

# California High-Speed Train Project



## TECHNICAL MEMORANDUM

### CHSTP Plan Preparation Manual TM 1.1.5.1

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## System Level Technical and Integration Reviews

The purpose of the review is to ensure:

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

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

System Level Technical Reviews by Subsystem:

Systems:	<u>Signed document on file</u> Rick Schmedes	<u>13 Aug 12</u> Date
Infrastructure:	<u>Signed document on file</u> John Chirco, PE	<u>14 April 12</u> Date
Operations:	<u>Signed document on file</u> Joe Metzler	<u>20 March 12</u> Date
Maintenance:	<u>Signed document on file</u> Joe Metzler	<u>20 March 12</u> Date
Rolling Stock:	<u>Signed document on file</u> Frank Banko	<u>2 March 12</u> Date
Project Management Oversight:	<u>Signed document on file</u> Michael D. Lewis, PE	<u>24 June 12</u> Date

Note: Signatures apply for the technical memorandum revision corresponding to revision number in header and as noted on cover.



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## 1.0 GENERAL

### 1.1.1 PURPOSE OF MANUAL

The purpose of this Manual is to provide guidelines for all drawings prepared for the California High-Speed Train Project (CHSTP). This Manual will provide the guidelines that shall be used by all parties involved in the preparation of all civil, structural, roadway, utility and other plans and drawings prepared for the California High-Speed Rail Authority (Authority). Adherence to these guidelines will result in the required level of uniformity and consistency of the drawings all plans.

### 1.2 APPLICATION OF THE PLAN PREPARATION MANUAL

The guidelines provided in this Manual shall be used for all project phases from 15% design through final design and construction. Additionally, all parties who shall use these guidelines include, but are not limited to all regional consultants, the PMT, and the final Designer/Contractor.

### 1.3 DEFINITIONS

As-Built Additional Drawings	Drawings generated during the as-built process indicating new or additional work constructed
As-Built Drawings	Construction Drawings modified to reflect design changes and actual conditions of construction, conformed from field and design changes directly from the Ready for Construction (RFC) drawings
As-Built Revised Drawings	Drawings generated during the as-built process for the purpose of providing clear and concise as-built correction information, but contain with no new or additional work added
Contract Change Order	A written order to the contractor, issued after the execution of the contract, authorizing a change in the work
Contract drawings	Drawings that are specific to the project and contract. Contract drawings include preliminary design drawings and construction drawings.
Construction Drawings	Drawings furnished by the contractor representing the post preliminary design project delivery, from final design through completion of construction. Construction drawings include Final Design drawings, Ready for Construction (RFC) drawings as As-Built drawings.
Contract Number	The number assigned to an individual construction project
Directive Drawings	Directive Drawings provide mandatory design criteria in a graphical format that the Contractor shall follow and apply to ensure consistency during design for system-wide elements and features
Drawing Number	Number found in the titleblock assigned to an preliminary, construction, standard or directive drawings
Preliminary Drawings	Drawings prepared during the preliminary design phase
Preliminary Engineering for Procurement	Preliminary engineering that demonstrate technical feasibility and constructability for procurement



Ready for Construction Drawings (RFC)	Construction drawings designed to 100% that are ready and used during construction. They are the basis for the as-built drawings
Regional Consultant	The consultant selected by the Authority to be responsible for the overall preliminary design of the project
Standard Drawings	Standard project elements for general use in the construction of the California High-Speed Train system, as determined applicable by the Contractor
Title Block	The title block in these guidelines is defined as the lower portion of the drawing containing information such as drawing title, signature blocks, project logos, etc.

## 1.4 USE OF COMPUTER AIDED DESIGN AND DRAFTING (CADD) SOFTWARE

CADD is an integral part of the project delivery process, from preliminary design through the completion of construction and as-built drawings. For drafting and sheet preparation, the CHSTP standard CADD production platform shall be Bentley's MicroStation V8i (Select Series 1 or higher). The CHSTP standard vertical design platform shall be Bentley's Inroads Suite V8i. For additional information regarding CADD software and subsequent computer systems requirements, see Section 1.2 of the CHSTP CADD Manual.

## 1.5 DEVELOPMENT OF ELECTRONIC FILES

Electronic files for all CHST Project design drawings must conform to the following information and developed with the following CADD best practices:

### General

- Use only the "Default" model space. One model per DGN
- Use only CHSTP seed files to create master and sheet files

### Master files

Master files typically contain proposed design information for the design elements of the project. This file can include, but is not limited to features, such as track/road alignments, alignment labels, right-of-way line, and construction features (retaining wall, guard rails, intrusion barriers, et al.). All master files must follow the guidelines below:

- For master files that need to be geo-referenced, use correct seed file from the corresponding State Plane Coordinates system.



### Contract drawings:

Contract drawings are sheet files that are specific to the project and contract. They contain items such as callouts, notes, linework and symbology that define the items of work shown. Specific sheet content, sample plans and checklists are contained in Section 2.5 and Appendix B and C of this Manual.

## **1.6 ELECTRONIC DELIVERY PROCESS**

Information regarding electronic submittals can be found in Section 1.3.7 of the CHSTP CADD Manual.





## 2.0 CONTRACT DRAWINGS

### 2.1 GENERAL PROCEDURES

Contract drawings must be clear and concise in indentifying all items of work that a contractor can interpret and build. All items of work shall use dimensioning and labeling on plan, profile and detail sheets to clearly indentify quantity items. This will ensure that the bidders and contractors are not expected or need to scale quantity items from a hard copy print.

Contract drawings are supplemented by the CHSTP Standard and Directive Drawings. Do not include the drawing of a standard detail as it is already shown on CHSTP Standard Drawings. For more detailed information regarding the use of standard and directive drawings for CHSTP contract drawings, see Section 2.6 of this Manual.

All contract drawings shall utilize the standardized Facility Naming Conventions as detailed in Section 3.0 of this Manual.

### 2.2 DRAFTING STANDARDS

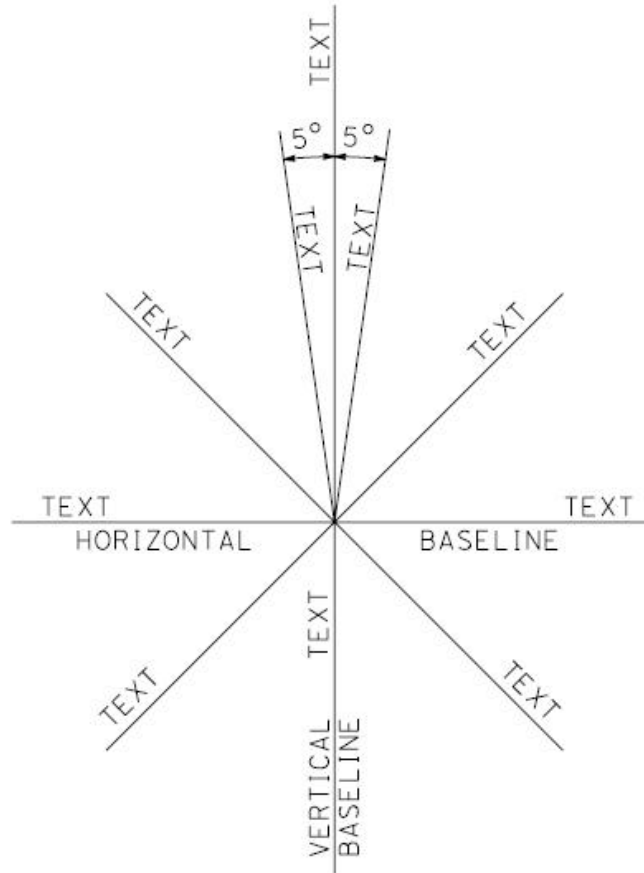
General Drafting Standards to be followed for the creation of contract drawings:

- Lineweight and linestyles shall conform to Section 4.5 and Appendix G of the CHSTP CADD Manual.
- Abbreviations and symbology shall conform to the CHSTP Acronyms and Abbreviations, and Symbols Directive Drawings
- Text height shall conform to Section 4.3 of the CHSTP CADD Manual. Project requires the use of uppercase characters for all text and dimensioning found within the contract drawings.
- The placement and rotation of text shall conform to Section 2.2.1 of this Manual. All project plan notes shall be placed in the upper right hand corner of the sheet whenever possible to allow consistency of all contract drawings. Topographical information shall be masked underneath the notes to provide additional clarity for the information shown on the project plan.
- Placement of text shall not interfere with other text, cross linework or dimensions. The use of text mask is allowable and recommended whenever possible to provide additional clarity for the information shown on the project plan.
- Sheet match lines shall be perpendicular to the alignment line. Alignment annotation shall be clipped out if it interferes with the Matchline cell.
- Leaders and callouts shall be shown with arrowheads and straight leader lines to allow for consistency of all contract drawings. The use of curved leaders is not allowable.



### 2.2.1 TEXT ROTATION AND PLACEMENT

Text placement and rotation shall be consistent throughout all CHSTP contract drawings. To ensure consistency is met, text placement and rotation shall be as shown in the example below:



Text orientation shown with 5° of the vertical baseline is up to the discretion of the project plan preparer. Be consistent on all contract drawings.



## 2.3 U.S. CUSTOMARY UNITS

### 2.3.1 DIMENSIONS

The use of decimal feet versus feet and inches shall be based upon of the item of work. The following parameters shall be followed for the various prepared CHTSP design drawings:

#### General Dimension Guidelines

- Civil plans, including track, grading, drainage and utility plans: Decimal feet
- Sections and details within civil plans: Feet and inches
- Structural, architectural, mechanical, traction power, overhead catenary, train control, track work and electrical drawings, sections, and details: Feet and inches
- Dimension text shall always be parallel and above the dimension line

#### Specific Items of Work Values:

- Pavement structures and depths: Feet and Inches. When pavement depth is less than one foot, the depth can be expressed in inches only (i.e., 6" AB).
- Formed concrete construction features (bridges, walls, drainage features, curbs, sidewalks, etc.): Feet, inches and fractions of inches.
- Manufactured or fabricated items (generally): Feet, inches and fractions of inches.
- Surface cross slopes and superelevations: Percents, with the exception of sub-ballast cross slopes which shall be presented as a ratio of 24:1
- Pipe / Ditch slopes: Shown as decimal value. (i.e., 0.005).
- Side slopes: Non-dimensional ratio with the horizontal component shown first and then the vertical (X:Y). When the side slope becomes steeper than 1:1, the horizontal component is shown as a fraction (i.e.,  $\frac{3}{4}$ :1).
- Flares and tapers: Non-dimensional ratio with the longitudinal component shown first and then the lateral offset component (i.e., 20:1, 15:1).
- All dimensions in feet, tenth of a foot or hundreds of a foot shall be shown with a universal foot symbol (apostrophe) as a suffix. For dimensions less than one foot, a zero shall be placed in front of the decimal (i.e., 0.25').
- All dimensions in inches shall be shown with the universal inch symbol (quotation mark). When the dimension is one foot or greater, a hyphen is placed to separate the foot and inches values with no space before or after the hyphen (i.e., 1'-6". When the dimension is less than one foot, a zero or hyphen designation is not required to lead the inch value. (i.e., 6", not 0'-6"). Fractions of an inch shall be shown as a stacked fraction (i.e., 10  $\frac{1}{2}$ ").
- Additionally, the CHTSP standard details shall be used as a guide to determine when dimensioning standards shall be decimal feet or feet and inches.

