a note on the first sheet of the layouts to indicate the basis of the horizontal control used. If elevations are shown indicate the basis of the vertical control used. If a Project Control sheet is included in the contract plans, reference the sheet in a note on the layouts. If the project does not have any plan view sheets, identify the monumentation points in tabular format on the construction detail sheets.

Show and label right of way lines, easement lines, right of entry and state, county and city lines. Show and label, township, range and section lines and corners, recorded subdivisions, Spanish grants, state and national parks, swampland and tideland surveys but only when it is of benefit and assists in the construction of the project. Show and label any environmentally sensitive areas (ESA).

The "Checklist for Layout Sheet" contained elsewhere in this section lists the various elements included on the layout sheet.

Profile Content

Data shown on the profile sheet is produced from the roadway software. The proper display for callouts and annotation is handled in the drafting software. The most common vertical scales are:

- 1" = 10' - Rural sections in hilly and mountainous terrain with considerable rise and fall.

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- 1" = 5' - Rural or urban areas with gently rolling terrain with less than two percent general ground slope.
- 1" = 2' - Rural or urban areas in level terrain where precise grade and gutter design is required.

Horizontal to vertical scale ratios producing profile grade line plots steeper than 1:1 are to be avoided. Scale ratio of H/V = 10 is most commonly used. The profile grade is shown by percentage. Use two decimal accuracy for new profiles and three decimal accuracy for widening projects that match the existing profile (usually at 100' intervals).

Datum elevations are to be placed on top of the horizontal grid line they represent at both sides of the profile grid. Placing datum elevations on all grid lines on the sheet is not necessary. Only a few elevations slightly above and below the profile line are needed.

The basis of the vertical control is to be shown by a note on the first sheet of profiles.

The original groundline must be checked for obvious errors in plotting and missing break points at ditches, levees, etc.

The original groundline and profile grade line should not crowd the top or bottom of the sheet.

On combined plan and profile sheets the profile stationing must line up with the stationing as shown in the plan portion. The plan portion is always on the top half of the sheet while the profile is on the bottom half. If plan and profile are combined for a particular route (line designation), then it must be presented the same for that entire route. For the same route (line designation), do not have some sheets with just the plan view and some sheets with the combined plan and profile.

On full profile sheets the horizontal scale need not correspond to the plan scale on the layouts, but it is recommended. If there are superelevation diagrams it is recommended that they are shown on the same sheet with the corresponding profile. The superelevation diagram is always on the top half of the sheet while the profile is on the bottom half. If the superelevation diagram is shown with the corresponding profile for a particular route (line designation), then it must be presented the same for the entire route. For the same route (line designation), do not have some sheets with just the profile and some sheets with the combined superelevation diagram and profile.

Where profiles are "stacked" on one profile grid sheet, they are to be arranged so that stationing progresses from the top half of the sheet to the bottom half of the sheet. If "stacked" use one of the split grid sheets that is available in the Caltrans cell library (prf15, prf10s & prf20s). The stationing and the earthwork quantities are to be shown separately for each half.

Profile stationing must not overlap. Equation stations may control coverage and arrangement. A gap in the profile line should be shown between the back and forward stations of the equation. The preferred method of showing the gap is to stop the profile line at the back station of the equation on the profile sheet and resume showing the profile line at the forward station of the equation on the next profile sheet, unless impractical to do so. Where the equation station gap is shown on the same profile sheet:

- The beginning of the gap must be at the back station of the equation and the end of the gap must be at the forward station of the equation.
- The actual distance through the equation between adjacent full stations is to be shown.

To provide a complete picture, the original groundline is to extend a few stations beyond the beginning and end of the project if this does not require an additional sheet. Future grade lines (usually prompted by the staging of construction contracts) are to be labeled and shown as short dashed lines. Other grade lines, such as ditches, gutters, and pipes, are to be shown by symbology as depicted in the Standard Plans and labeled appropriately.

If the profile grade (PG) line is not on the station line (the Typical Cross Sections sheets are always to show the relationship between the PG and station line), or the construction layout line for a wall, a note is to be added to indicate the position of the profile grade, such as "PROFILE GRADE AT INNER ETW" or for example "PROFILE GRADE IS 3' LEFT OR RIGHT OF STATION LINE."

The names of all major intersected streets, railroads, grade separation structures, streams, and other station lines are to be labeled vertically (bottom to top) along the profile.