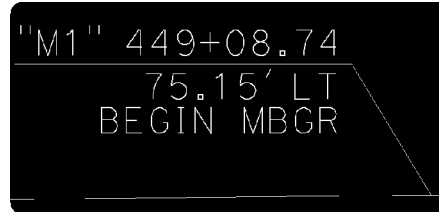
For design drawings specifically prepared for state highway facilities, the standards set forth in Section 2-1.3 U.S. Customary Units Standard in the Caltrans Plan Preparation Manual shall be followed. See the link below:

<http://www.dot.ca.gov/hq/oppd/cadd/usta/ppman/2-1.pdf>



### 2.3.2 LOCATION OF CONSTRUCTION FEATURES (STATION / OFFSET)

All construction features shall be located using stationing and, as applicable to the item of work, offset distances to an established station line. Offset distances from a station line shall include a foot symbol suffix (apostrophe). Exceptions to the above standard are instances in which construction items are located by post mile or from fixed objects.



### 2.3.3 ACCURACY / PRECISION

Accuracy to the nearest foot, tenth of a foot, or hundreds of a foot, is dependent on the located construction feature.

- Elevations, distances and dimensions in decimal feet are provided to two decimal places. Accompanying foot symbols are not required for spot elevation or datum elevations (i.e., Elevation: 654.54)
- Contour lines shall be rounded to the nearest whole number. No foot symbol is required.
- Horizontal coordinates (northings and eastings) are provided to three decimal places (i.e., 2044643.712, 6016950.302).
- Bearings for all alignment geometry shall be expressed in degree, minutes and seconds with the N (northing) prefix and E (easting) suffix (i.e., N 70°35'32.5" E).
- Angles shall also be shown in degrees, minutes and second (i.e., 48° 38'18")
- Dimensions expressed in feet and inches shall be given to the nearest 1/8" or as appropriate. (1-1/8").
- For station/offset callouts, the accuracy shall match the examples shown below:
  - Stationing: 180+45.15 / Offset: 74.15' LT or RT
- All other quantities such as volume, weight, slope, et al., shall be expressed with an appropriate level of precision.



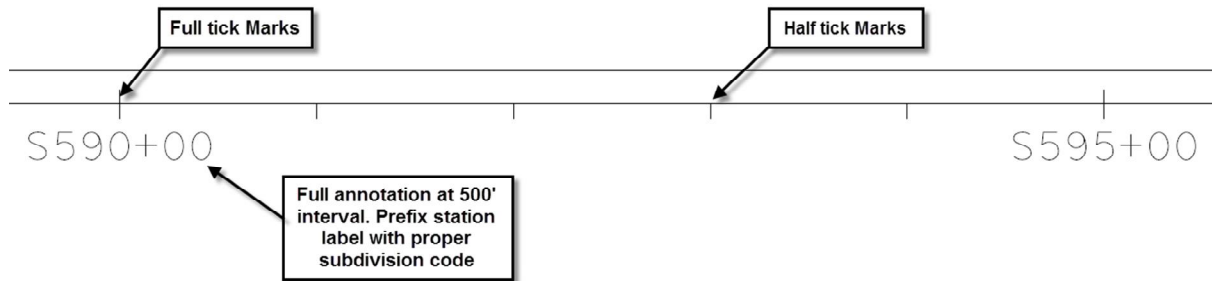
**2.3.4 STATIONING**

Stationing shall be based upon scale. For 50 scale or greater, stationing shall be based upon 100 foot stationing with full annotation at 500' stations. Annotation at 100 foot intervals shall be a half tick mark only. 500' interval shall show a full tick mark and station label. For scale less than 50 scale, stationing shall be based upon 100 foot stationing with full annotation at 100' stations. Annotation at 100 foot intervals shall be shown as a full tick mark and station label. Half size tick mark shall be 0.1' at 1:1 scale, 0.2' for full size tick marks at 1:1 scale

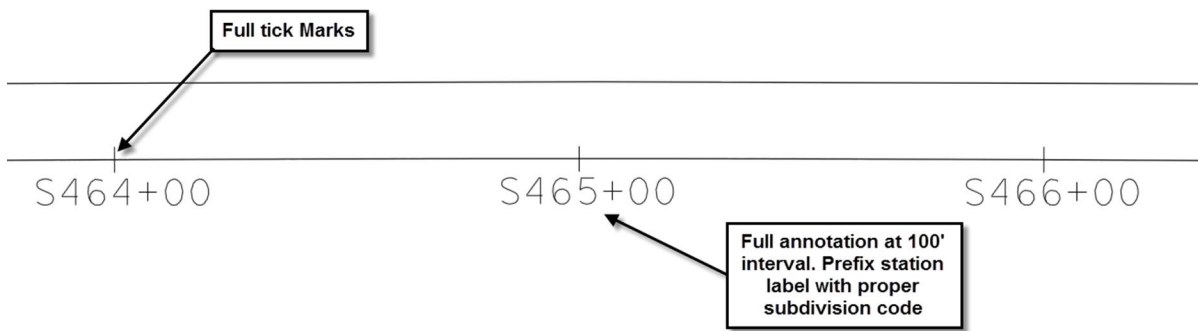
Each station label shall have the subdivision code prefix. See Section 3.1.1 of this Manual for a complete list of CHSTP subdivision code.

See example below

**Stationing (50' scale or greater)**



**Stationing (Less than 50' scale)**

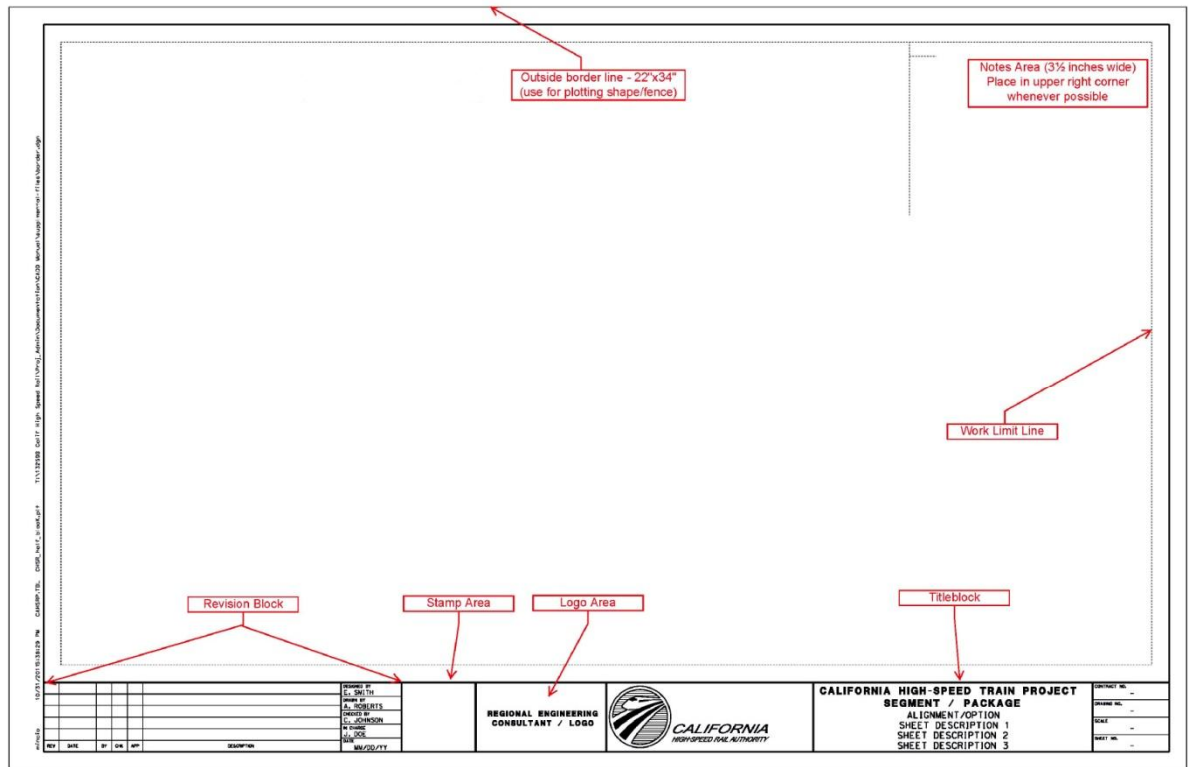


## 2.4 Plan Sheet Borders

CHSTP borders shall be used for all contract drawings preparation.

### General Border Guidelines

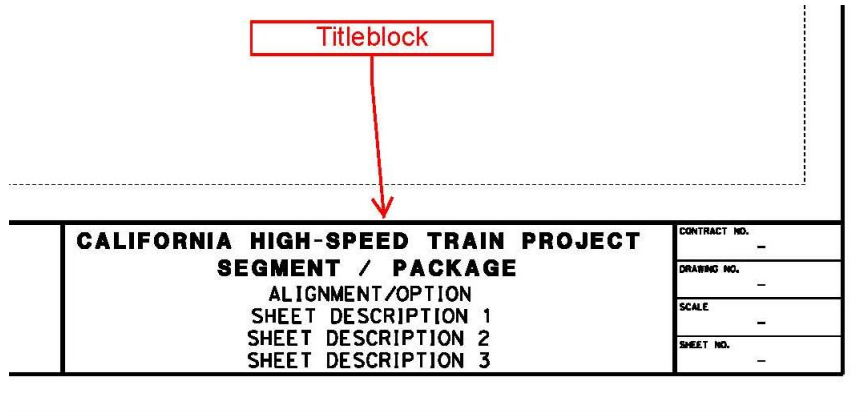
- Outside border line for full size plot
- The CHSTP border has a work limit line on Level 64 No Plot. Never extend the drawing, details and notes beyond work limit line.
- With the exception of adding a company logo, the border shall not be edited/revised.



Access to the CHSTP borders can be found at the link shown below:



**2.4.1 TITLEBLOCK**

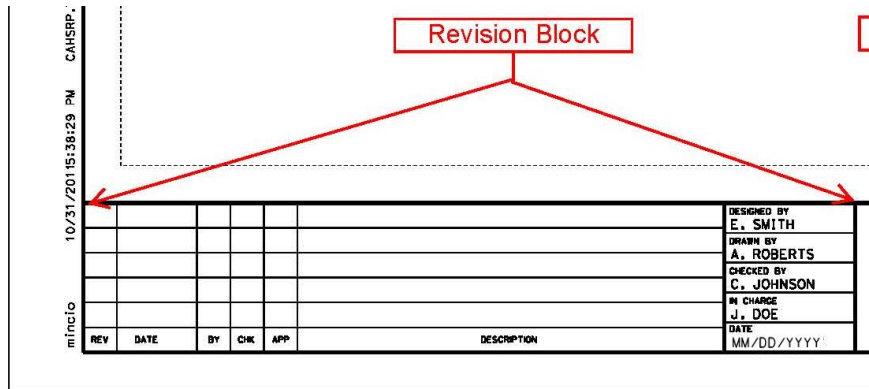


General Titleblock Guidelines

- Titleblock tags shall be placed in the drawing using the “titleblock” cell in the CHSTP cell library.
- Segment designation shall be placed in the titleblock during 15% design. Subdivision Package designation shall be placed during Preliminary Engineering for Procurement design. The subdivision package designation shall remain through the completion of the as-built drawings for the same contract.
- The Sheet number tag shall not be populated during 15% and Preliminary Engineering for Procurement submittal. Sheet number information shall be required for construction drawings and as-built drawings.



### 2.4.2 REVISION BLOCK



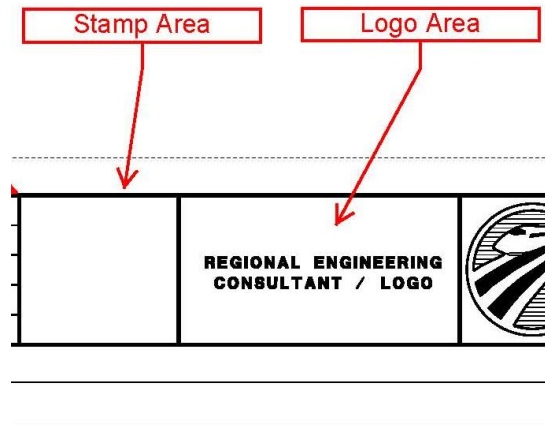
#### General Revision Block Guidelines

- Revision Block tags shall be placed in the drawing using the “titleblock” cell in the CHSTP cell library.
- Revision block shall remain blank during 15% and Preliminary Engineering for Procurement design. The construction drawings and as-built drawings shall have the revision block populated as needed.
- Names shall be shown as first initial (period) (space) last name.
- Date shall be month, day and year format (MM/DD/YYYY).





### 2.4.3 STAMP AND LOGO AREA



#### Stamp Area

During preliminary design, stamps shall be placed in the drawings by using the levels defined in the CHSTP dgnlib. The levels are defined for each submittal, from 15% through Preliminary Engineering for Procurement. Level display will be dictated by submittals defined in Levels 75-80. See Appendix B of the CHSTP CADD Manual for additional information regarding the seal/signature area of the border.

#### Logo Area

The logo area is user defined. Company logos can be placed in the area for plan preparation. Logos cannot be placed anywhere else in the border.

### 2.4.4 SEAL AND SIGNATURE INFORMATION

Engineering seals and signature shall not be placed in the stamp area during the preliminary design phase. With the exception of survey data control sheets, no seal or signatures shall be required for 15%, Preliminary Engineering for Procurement drawings.

A seal and electronic signature by a licensed land surveyor is required for the survey data control sheets during Preliminary Engineering for Procurement. See Section 4.1.2 of this Manual for signature and seal requirements for construction drawings. A seal and electronic signature by a licensed professional is required for the Ready for Construction (RFC) and As-Built drawings.



## 2.5 Contract Drawings Submittals

### 2.5.1 PRELIMINARY DESIGN DRAWINGS (PRELIMINARY ENGINEERING FOR PROCUREMENT)

Preliminary Design Drawings prepared for Preliminary Engineering for Procurement submittals included, but are not limited to, the drawings shown in the below chart. They shall be grouped into volumes based upon discipline. Checklist and Sample plans can be found in Appendix B and C of this document.

Plan	Scale (Full Size)	
<b>VOLUME 1 - GENERAL and TRACK GUIDEWAY</b>		
<b>VOLUME 1A - GENERAL</b>		
TITLE SHEET - VICINITY MAP - GENERAL NOTES	NO SCALE	
GENERAL / TRACK GUIDEWAY – INDEX OF DRAWINGS	NO SCALE	
GENERAL - SURVEY CONTROL DATA	1"=100' / ENLARGED DETAILS AS NEEDED	
<b>VOLUME 1B - TRACK GUIDEWAY</b>		
TRACK GUIDEWAY- GENERAL NOTES	NO SCALE	
TRACK GUIDEWAY - TYPICAL SECTIONS	1" = 10'	
TRACK GUIDEWAY - KEY MAP	VARIABLES	
TRACK GUIDEWAY - HORIZONTAL ALIGNMENT DATA TABLE	NO SCALE	
TRACK GUIDEWAY - PLAN AND PROFILE	1"=100'	
<b>VOLUME 2 - TRACK STRUCTURES</b>		
TRACK STRUCTURES - INDEX OF DRAWINGS	NO SCALE	
TRACK STRUCTURES - GENERAL NOTES	NO SCALE	
TRACK STRUCTURES - KEY MAP	VARIABLES	
TRACK STRUCTURES - TYPICAL SECTIONS (AERIAL /TUNNELS)	1" = 10'	
TRACK STRUCTURES - TRACK STRUCTURAL PLAN (AERIAL STRUCTURES)	<i>TOP OF RAIL</i>	NO SCALE
	<i>ELEVATION</i>	1" = 40'
	<i>PLAN</i>	1" = 40'
TRACK STRUCTURES - TRACK STRUCTURAL PLAN (TUNNEL STRUCTURES)	<i>TOP OF RAIL</i>	NO SCALE
	<i>ELEVATION</i>	1" = 40'
	<i>PLAN</i>	1" = 40'



TRACK STRUCTURES - DRAFT GENERAL PLAN (SMALL STRS)	<i>TOP OF RAIL ELEVATION</i>	NO SCALE
	<i>PLAN</i>	MATCH PLAN 1" = 20', 1" = 30 or 1" = 40' (DETERMINED BY SIZE OF STRUCTURE)
		<i>TYPICAL SECTION</i>
	<i>RETAINING WALL (ID, LENGTH, AVERAGE HEIGHT)</i>	NO SCALE
	<b>VOLUME 3 - ROADWAY</b>	
	ROADWAY - INDEX OF DRAWINGS	NO SCALE
ROADWAY - GENERAL NOTES	NO SCALE	
ROADWAY - INDEX MAP	VARIES	
ROADWAY - GRADE SEPARATION - "STREET NAME"		
<i>PLAN</i>	1" = 100'	
<i>PROFILE</i>	H: 1" = 100' ; V: 1"=10'	
<i>TYPICAL SECTION</i>	1" = 10'	
<i>ALIGNMENT CURVE DATA</i>	NO SCALE	
<i>RETAINING WALL (ID, LENGTH, AVERAGE HEIGHT)</i>	NO SCALE	
ROADWAY – "STREET NAME" - DRAFT GENERAL PLAN		
<i>PROFILE GRADE ELEVATION</i>	NO SCALE	
<i>PLAN</i>	1" = 20'	
<i>TYPICAL SECTION</i>	1" = 10'	
<i>RETAINING WALL (ID, LENGTH, AVERAGE HEIGHT)</i>	NO SCALE	
<b>VOLUME 4 - UTILITIES</b>		
UTILITIES - INDEX OF DRAWINGS	NO SCALE	
UTILITIES - GENERAL NOTES	NO SCALE	
UTILITIES – COMPOSITE UTILITY PLANS - KEY MAP	VARIES	
UTILITIES - UTILITY COMPOSITE PLAN - ALONG TRACK ALIGNMENT	1" = 100'	
UTILITIES - UTILITY PROTECTION & RELOCATION - PLAN AND PROFILE	1"=50'	
<i>FOR HIGH RISK UTILITIES AS NEEDED, AT CRITICAL AREAS, PINCH POINTS</i>	-	
<i>AS NEEDED, AT CRITICAL AREAS, PINCH POINTS</i>	-	
UTILITIES - GRADING AND DRAINAGE - KEY MAP	VARIES	
UTILITIES - GRADING AND DRAINAGE PLANS - ALONG TRACK ALIGNMENT	1" = 100'	
UTILITIES - GRADING AND DRAINAGE DETAILS	1"=50'	
<i>AS NEEDED, AT CRITICAL AREAS, PINCH POINTS</i>	-	



## 2.5.2 CONSTRUCTION DRAWINGS (DESIGN BASELINE REPORT)

Construction Drawings prepared by the contractor during final design for the Design Baseline Report submittal includes, but are not limited to, the drawings shown in the below chart.

Plan	Scale (Full Size)
TITLE SHEET	NO SCALE
INDEX OF DRAWINGS	NO SCALE
TRACK CIVIL - TYPICAL SECTIONS	NO SCALE
TRACK GUIDEWAY - PLAN AND PROFILE	-
<i>PLAN</i>	1" = 100'
<i>PROFILE</i>	H: 1" = 100' ; V: 1"=10'
TRACK STRUCTURES - TYPICAL SECTIONS (AERIAL /TUNNEL STRUCTURES)	1" = 10'
TRACK STRUCTURAL PLAN (AERIAL/TUNNEL STRUCTURES)	-
<i>TOP OF RAIL</i>	NO SCALE
<i>ELEVATION</i>	1" = 40'
<i>PLAN</i>	1" = 40'
TRACK STRUCTURAL - GENERAL PLAN (SMALL STRUCTURES)	-
<i>TOP OF RAIL</i>	NO SCALE
<i>ELEVATION</i>	MATCH PLAN
<i>PLAN</i>	1" = 20' , 1" = 30 or 1" = 40' (DETERMINED BY SIZE OF STRUCTURE)
<i>TYPICAL SECTION</i>	1" = 10'
<i>RETAINING WALL (ID, LENGTH, AVERAGE HEIGHT)</i>	NO SCALE
TRACK STRUCTURES - RETAINING WALL - PLAN AND PROFILE	-
<i>PLAN</i>	1" = 50'
<i>PROFILE</i>	H: 1" = 50' ; V: 1"=10'
ROADWAY CIVIL* (SEE NOTE 1) - GRADE SEPARATION - "STREET NAME"	-
<i>PLAN</i>	1" = 50'
<i>PROFILE</i>	H: 1" = 50' ; V: 1"=10'
<i>TYPICAL SECTION</i>	1" = 10'
<i>ALIGNMENT CURVE DATA</i>	NO SCALE
<i>RETAINING WALL (ID, LENGTH, AVERAGE HEIGHT)</i>	NO SCALE
ROADWAY STRUCTURES* (SEE NOTE 1) - GENERAL PLAN	-
<i>PROFILE GRADE</i>	NO SCALE
<i>ELEVATION</i>	MATCH PLAN
<i>PLAN</i>	1" = 20' , 1" = 30 or 1" = 40' (DETERMINED BY SIZE OF STRUCTURE)
<i>TYPICAL SECTION</i>	1" = 10'
<i>RETAINING WALL (ID, LENGTH, AVERAGE HEIGHT)</i>	NO SCALE
COMPOSITE UTILITY PLAN	1" = 100'
<i>FOR EXISTING, PROPOSED AND RELOCATED UTILITIES</i>	-



## GEOMETRIC APPROVAL DRAWINGS

\*SEE NOTE 1

*\* NOTE 1:*

*GEOMETRIC APPROVED DRAWINGS, ROADWAY CIVIL AND ROADWAY STRUCTURAL DRAWINGS UNDER STATE OR THIRD PARTY JURISDICTION SHALL FOLLOW CALTRANS OR THIRD PARTY STANDARDS.*



### 2.5.3 CONSTRUCTION DRAWINGS (CHSTP DESIGN SUBMITTALS, READY FOR CONSTRUCTION (RFC) SUBMITTALS AND AS-BUILT SUBMITTALS)

Construction Drawings prepared by the contractor during final design submittals include, but are not limited to, the drawings shown in the below chart. Final design submittals include CHSTP Design Submittals, Ready for Construction (RFC) submittals and As-Built submittals.