Roadway excavation and embankment quantities are to be listed along the bottom of the profile (on full profile, plan and profile and stacked profile sheets). These quantities may be listed by station, or individual cuts and fills (division points of cut and fill quantities may not be at same station limits). One of the reasons for listing excavation and embankment quantities is to help bidders and the contractor determine haul distances and understand the scope of the earthwork. Where the roadway crosses a stream or crossroad, the point of crossing should be a division point for listing cut and fill quantities. Where quantities for major ramps or other roads have been calculated separately, they are to be listed with their respective profiles rather than lumping them with the main line. In such a case, a cross-reference note is to be used. Sheet totals are to be shown in the lower right corner when

quantities are listed by station. Where an individual cut or fill area carries over to the next sheet, the total for the individual cut or fill is to be carried over and shown on the next sheet.

The "Checklist for Profile" contained elsewhere in this section lists the various elements included on the profile sheet.

Superelevation Diagram

A superelevation diagram is a graphic representation of the crown slopes, superelevations, and superelevation transitions of the pavement and shoulders. See generic superelevation diagram example “sheet 5 of 5” for which transition points need to be shown (as identified in the Highway Design Manual). In all cases the superelevation diagram (whether for the mainline or all ramps) must be presented from the perspective of looking “up-station” for the mainline.

The axis of rotation for each line designation is the PG line as identified on the typical cross section sheets. A Caltrans best practice is to have the axis of rotation at the highest point on the roadbed when in a tangent section for that roadbed. See generic superelevation diagram examples “sheets 1 of 5, 2 of 5 & 3 of 5” for explaining the relationship between the typical cross sections and the superelevation diagram.

Identifying the PG/axis of rotation for ramps (with respect to the typical cross sections and superelevation diagram) is shown on generic superelevation diagram example “sheet 4 of 5.” The stationing for ramps must follow the direction of the mainline stationing (not the direction of the flow of traffic).

Clearly label the various planes (traveled way and shoulders) begin and end horizontal curve and transition points (with a triangle). See generic superelevation diagram example “sheet 5 of 5” for the complete drafting presentation of a superelevation diagram.

Vertical curves at the beginning and end of superelevation transitions do not need to be shown.

Certain combinations of profile grade line, vertical curves, superelevation transitions, and

variable pavement widths may produce undesirable pavement edge profiles. Where these combinations occur, it is essential during design to generate edge of traveled way and edge of shoulder profiles and adjust bumps and drainage pockets to eliminate ponding. These edge of traveled way and edge of shoulder profiles should be drawn to an exaggerated vertical scale and submitted (separately from the superelevation diagrams in the final contract plans) to the Resident Engineer and surveys for use in staking.

The "Checklist for Superelevation Diagram" contained in this section lists the various elements included on the superelevation diagram sheet.

**CHECKLIST FOR LAYOUT SHEET
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- District, county and route TX=7.0, FT=3, WT=1, LV= border_PROJ-ID-BLOCK-anno (10) (upper right corner of sheet)
- Post Miles TX=7.0, FT=3, WT=1, LV= border_PROJ-ID-BLOCK-anno (10) (upper right corner of sheet)
- Unit and Project Number and Phase (lower right corner of sheet) TX=7.0, FT=3, WT=1, LV= border_SHEET (10)
- Signature and date of signature are included on LV= border_SIGNATURE (63). Current registration seal information is to be included on LV=border_SEAL (10), (upper right corner of sheet). The signature is added as the last step before the project goes to PS&E. The text size for the date and information inside the seal is to be TH=7.0, TW=5.0, FT=3, WT=1, but the width can be squeezed to fit the area. If both names are long, the first name can be above the last name
- Standard north arrow (AC = NARR LV= pp_PRESENTATION, WT=1)
- Scale (TX=8.75, FT=3, WT=2, LV= border_INSIDE-BORDER-anno (10)) place below the sheet name (centered)
- Information inserted in plan sheet development name block spaces in left margin of border sheet. See Figures 2-10 and 2-11 in Section 2-1.6 of this manual for additional instructions
- Right of way must be shown on all layout sheets unless it is indeterminate. The following note must be shown on each layout sheet where right of way is shown: "FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE." Include this note on any other plan view sheet that shows right of way lines
- If right of way is indeterminate, the following note must be shown on each plan view sheet where there is indeterminate right of way:
- "RIGHT OF WAY LIMITS ARE INDETERMINATE AND ARE NOT SHOWN. THE CONTRACTOR MUST CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE FOR CONDITIONS OF USE PRIOR TO COMMENCING WORK."
- First sheet of layouts contains notes, legends, symbols, and a list of abbreviations (do not include standard plan abbreviations as part of the listed abbreviations)
- Bearing and distance of tangent sections must be identified on all stationed lines and are typically placed above the alignment line
- Station equations
- Identify routes within the project limits. Line designations and routes must be identified and are typically placed above the alignment line. Do not use route shields. The following typically applies to route identification where work is performed: TX=8.75, FT=3, WT=2, LV= align_MAIN-anno (16). On routes where no work is being performed, the following may apply: TX=7.0, FT=3, WT=1, LV=align_MAIN-anno (16). On very complex projects, where the layouts contain a large amount of information, the following may apply to identify

**CHECKLIST FOR LAYOUT SHEET
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routes where work is performed:
TX=10.0, FT=43, WT=0, LV=
align_MAIN-anno (16).