Plan* (See Note 1)	Scale (Full size)
<b>GENERAL</b>	
TITLE SHEET	NO SCALE
INDEX OF DRAWINGS	NO SCALE
FACILITY LOCATION MAP	NO SCALE
<b>SURVEY</b>	
SURVEY - GENERAL NOTES	NO SCALE
SURVEY - SURVEY DATA CONTROL PLANS	1" = 50'
<b>TRACK CIVIL</b>	
TRACK CIVIL - GENERAL NOTES	NO SCALE
TRACK CIVIL - EXISTING TOPOGRAPHY AND DEMOLITION PLANS	1"=50'
TRACK CIVIL - TRACK ALIGNMENT - TYPICAL SECTIONS	1" = 10'
TRACK CIVIL - TRACK ALIGNMENT - KEY MAP	VARIES
TRACK CIVIL - TRACK ALIGNMENT - HORIZONTAL ALIGNMENT DATA TABLE	NO SCALE
TRACK CIVIL - TRACK ALIGNMENT - PLAN AND PROFILE	-
	PLAN 1" = 50'
	PROFILE H: 1" = 50' ; V: 1"=10'
TRACK CIVIL - TRACK ALIGNMENT DETAILS	VARIES
TRACK CIVIL - GRADING AND DRAINAGE PLAN	1" = 50'
TRACK CIVIL - DRAINAGE SECTION AND DETAILS	VARIES
TRACK CIVIL - TEMPORARY WATER POLLUTION PREVENTION PLANS	1"=50'
TRACK CIVIL - TEMPORARY WATER POLLUTION PREVENTION DETAILS	VARIES
TRACK CIVIL - EROSION CONTROL PLANS	1"=50'
TRACK CIVIL - EROSION CONTROL DETAILS	VARIES
TRACK CIVIL - WATER POLLUTION PREVENTION PLANS	1"=50'
TRACK CIVIL - WATER POLLUTION PREVENTION DETAILS	VARIES
TRACK CIVIL - STAGE CONSTRUCTION PLAN	1"=100' OR 1"=200'
TRACK CIVIL - STAGE CONSTRUCTION DETAILS	VARIES
TRACK CIVIL - TRAFFIC HANDLING PLAN	1"=100' OR 1"=200'
TRACK CIVIL - TRAFFIC HANDLING DETAILS	VARIES
<b>TRACKWORK</b>	
TRACKWORK - GENERAL NOTES	NO SCALE
TRACKWORK - TRACK CHART	NO SCALE
TRACKWORK - MAINTENANCE-OF-WAY ACCESS PLAN	1" = 20'
TRACKWORK - MAINTENANCE-OF-WAY ACCESS DETAILS	VARIES



<b>TRACK STRUCTURES</b>		
TRACK STRUCTURES - GENERAL NOTES		NO SCALE
TRACK STRUCTURES - KEY MAP		VARIES
TRACK STRUCTURES - INDEX MAP		VARIES
TRACK STRUCTURES - RETAINING WALL - PLAN AND PROFILE		-
	<i>PLAN</i>	1" = 50'
	<i>PROFILE</i>	H: 1" = 50' ; V: 1"=10'
TRACK STRUCTURES - RETAINING WALL - DETAILS		VARIES
TRACK STRUCTURES - TYPICAL SECTIONS (AERIAL/TUNNEL STRUCTURES)		1" = 10'
TRACK STRUCTURAL PLAN (AERIAL/TUNNEL STRUCTURES)		-
	<i>TOP OF RAIL</i>	NO SCALE
	<i>ELEVATION</i>	1" =20'
	<i>PLAN</i>	1" = 20'
TRACK STRUCTURAL - GENERAL PLAN (SMALL STRUCTURES)		-
	<i>TOP OF RAIL</i>	NO SCALE
	<i>ELEVATION</i>	MATCH PLAN
		1" = 20' , 1" = 30 or 1" = 40' (DETERMINED BY SIZE OF STRUCTURE)
	<i>PLAN</i>	
	<i>TYPICAL SECTION</i>	1" = 10'
TRACK STRUCTURES - FOUNDATION PLAN		DETERMINED BY SIZE OF STRUCTURE
TRACK STRUCTURES - FOUNDATION DETAILS		VARIES
TRACK STRUCTURES - ABUTMENT PLAN AND ELEVATION		-
	<i>ELEVATION</i>	MATCH PLAN
		DETERMINED BY SIZE OF STRUCTURE
	<i>PLAN</i>	
TRACK STRUCTURES - ABUTMENT DETAILS		VARIES
TRACK STRUCTURES - PIER PLAN AND ELEVATION		-
	<i>ELEVATION</i>	MATCH PLAN
		DETERMINED BY SIZE OF STRUCTURE
	<i>PLAN</i>	
TRACK STRUCTURES - PIER DETAILS		VARIES
TRACK STRUCTURES - GIRDER DETAILS		DETERMINED BY SIZE OF STRUCTURE
TRACK STRUCTURES - GIRDER FRAMING PLAN		VARIES
TRACK STRUCTURES - BEARING DETAILS		VARIES
TRACK STRUCTURES - EXPANSION JOINT DETAILS		VARIES
TRACK STRUCTURES - DECK DRAINAGE DETAILS		VARIES
TRACK STRUCTURES - LOG OF TEST BORINGS		VARIES



<b>ROADWAY CIVIL (**See Note 2)</b>		
ROADWAY CIVIL - GENERAL NOTES		NO SCALE
ROADWAY CIVIL - INDEX MAP		VARIABLES
ROADWAY CIVIL - EXISTING TOPOGRAPHY AND DEMOLITION PLANS		1"=50'
ROADWAY CIVIL - TYPICAL SECTIONS		1" = 10'
ROADWAY CIVIL - GRADE SEPARATION - "STREET NAME"		-
	<i>PLAN</i>	1" = 50'
	<i>PROFILE</i>	H: 1" = 50' ; V: 1"=10'
	<i>TYPICAL SECTION</i>	1" = 10'
	<i>ALIGNMENT CURVE DATA</i>	NO SCALE
	<i>RETAINING WALL (ID, LENGTH, AVERAGE HEIGHT)</i>	NO SCALE
ROADWAY CIVIL - GRADING AND DRAINAGE PLAN		1" = 50'
ROADWAY CIVIL - DRAINAGE SECTION AND DETAILS		VARIABLES
ROADWAY CIVIL - TEMPORARY WATER POLLUTION PREVENTION PLANS		1"=50'
ROADWAY CIVIL - TEMPORARY WATER POLLUTION PREVENTION DETAILS		VARIABLES
ROADWAY CIVIL - EROSION CONTROL PLANS		1"=50'
ROADWAY CIVIL - EROSION CONTROL DETAILS		VARIABLES
ROADWAY CIVIL - WATER POLLUTION PREVENTION PLANS		1"=50'
ROADWAY CIVIL - WATER POLLUTION PREVENTION DETAILS		VARIABLES
ROADWAY CIVIL - STAGE CONSTRUCTION PLAN		1"=100' OR 1"=200'
ROADWAY CIVIL - STAGE CONSTRUCTION DETAILS		VARIABLES
ROADWAY CIVIL - TRAFFIC HANDLING PLAN		1"=100' OR 1"=200'
ROADWAY CIVIL - TRAFFIC HANDLING DETAILS		VARIABLES
ROADWAY CIVIL - SIGN PLANS		1"=50'
ROADWAY CIVIL - SIGN DETAILS		VARIABLES
<b>ROADWAY STRUCTURES (**See Note 2)</b>		
ROADWAY STRUCTURES - GENERAL NOTES		NO SCALE
ROADWAY STRUCTURES - GENERAL PLAN		-
	<i>PROFILE GRADE ELEVATION</i>	NO SCALE
	<i>PLAN</i>	MATCH PLAN
	<i>TYPICAL SECTION</i>	1" = 20' , 1" = 30 or 1" = 40' (DETERMINED BY SIZE OF STRUCTURE)
	<i>RETAINING WALL (ID, LENGTH, AVERAGE HEIGHT)</i>	1" = 10'
		NO SCALE
ROADWAY STRUCTURES - FOUNDATION PLAN		DETERMINED BY SIZE OF STRUCTURE
ROADWAY STRUCTURES - FOUNDATION DETAILS		VARIABLES
ROADWAY STRUCTURES - ABUTMENT PLAN AND ELEVATION		-
	<i>ELEVATION</i>	MATCH PLAN
	<i>PLAN</i>	DETERMINED BY SIZE OF STRUCTURE