- Curve data (all curve data numbers must be consecutive “for each station line” throughout the layout sheets). Northing and easting values for BCs and ECs are optional, but if shown, the basis of the horizontal control used must be identified on the first layout sheet
- Edge of traveled way and shoulders
- Edge of pavement (EP) is to be shown as a thicker weight line (usually WT=2) to more clearly define the EP
- Dimension the total width of traveled way for each direction plus the shoulders (not necessary to dimension each lane, reserve that for the pavement delineation sheets)
- Access control lines that have access control tick marks are not to appear on the contract plans. Access control lines belong on right of way record maps
- Fences and gates
- Township, range and section lines and corners, state and national parks, swampland and tideland surveys but only when it is of benefit and assists in the construction of the project
- City and county limit lines labeled appropriately
- Guard railing, barriers and crash cushions
- Drainage, striping, and signing, (unless shown on separate sheets)
- Utilities are to be shown on utility plan sheets, unless the project is small and all information can clearly be shown on the layouts
- Bridge names and numbers (show bridge number only when work is to be performed on bridge and bridge plans are included) TX=8.75, FT=3, WT=2, LV=pp_LEGEND-anno (23).
- Waterways (stream, creek, river, etc.) and direction of flow TX=7.0, FT=3 at 25° slant, WT=1, LV=pp_LEGEND-anno (23) upper/lower case text
- Retaining walls and sound walls shown and labeled on layouts for length and layout line offset from highway alignment line
- Mandatory material and disposal sites (use of mandatory sites is to be avoided where possible). If the sites are not within project limits, include in Materials Handout and not on the layouts
- Road approaches
- As an option, Northing and Easting value of a fixed, known object that physically can be located in the field. Shown for referencing to the correct location and zone in the California Coordinate System

**CHECKLIST FOR LAYOUT SHEET
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- For grade separations, most of the features associated with the underneath roadbed (usually depicted by some type of line) should be clipped for that portion directly underneath the above route. For the options of what should be clipped (or in some cases dashed), see the examples for Layouts “Generic Plan View Sheet for Grade Separations.” These options only apply to that portion of the route (or stream/river) that is directly underneath the above route
- Stage construction, traffic handling or detours (unless shown on separate sheets)
- Limits of pavement removal
- Existing pavements
- Curbs and dikes
- Sidewalks, driveways, curb ramps (type)
- Grinding, cold planing, and replace asphalt concrete surfacing, etc. Thickness of existing pavement must be identified on the typical cross sections
- Monument points when the contractor is required to perpetuate monumentation
- Topography (when pertinent)
- Cut and fill lines
- Easement and permits
- Environmentally sensitive area (ESA) limits shown
- Edge drain locations, including types of outlets, vents and cleanouts. If layouts are cluttered edge drains can be shown on drainage plans. If drainage plans are also cluttered, edge drains can be shown on separate edge drain plans.

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**CHECKLIST FOR PROFILE SHEET
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- Original ground lines labeled as “OG”. Original ground line should extend a few stations beyond the beginning and end of profiles on the first and last sheet
 - Future grade lines (used for staged contracts) shown as short dashed lines and labeled
 - Profile grade line labeled as “PG” with the grade percent. Use 2 decimal places for new profiles and 3 decimal places when matching existing profile
 - Line designation and route identified in the title
 - Vertical curve lengths labeled (in feet). Grade tangents must be shown at point of reverse vertical curvature (PRVC) or point of compound vertical curvature (PCVC)
 - Elevations - shown at BVCs, EVCs, PRVCs, and PCVCs, equations, broken profiles for datum changes, VPIs, and conforms at existing pavement. No additional elevations need be shown on vertical curves
 - Earthwork quantities (listed by station, or individual cuts and fills) – sheet total
 - Top rail elevation (railroad)
 - Station and elevation of begin and end bridge. Identify offset if not on “PG”
 - Label bridge name and number (show bridge number only when work is to be performed on bridge and bridge plans are included)
 - Street or road alignment line and identify the stationing where it crosses the main profile grade line
 - Road and driveways identified where they connect to the affected route
 - Elevation at both edges of sheet (on top of the horizontal grid line) TX=8.75, FT=3, WT=2, CO=0, LV= border_INSIDE-BORDER-anno (60).
 - Plus station for points
 - Station equations
 - Benchmarks (showing an elevation is optional)
- Where the profile and superelevation diagram are shown together do the following:*
- It is a Caltrans best practice to show the superelevation diagram with the corresponding profile. The superelevation diagram must be placed directly above the profile so that the stationing (TX=7.0, WT=1, CO=0, LV= border_INSIDE-BORDER-anno (60)) lines up
 - Stationing is to be shown directly below the superelevation diagram. Station and earthwork quantities (TX=7.0, WT=1, CO=0, LV= border_INSIDE-BORDER-anno (60)) are to be shown below the profile.
 - When the superelevation diagram and profile are on the same sheet, the sheet title is to be “PROFILE AND SUPERELEVATION DIAGRAM.” The sheet Identification is “PS”
 - For specific superelevation diagram elements to be shown, see “Checklist for Superelevation Diagram”