ROADWAY STRUCTURES - ABUTMENT DETAILS	VARIES
ROADWAY STRUCTURES - PIER PLAN AND ELEVATION	-
<i>ELEVATION</i>	MATCH PLAN
<i>PLAN</i>	DETERMINED BY SIZE OF STRUCTURE
ROADWAY STRUCTURES - PIER DETAILS	VARIES
ROADWAY STRUCTURES - GIRDER FRAMING PLAN	DETERMINED BY SIZE OF STRUCTURE
	VARIES
ROADWAY STRUCTURES - BEARING DETAILS	VARIES
ROADWAY STRUCTURES - EXPANSION JOINT DETAILS	VARIES
ROADWAY STRUCTURES - DECK CONTOURS	DETERMINED BY SIZE OF STRUCTURE
ROADWAY STRUCTURES - DECK DRAINAGE DETAILS	VARIES
ROADWAY STRUCTURES - LOG OF TEST BORINGS	VARIES
<b>UTILITIES</b>	
UTILITIES - GENERAL NOTES	NO SCALE
UTILITIES - KEY MAP	VARIES
UTILITIES - UTILITY COMPOSITE PLAN - ALONG TRACK ALIGNMENT	1" = 50'
<i>FOR EXISTING, PROPOSED AND RELOCATED UTILITIES</i>	
UTILITIES - UTILITY COMPOSITE PLAN - AT ROADWAYS	1" = 50'
<i>FOR EXISTING, PROPOSED AND RELOCATED UTILITIES</i>	-
UTILITIES - UTILITY PROTECTION & RELOCATION PLAN AND PROFILE	-
<i>FOR HIGH RISK UTILITIES AND AT CRITICAL AREAS, PINCH POINTS AS NEEDED</i>	-
<i>PLAN</i>	1" = 50'
<i>PROFILE</i>	H: 1" = 50' ; V: 1"=10'
UTILITY DETAILS	VARIES
<b>TRACTION POWER</b>	
TRACTION POWER - GENERAL NOTES	NO SCALE
TRACTION POWER - KEY MAP	VARIES
TRACTION POWER - UNDERTRACK DUCT BANK PLAN	-
<i>FOR UNDERTRACK DUCT BANKS AND MANHOLES LOCATIONS</i>	-
<i>PLAN</i>	1" = 20'
<i>PROFILE</i>	H: 1" = 20' ; V: 1"=10'
TRACTION POWER - GROUNDING AND BONDING TYPICAL SECTIONS	1" = 10'

**\* NOTE 1:**

PLANS VARY BY CONTRACT SUBMITTALS. CONTRACTOR SHALL SUBMIT DRAWING PACKAGE LIST TO THE AUTHORITY FOR APPROVAL



**\*\* NOTE 2:**

ROADWAY CIVIL AND STRUCTURAL PLANS UNDER STATE OR THIRD PARTY JURISDICTION SHALL FOLLOW CALTRANS OR THIRD PARTY STANDARDS

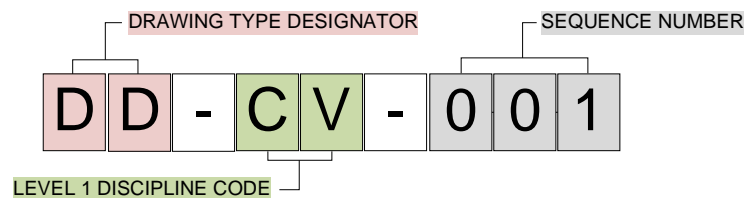
## 2.5.4 PROJECT PLAN FILE FORMAT

The drawing file format for the project shall be DGN only. Any file that is created in DWG or DXF format must be converted into DGN using the correct seed files, levels and symbology. See Section 1.3.7 of the CHSTP CADD Manual for electronic copies deliverable information. See Section 2.10 of the CHSTP CADD Manual for project seed file information. See Section 4.0 of the CHSTP CADD Manual for level and symbology requirements.

## 2.6 USE OF STANDARD AND DIRECTIVE DRAWINGS

Standard and Directive Drawings supplement the contract drawings and assist in the design of the contract work. Standard and Directive drawings are approved details and design guidance by the Authority that are applicable to the construction of track, system, and civil facilities.

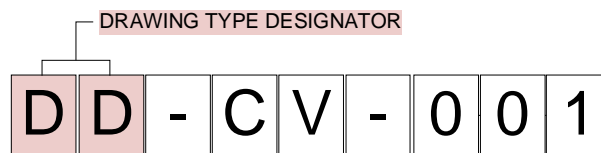
Standard and Directive Drawings are divided into categories by an alpha prefix and level 1 discipline code. The file naming convention, which matches the drawing number, is shown below:



*Example:*

Directive Drawings, Civil, Sequence number 001

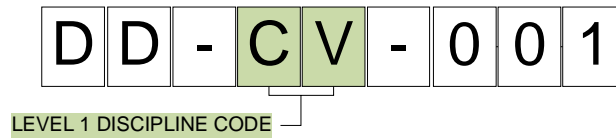
Drawing Type Designator



There are two drawing types – DD and SD. DD stands for Directive Drawing and SD stands for Standard Drawing. See Section 1.3 of this Manual for more detailed definitions of the standard and directive drawings.



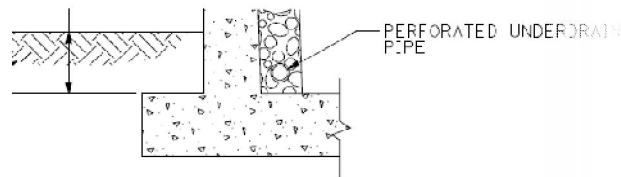
## Level 1 Discipline Code



The 3<sup>rd</sup> and 4<sup>th</sup> characters are the discipline codes. Most are inclusive of the discipline codes defined in Appendix C of the CHSTP CADD Manual. The discipline codes for the standard and directive drawings are as follows:

- AR - Architecture
- CD – Drainage
- CO – Communications
- CV – Civil
- GE- General
- IP – Intrusion Protection
- OC – Overhead Contact System
- ST – Structures
- SY – Systems
- TC – Train Control
- TN – Tunnels
- TP – Traction Power
- TT – Track
- UT – Utility
- VS – Survey

Do not include the drawing of a standard detail in a drawing submittal as it is already shown on a CHSTP Standard Drawing. The contract drawings need only to callout the name and drawing number of the particular standard detail. Unsigned DGNs for the standard drawings shall be made available if the standard detail needs to be modified and included in the plan set. Only the individual modified detail, not the entire standard drawing itself, shall be included in the project plan. The contract drawings containing individual modified details (s) from any CHSTP Standard Drawing shall be signed by the licensed engineer designated on the project plan. If only minimal modifications are made to the standard detail, show the modification only with a reference back to the applicable standard drawings. Any modified details shown on contract drawings shall be labeled “MODIFIED” as shown below



**RETAINING WALL DRAINAGE  
(MODIFIED)**



## 3.0 FACILITY NAMING CONVENTIONS

The following facilities naming convention shall be used for Preliminary Engineering for Procurement Design deliverables, and all final design and construction drawings. The naming convention provides consistency for CHSTP facilities throughout the entire project. See Appendix A of this Manual for Facility Naming Convention Summary Table

### 3.1.1 SUBDIVISIONS

It is standard U.S. railroads practice that large track systems are traditionally divided into manageable sections called branches or subdivisions. This is vital in enabling the location of trains, physical plant and assets, and to define right-of-way maintenance sections.

It is proposed that the CHSTP be apportioned into seven “subdivisions”. A single alpha character shall used to identify each subdivision:








B	Bay Subdivision	–	Extends from San Francisco to CP Divide
S	Sierra Subdivision	–	Extends from CP Divide to Bakersfield
D	Desert Subdivision	–	Extends from Bakersfield to Los Angeles
T	Tongva Subdivision	–	Extends from Los Angeles to Anaheim
C	Capitol Subdivision	–	Extends from CP Divide to Sacramento
J	San Jacinto Subdivision	–	Extends from CP Inland Junction to San Diego
P	Pacheco Subdivision	–	Extends from CP San Joaquin to CP Merced

### 3.1.2 MILEPOSTS

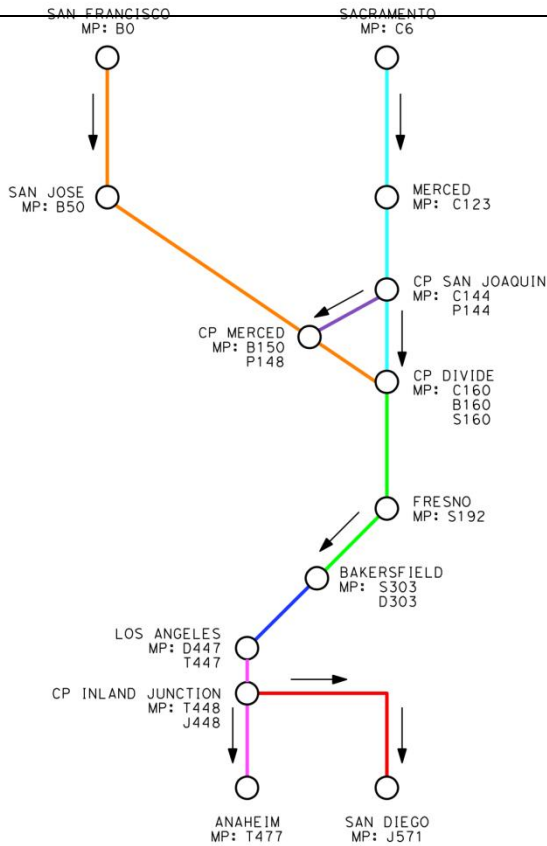
In accordance with the majority of U.S. railroads, the “initial” mile post (MP) on the system is designated 0.0 beginning at the initial subdivision.

It is proposed that the CHSTP’s, Bay Subdivision begin at milepost 0.0 in San Francisco prefixed with the initial letter designation of the subdivision where the milepost is located. It is further proposed that all subsequent high-speed corridor extensions (links to Sacramento and San Diego) begin at the milepost located at the junction where the extensions connect to the primary corridor “spine” of San Francisco-Los Angeles-Anaheim, and increasing mileposts from North to South. Refer to Figure 1.

#### LEGEND

	BAY SUBDIVISION (B)
	SIERRA SUBDIVISION (S)
	DESERT SUBDIVISION (D)
	TONGA SUBDIVISION (T)
	CAPITAL SUBDIVISION (C)
	SAN JACINTO SUBDIVISION (J)
	PACHECO SUBDIVISION (P)





**Figure 1 – Milepost and Stationing**

	Milepost <sup>(1)</sup>		Stationing <sup>(1)</sup>	
	Approx.	Equality	Approx.	Equality
San Francisco	B0		B100+00	
San Jose	B50		B2800+00	
CP Merced	B150	P148	B8100+00	P8300+00
CP Divide	B160	C160 S160	B9000+00	C9000+00 S9000+00
Fresno	S192		S11000+00	
Bakersfield	S303	D303	S17000+00	D17000+00
Los Angeles	D447	T447	D23710+00	T23710+00
CP Inland Junction	T448	J448	T23760+00	J23760+00
Anaheim	T477		T26000+00	
Sacramento	C6		C500+00	
Merced	C123		C7000+00	
CP San Joaquin	C144	P144	C8000+00	P8000+00
San Diego	J571		J31000+00	

(1) Milepost and Stationing is approximate and has been provided as reference, it should be confirmed by Regional Consultant Teams.



### 3.1.3 TRACK

- A two-character reference designator shall be used for HST Tracks: an alpha character followed by a numeric.

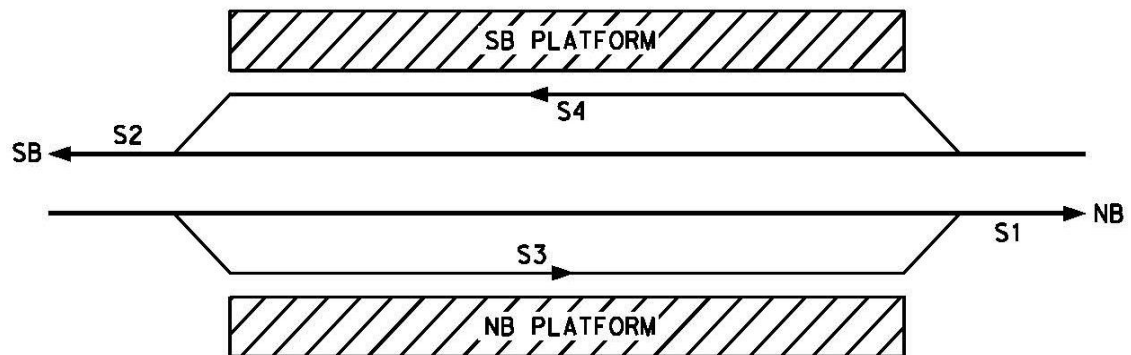
All tracks will use as prefix the single alpha character subdivision identifier.

In addition, HST tracks shall be designated as “1” for northbound and “2” for southbound.

Where there are more than two HST tracks the additional tracks are numbered on a site specific basis, using odd numbers for northbound and even numbers for southbound.

*Example:*

Sierra SB tracks **S2, S4**; Bay NB tracks **B1, B3**



**Figure 2 – Station Tracks**

- Terminal tracks shall be designated with a “T” followed by a two-digit number, and an assigned three-character [NAM] prefix for terminal designator: X-[NAM]-T-##.

*Example:*

San Francisco Terminal tracks **B-SAF-T-01, B-SAF-T-02**

- Yard tracks shall be designated with “Y” followed by a two-digit number, and an assigned three-character [NAM] prefix for Yard designator: X-[NAM]-Y-##.

*Example:*

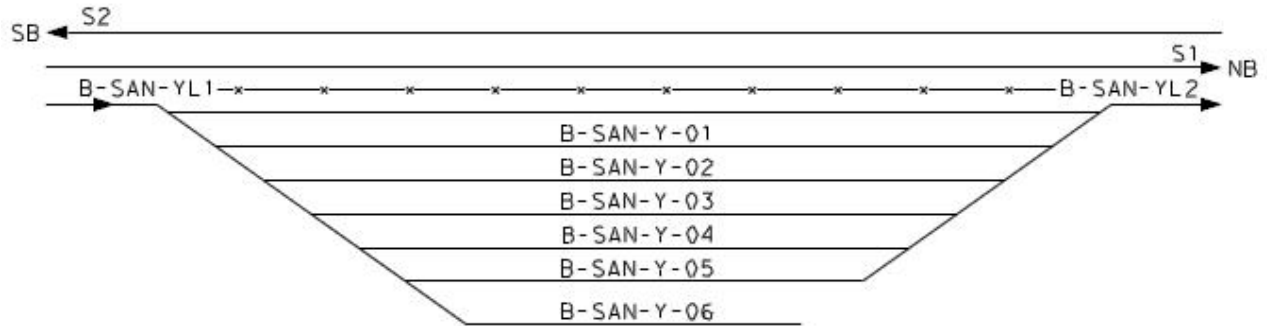
**C-MER-Y-01, C-MER-Y-02**



- Yard lead (Transition Tracks) tracks shall be designated with “YL” followed by a one-digit number, and an assigned three-character [NAM] prefix for Yard designator: followed by “1” for entering yard and “2” for exiting: X-[NAM]-YLn.

Example:

**C-MER-YL1, C-MER-YL2**



### 3.1.4 INTERLOCKING

- Identify intermediate interlocking using the convention X-INT-[NAM], where,

**X:** Subdivision name  
**INT:** Three-character element designator  
**[NAM]:** Three-character designator for nearest Street

Example:

Sierra Subdivision interlocking **S-INT-FLO**

- For Station interlocking, add a suffix to the above convention using the convention X-INT-[NAM]-**(S/N)** where,

**(S/N):** Denotes **S** South of Station or **N** North of Station

Example:

Sierra Subdivision station interlocking south of station **S-INT-FLO-S**

### 3.1.5 STATIONING

The southbound HST track centerline shall be the control line for stationing; begin at station 100+00, at milepost 0.0 in San Francisco increasing towards the south to Anaheim. Further, the Capitol, San Jacinto and Pacheco Subdivisions will increase north to south. In order to differentiate the stationing, the two-character track reference designator shall be added as a prefix for all subdivisions, **X###+##**.

Example:

Bay SB Track at CP Merced **B8000+00**

Pacheco SB Track CP Merced **P310+00**



### 3.1.6 ELEMENTS DESIGNATOR

The following facilities, equipment and devices shall be identified using the convention **X** as the prefix, followed by the element's designator:

<b>X:</b>	Subdivision name:
<b>B</b>	Bay
<b>C</b>	Capitol
<b>D</b>	Desert
<b>J</b>	San Jacinto
<b>P</b>	Pacheco
<b>S</b>	Sierra
<b>T</b>	Tongva

#### Survey Control Monuments

Identify Survey Control Monuments using the convention **X####P** where,

<b>X:</b>	Subdivision name:
<b>####:</b>	3-digit number (001-999)
<b>P:</b>	Denotes Primary Survey Control Monument Designation

*Example:*

Primary Survey Control Monument in Bay Subdivision **B204P**

#### Access Roadway

- Identify Access Roadways using the convention **X-[NAM]-(#)** where,

<b>X:</b>	Subdivision name
<b>[NAM]</b>	Three-character Access Road designator, street name of Access Road connecting to
<b>(#):</b>	1-digit number if multiple roadways with same street designator (1-9)

*Example:*

Sierra access road from Flore Street, **S-FLO**

Sierra fifth access road from Camino Real, **S-CAM-5**

- Temporary Roadways will use the same Access Roadways identifier but will have a "T" suffix. **X-[NAM]-(#)-(T)**.

*Example:*

Sierra Subdivision temporary access road from Second Street, **S-SEC-T**

Sierra Subdivision second Temporary access road from Third Avenue, **S-THI-2-T**





**Maintenance / Access Gates**

Identify Maintenance / Access Gates using the convention **X-MW[1/2]-[NAM]-(#)** where,

**X:** Subdivision name  
**MW:** Two-character element designator  
**[1/2]:** Denotes to which track gate is located along, 1 for NB and 2 for SB.  
**[NAM]** Three-character for Access Road designator  
**(#):** 1-digit number if multiple gates with same street designator (1-9)

*Example:*

**S-MW2-FLO**

**S-MW1-CAM-2**

**Stations**

Identify HST Stations using the convention **X-S-[NAM]** where,

**X:** Subdivision name  
**S:** One-character element designator  
**[NAM]** Three-character station designator assigned by PMT

<b>SAF</b>	San Francisco	<b>SBB</b>	San Fernando/Branford/Burbank
<b>SFO</b>	Millbrae-SFO	<b>LOS</b>	Los Angeles
<b>MPE</b>	Mid-Peninsula	<b>NSF</b>	Norwalk/ Santa Fe Springs or Fullerton
<b>SJD</b>	San Jose Diridon	<b>ANA</b>	Anaheim
<b>GIL</b>	Gilroy	<b>SGV</b>	San Gabriel Valley
<b>SAC</b>	Sacramento	<b>ONT</b>	Ontario Airport
<b>STO</b>	Stockton	<b>RIV</b>	Riverside
<b>MOD</b>	Downtown Modesto	<b>COR</b>	Corona
<b>MER</b>	Downtown Merced	<b>AFB</b>	March AFB
<b>FRE</b>	Fresno	<b>TEM</b>	Temecula/Murrieta
<b>KTR</b>	Kings/Tulare Regional	<b>ESC</b>	Escondido
<b>BAK</b>	Bakersfield	<b>SAD</b>	San Diego
<b>PAL</b>	Palmdale		

*Example:*

Sierra Fresno Station, **S-S-FRE**

Non HST Stations (through Stations) keep original name.

*Example:*

Caltrain Station, **Burlingame Station**



## Platforms

- Identify HST Stations Side Platforms using the convention **X-[NAM]-[1]/[2]** where,

<b>X:</b>	Subdivision name
<b>[NAM]</b>	Three-character station designator assigned by PMT
<b>[1]/[2]</b>	Denotes to which track platform is located along, 1 for NB and 2 for SB

*Example:*

Sierra Subdivision Fresno Station southbound side platform, **S-FRE-1**

- Identify HST Stations Center and Terminal Platforms using the convention **X-[NAM]-##** where,

<b>X:</b>	Subdivision name
<b>[NAM]</b>	Three-character station designator assigned by PMT
<b>##</b>	Denotes numbers of platforms (01-99)

*Example:*

Station along Sierra Subdivision with Center platform at **S-FRE**

Terminal Platforms at Transbay **B-TRA-04**

## Grade Separated Structures

Identify grade separated structures using the convention **X-{EL}-mp** where,

<b>X:</b>	Subdivision name
<b>{EL}:</b>	Two-character element designator
	<b>UP</b> Underpass
	<b>OP</b> Overpass
	<b>AS</b> Aerial Structure
	<b>BR</b> Bridge
	<b>SP</b> Separation
<b>mp:</b>	Denotes milepost <b>##.#</b> , identify northern milepost

For multi or split structures, add a suffix to the above convention **X-{EL}-mp-[1]/[2]** where,