CHECKLIST FOR PROFILE SHEET (Page 2 of 2)

Where the profile is shown by itself or if both profile and superelevation diagram are shown together, include the following information on those sheets:

- District, county and route TX=7.0, FT=3, WT=1, LV=border_PROJ-ID-BLOCK-anno (10) (upper right corner of sheet)
- Post Miles TX=7.0, FT=3, WT=1, LV=border_PROJ-ID-BLOCK-anno (10) (upper right corner of sheet)
- Unit and Project Number and Phase (lower right corner of sheet) TX=7.0, FT=3, WT=1, LV=border_SHEET (10).
- Signature and date of signature are included on LV=border_SIGNATURE
- (63). Current registration seal information is to be included on LV=border_SEAL (10), (upper right corner of sheet). The signature is added as the last step before the project goes to PS&E. The text size for the date and information inside the seal is to be TH=7.0, TW=5.0, FT=3, WT=1, but the width can be squeezed to fit the area. If both names are long, the first name can be above the last name
- Information inserted in plan sheet development name block spaces in left margin of border sheet. See Figures 2-10 and 2-11 in Section 2-1.6 of this manual for additional instructions
- Scale – vertical and horizontal (TX=8.75, FT=3, WT=2, LV=border_INSIDE-BORDER-anno (10)). Place below the sheet name (centered)

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CHECKLIST FOR SUPERELEVATION DIAGRAM (Page 1 of 1)

- Axis of rotation line (0%). Label as “Axis of Rotation” along with the line designation of the PG line and offset to the PG line (if applicable – see generic example 2 of 5)
 - Each traveled way and shoulder plane shown and labeled. DO NOT abbreviate traveled way or shoulder
 - Stationing below diagram (each diagram if stacked)
 - Location of horizontal BCs and ECs indicated with vertical lines. Label radius and direction of curvature above the full superelevation portion of the diagram. A dimension line connects the BC to the EC (see generic example 5 of 5)
 - Percent at both edges of sheet (on top of the horizontal grid line)
 - Station equations
 - Identify (with a triangle) the points of transition (as shown in the Highway Design manual) with the plus stations below the diagram. Do not label these points (see generic example 5 of 5)
 - Identify (with a triangle) and label those rare occurrences such as, “compound curves”, “reversing curves” and “broken back curves”
- Where the superelevation diagrams are shown on their own separate sheets, include the following information on those sheets:*
- District, county and route TX=7.0, FT=3, WT=1, LV=border_PROJ-ID-BLOCK-anno (10) (upper right corner of sheet)
 - Post Miles TX=7.0, FT=3, WT=1, LV=border_PROJ-ID-BLOCK-anno (10) (upper right corner of sheet)
 - Unit and Project Number and Phase (lower right corner of sheet) TX=7.0, FT=3, WT=1, LV=border_SHEET (10).
 - Signature and date of signature are included on LV=border_SIGNATURE (63). Current registration seal information is to be included on border_SEAL (10), (upper right corner of sheet). The signature is added as the last step before the project goes to PS&E. The text size for the date and information inside the seal is to be TH=7, TW=5, FT=3, WT=1, but the width can be squeezed to fit the area. If both names are long, the first name can be above the last name
 - Information inserted in plan sheet development name block spaces in left margin of border sheet. See Figures 2-10 and 2-11 in Section 2-1.6 of this manual for additional instructions
 - Scale – horizontal (TX=8.75, FT=3, WT=2, border_INSIDE-BORDER-anno (10)). Place below the sheet name (centered).

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