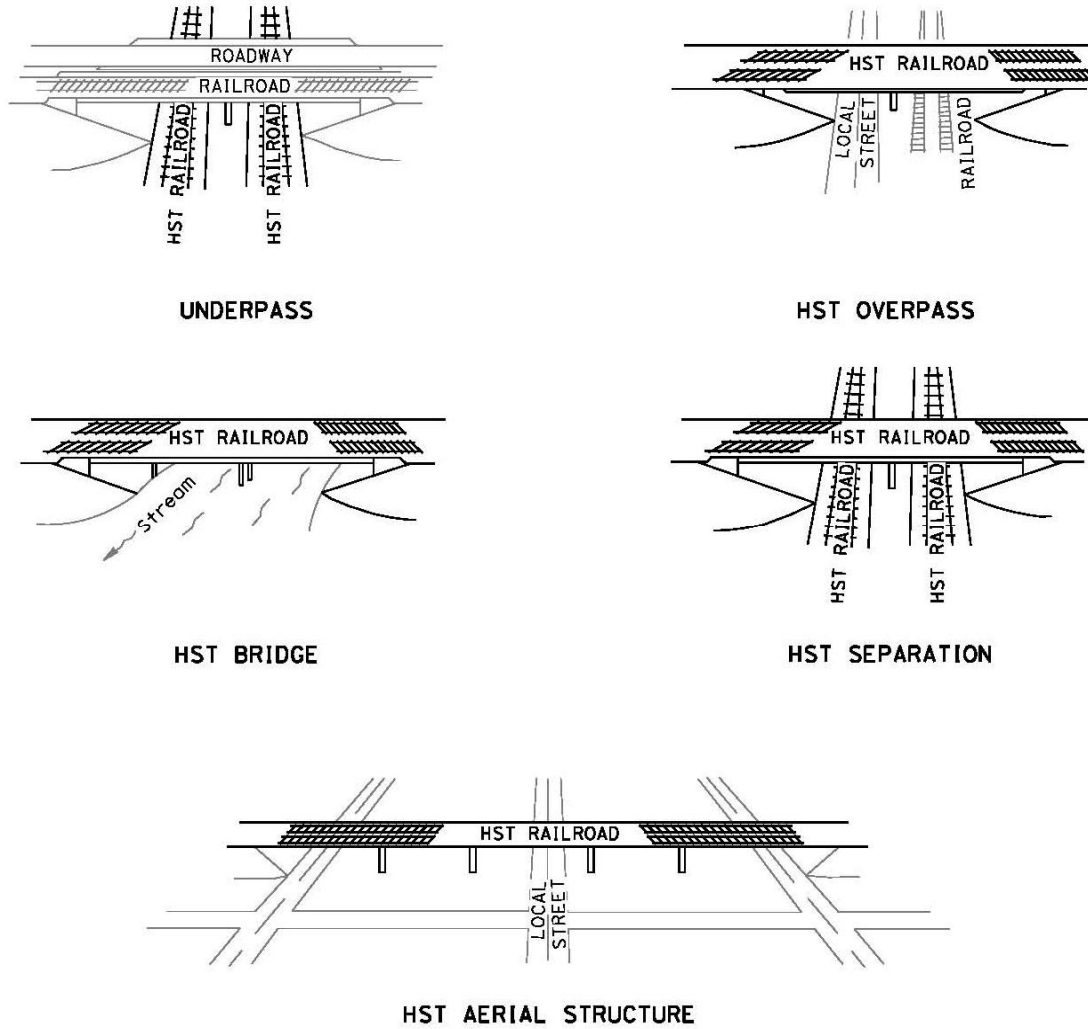
<b>[1]/[2]:</b>	Denotes 1 for NB and 2 for SB, HST Structure
-----------------	--

For identifying HST Structure piers and bents, add a two-digit suffix to the above convention **X-{EL}-mp-##** or **X-{EL}-mp-[1]/[2]-##** where,

<b>##</b>	Denotes numbers of bents and piers, from north to south (01-99)
-----------	---

Note: A Grade Separated Structure may also have a BIN name given by the owner of the structure.





FOR ROADWAY STRUCTURES NOMENCLATURE  
REFER TO STRUCTURE TYPES DEFINED  
IN THE CALTRANS HIGHWAY DESIGN MANUAL

**Figure 4 – Grade Separated Structure Types**

*Example:*

Grade separated structures on Sierra Subdivision.

Underpass:	<b>S-UP-170.2</b>	HST Bridge:	<b>S-BR-172.5</b>
HST Overpass:	<b>S-OP-175.5</b>	HST Separation:	<b>S-SP-176.8</b>
HST Aerial Structure:	<b>S-AS-180.5</b>	Piers/bents:	<b>S-AS-187.5-05</b>
HST Aerial Structure(multi):	<b>S-AS-188.4-1</b>	Piers/bents (multi):	<b>S-AS-187.5-1-0</b>



## Tunnels / Underground Structures

- Identify tunnel using the convention **X-TS[1]/[2]-mp-(n)** where,
 

<b>X:</b>	Subdivision name
<b>TS:</b>	Two-character element designator
<b>[1]/[2]:</b>	Denotes 1 for NB and 2 for SB, only use if single track tunnel track.
<b>mp:</b>	Denotes milepost ##.#, identify northern milepost
<b>(n):</b>	Denotes multi sequential tunnels (1-9)

*Example:*

Bay subdivision northbound single track tunnel, **B-TS1-66.5**

Bay subdivision two track sequential tunnel number 3, **B-TS-77.5-3**

- For tunnel infrastructure elements, add a suffix to the above convention using the convention **X-TS[1]/[2]-mp-(n)-{EL}** where,
 

<b>{EL}</b>	One-character denotes:
<b>P(S/N)</b>	Portal
	<b>(S/N):</b> Denotes <b>S</b> South Portal or <b>N</b> North Portal
<b>V#</b>	Ventilation Structures
	<b>#</b> Denotes quantity, increases in direction of stationing (1-9)
<b>C#</b>	Cross passages
	<b>#</b> Denotes quantity, increases in direction of stationing (1-9)

*Example:*

Bay subdivision northbound single track tunnel - **B-TS1-66.5**

North Portal - **B-TS1-66.5-PN**

1<sup>st</sup> Ventilation Structures - **B-TS1-66.9-V1**

2<sup>nd</sup> Cross Passages - **B-TS1-67.2-C2**

## Buildings

- Operation Control Centers
 

Identify Operation Control Centers using the convention **X-OCC-#** where,

<b>X:</b>	Subdivision name
<b>OCC:</b>	Three-character element designator
<b>#</b>	Denotes quantity, increases in direction of stationing (1-9)

*Example:*

Capital subdivision 2<sup>nd</sup> Operational Control Center **C-OCC-1**



**Walls**

Identify walls using the convention **X-{EL}[1]/[2]-mp** where,

<b>X:</b>	Subdivision name
<b>{EL}:</b>	Two-character element designator
	<b>RW</b> Retaining Wall
	<b>SW</b> Sound Wall
	<b>WW</b> Wind Wall
	<b>IP</b> Intrusion Protection Wall
<b>[1]/[2]:</b>	Denotes 1 for NB and 2 for SB
<b>mp:</b>	Denotes milepost ##.#, identify northern milepost

*Example:*

Walls located along Sierra Subdivision NB HST Track:

Retaining Wall **S-RW1-188.4**

Sound Wall **S-SW1-172.5**

Wind Wall **S-WW1-280.4**

Intrusion Protection Wall **S-IP1-300.7**

**Traction Power**

Identify Traction Power facilities according to the convention **X-{TYPE}-[NAM]** where,

<b>X:</b>	Subdivision name
<b>{TYPE}:</b>	Element designator
	<b>SS</b> Substations
	<b>PS</b> Paralleling Stations
	<b>SWS</b> Switching Stations
	<b>PB</b> Phase Break
<b>[NAM]:</b>	Three-character designator for nearest Street

*Example:*

**S-SS-FLO**



### **Power Utility Company / HV Electrical Power Connections**

- Identify Utility Switching Stations according to the convention **X-{TYPE}-[NAM]-USW** where,

**X:** Subdivision name  
**{TYPE}:** Element designator for Type of Traction Power Facility,  
           **SS** Substations  
           **PS** Paralleling Stations  
           **SWS** Switching Stations  
**[NAM]:** Three-character designator for nearest Street  
**USW:** Three-character element designator

- For HV Connection - tie, add a suffix to the above convention using the convention **X-{TYPE}-[NAM]-USW-HV[kV###]** where,

**HV[kV###]:** Character element designator  
               **###** Voltage designation (115, 220, 230 kV)

*Example:*

**S-SS-FLO-USW** and **S-SS-FLO-USW-HV115**

### **Train Control**

- Interlocking Houses

Identify Interlocking facilities according to the convention **X-INT-[NAM]-#** and **X-INT-[NAM]-*(S/N)*-#** where,

**X:** Subdivision name  
**INT:** Three-character element designator  
**[NAM]:** Three-character designator for nearest Street  
**(S/N):** Denotes **S** South of Station or **N** North of Station  
**H#:** Denotes quantity of interlocking houses, increases in direction of stationing (1-9)

*Example:*

Intermediate Interlocking **S-INT-FLO-H1**

Interlocking North of Station **S-INT-FLO-N-H1**



## Communications

- Communications Equipment or shelters co-located with Traction Power Facilities and Train Control Interlocking Houses

Identify Communication Equipment at Traction Power Facilities according to the convention **X-{TYPE}-[NAM]-RT** where,

<b>X:</b>	Subdivision name
<b>{TYPE}:</b>	Element designator
	<b>SS</b> Substations
	<b>PS</b> Paralleling Stations
	<b>SWS</b> Switching Stations
	<b>INT</b> Interlocking Houses
<b>[NAM]:</b>	Three-character designator for nearest Street
<b>RT:</b>	Two-character element designator

*Example:*

**S-SS-FLO-RT**

- Standalone Radio Sites

Identify Standalone Radio Sites Equipment according to the convention **X-ST-[NAM]-RT** where,

<b>X:</b>	Subdivision name
<b>ST:</b>	Standalone Tower
<b>[NAM]:</b>	Three-character designator for nearest Street
<b>RT:</b>	Two-character element designator

*Example:*

**S-ST-FLO-RT**

## Maintenance Facility

Identify Maintenance Facility using the convention **X-{Type}-[NAM]** where,

<b>X:</b>	Subdivision name
<b>{Type}:</b>	Three-character designator for type of facility
<b>MOE</b>	Maintenance of Equipment
<b>MOI</b>	Maintenance of Infrastructure
<b>[NAM]:</b>	Three-character Maintenance Facility designator assigned by PMT

*Example:*

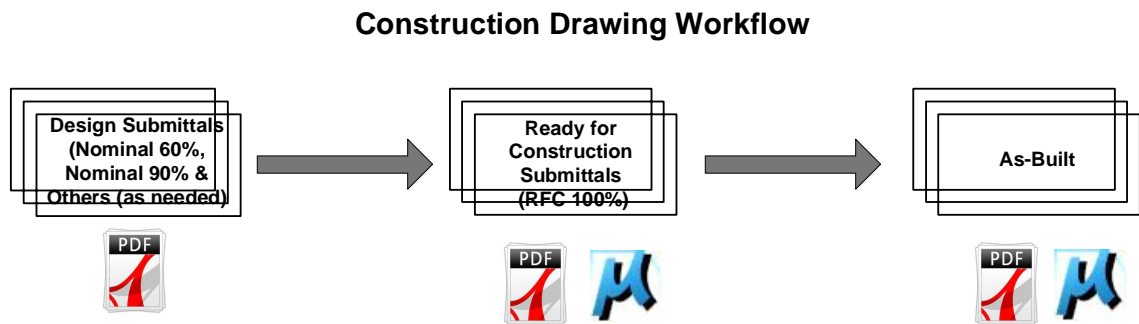
Bay segment Maintenance of Equipment Facility **B-MOE-GEN**



## 4.0 CONSTRUCTION DRAWINGS

### 4.1 CONSTRUCTION DRAWING SUBMITTALS

Construction drawings furnished by the contractor represent the post-preliminary design project delivery, from proposed design through completion of construction. Construction drawings submittals can be categorized into three (3) types – Design Submittal drawings, Ready for Construction (RFC) and As-Built drawings. The below graphic indicates the construction drawing workflow:



#### 4.1.1 CONSTRUCTION DRAWING SUBMITTAL REQUIREMENTS

The CHSTP management team has established SharePoint and ProjectWise as its primary electronic document managements system for construction drawings submittals. All drawings submitted to the Authority shall be in the following formats:

- Design Submittals (Nominal 60%, Nominal 90% and Others): PDF
- Ready for Construction (RFC) Drawings: PDF and DGN
- As-Built: PDF and DGN

For hard copy and electronic “soft” copy deliverables requirements, see Section 1.3.6 and 1.3.7 of the CHSTP CADD Manual.

#### 4.1.2 SIGN AND SEAL REQUIREMENTS

Ready for Construction (RFC) drawings shall be signed and sealed by a licensed California professional engineer. Sign and seal information shall be placed in the stamp area of the titleblock, as indicated by Section 2.4.3 of this Manual.





## 4.2 AS-BUILT DRAWINGS

As-Built drawings are the original RFC drawings that have been updated showing changes that occurred during the course of construction. As-built drawings are mandatory for accurately recording the final field conditions at the completion of the contract.

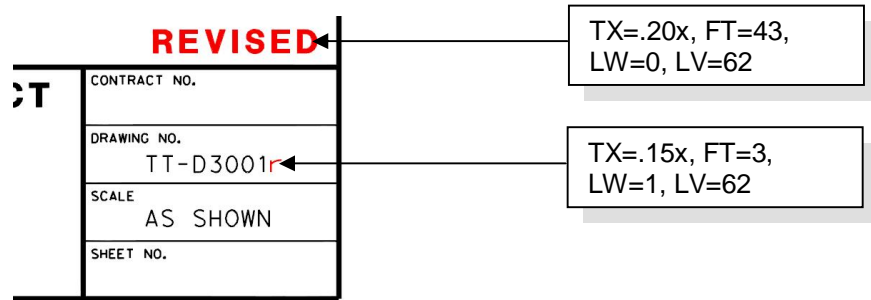
### 4.2.1 AS-BUILT DRAWING PROCEDURES

Any changes made during design in the form of contract change orders and/or field changes according to his/her redlined field corrections shall be conformed into one record as-built drawing. Revisions shall be made directly on the Ready for Construction (RFC) drawings in DGN format. When completing the As-Built drawings, the following procedures shall be followed to incorporate corrections:

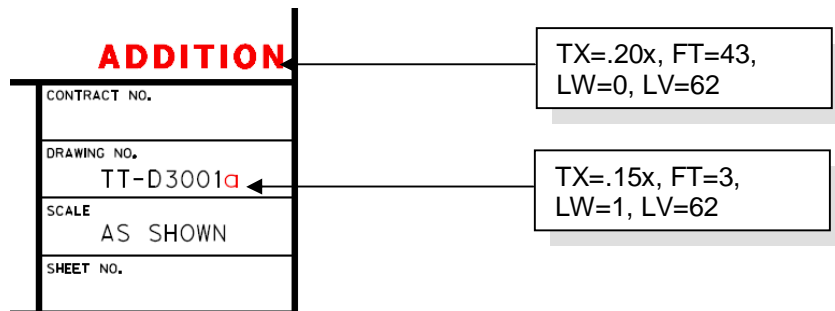
- As-Built corrections shall be on Level 62 AsBuilt Chng
- Each As-built drawing must be clearly identified with an As-built stamp, as defined in Section 4.2.2 of this Manual.
- Superseded information must remain legible and shall not be deleted. Instead, denote changes by striking through the original information.  
Strikethrough linework: LW=1, LV=62
- To differentiate the correction information from the contents shown on the RFC drawings, text shall be larger than the original information and show in *italics*.  
Correction text: TX=.175x, FT=3, LW=1, LV=62, *Italics*
- If any item(s) of work that was part of the RFC drawings is not constructed, the item(s) must be crossed out and stated that it was not constructed  
Correction text : TX=.175x, FT=3, LW=1, LV=62, *Italics*
- Any design change initiated by the contract change order must be indicated on the As-Built drawings.



- Best practice is to show all as-built changes on the original RFC drawings. If the as-built changes cannot be clearly indicated on the RFC drawing, then a revised drawing may be necessary in order to indicate the changes. A revised drawing is an additional drawing with no new or additional work added. They may include the entire RFC drawing or a portion of the sheet in greater detail for clarity purposes. The signature and seal information of the original RFC drawings shall remain since no new work is was added. Use revised drawings only when absolutely necessary. Drawings must be labeled “REVISED” and a lower case “r” added to the drawings number, as shown below.



If new or additional work is designed and constructed, additional drawings need to be included in the as-built drawings. An additional drawing only indicates new or additional work, not revisions. . All additional drawings generated during construction shall update the signature and seal information to the resident engineer in charge who initiated the new and additional drawings. Additional drawings must be labeled “ADDITION” and a lower case “a” are added to the drawings number, as shown below.



### 4.2.2 AS-BUILT STAMPS

Two different cells from the CHSTP cell library shall be used for developing as-built drawings. Each as-built drawing must have one of the two stamps, including revised drawings and additional drawings.

Cell = Asblt1

Use: As-built drawings with no corrections

<b>AS BUILT</b>
(NO CORRECTIONS ON THIS SHEET)
CONTRACT No. _____
C.C.A. DATE _____
R.E. NAME _____

Cell = Asblt2

Use: As-built drawings with corrections

<b>AS BUILT</b>
CONTRACT No. _____
C.C.A. DATE _____
R.E. NAME _____

### 4.3 THIRD PARTY DRAWINGS

All Caltrans and third party submittals shall be submitted in accordance of the local agency/company CADD requirements and submittal process. In addition to the local agency/company submittal requirements, PDFs shall be submitted to the Authority for all third party submittals.



## APPENDIX A – FACILITY NAMING CONVENTION SUMMARY TABLE

PROJECT NOMENCLATURE / FACILITY NAMING	CODE	EXAMPLE
<b>INFRASTRUCTURE ELEMENTS</b>		
1. Survey and Mapping		
Survey Markers	<b>X####(P)</b>	B204P
2. Right-of-Way		
Maintenance / Access Gates	<b>X-MW[1/2]-[NAM](-#)</b>	S-MW2-FLO-2
3. Track Alignment		
Tracks		
- Mainline Tracks	<b>Xn</b>	S1
- Station Tracks	<b>Xn (not 1 or 2)</b>	S5
- Terminal Tracks	<b>X-[NAM]-T-##</b>	B-SAF-T-01
- Yard Track	<b>X-[NAM]-Y-##</b>	S-FRE-Y-01
- Yard Track Lead	<b>X-[NAM]-YLn</b>	S-FRE-YL1
- Interlocking		
Interlocking at Stations	<b>X-INT-[NAM]-(S/N)</b>	S-INT-FLO-S
Interlocking Intermediate	<b>X-INT-[NAM]</b>	S-INT-FLO
4. Roadway Works		
Access Roadways	<b>X-[NAM](-#)</b>	S-FLO
5. Temporary Construction Facilities		
Temporary Access Roads	<b>X-[NAM](-#)-T</b>	S-FLO-T
6. Stations		
HST Stations	<b>X-S-[NAM]</b>	S-S-FRE
Non HST Stations (through Stations)	<b>Use current station name</b>	Burlingame Station
Platform		
- Platforms Side	<b>X-[NAM]-[1]/[2]</b>	S-FRE-1
- Platforms Center	<b>X-[NAM]</b>	S-FRE
- Terminal Platform	<b>X-[NAM]-##</b>	B-TRA-04
7. Grade Separation Structures		
Underpass	<b>X-UP-mp</b>	S-UP-170.2
HST Overpass	<b>X-OP-mp</b>	S-OP-175.5
HST Aerial Structure	<b>X-AS-mp</b>	S-AS-180.5
HST Aerial Structure (Two Structures)	<b>X-AS-mp-[1]/[2]</b>	S-AS-188.4-1
HST Bridge	<b>X-BR-mp</b>	S-BR-172.5
HST Separation	<b>X-SP-mp</b>	S-SP-176.8
- Piers / Bents	<b>X-{EL}-##</b>	S-AS-187.5-05



- Piers / Bents (Two-Structures)	<b>X-{EL}-mp-[1]/[2]-##</b>	S-AS-187.5-1-05
8. Tunnels / Underground Structures		
Tunnels	<b>X-TS[1]/[2]-mp-(n)</b>	B-TS2-77.5-3
- Portals	<b>X-TS[1]/[2]-mp-(n)-P(NS)</b>	B-TS1-66.5-3-PN
- Ventilation Structures	<b>X-TS[1]/[2]-mp-(n)-V#</b>	B-TS1-66.9-3-V1
- Cross Passages	<b>X-TS-mp-(n)-C#</b>	B-TS-67.2-3-C1
9. Buildings		
Operation Control Centers	<b>X-OCC-#</b>	C-OCC-1
10. Earthwork, Retaining Structures and Borrows Sites		
Retaining Walls	<b>X-RW[1]/[2]-mp</b>	S-RW1-188.4
Sound Wall	<b>X-SW[1]/[2]-mp</b>	S-SW1-172.5
Wind Wall	<b>X-WW[1]/[2]-mp</b>	S-WW1-280.6
Intrusion Protection Wall	<b>X-IP[1]/[2]-mp</b>	S-IP1-300.7
11. Hydrology/Hydraulics, Drainage/Grading	<i>TBD</i>	<i>TBD</i>
12. Utilities	<i>TBD</i>	<i>TBD</i>
13. Geotechnical	<i>TBD</i>	<i>TBD</i>
14. Seismic	<i>TBD</i>	<i>TBD</i>
15. Contaminated Soil/Groundwater	<i>TBD</i>	<i>TBD</i>
16. Other	<i>TBD</i>	<i>TBD</i>
<b>SYSTEMS ELEMENTS</b>		
1. Traction Power		
Substations	<b>X-SS-[NAM]</b>	S-SS-FLO
Paralleling Stations	<b>X-PS-[NAM]</b>	S-PS-FLO
Switching Stations	<b>X-SWS-[NAM]</b>	S-SWS-FLO
Phase Break	<b>X-PB-SS-[NAM] or X-PB-SWS-[NAM]</b>	S-PB-SWS-FLO
2. Power Utility Company / HV Electric Power Connections		
Utility Switching Stations	<b>X-SS-[NAM]-USW</b>	S-SS-FLO-USW
HV Connection	<b>X-SS-[NAM]-USW-HV[kV###]</b>	S-SS-FLO-USW-HV115
3. Overhead Contact System (OCS)		
4. Train Control		
Interlocking Houses (Intermediate)	<b>X-INT-[NAM]-H#</b>	S-INT-FLO-H1
Interlocking Houses (Stations)	<b>X-INT-[NAM]-(S/N)-H#</b>	S-INT-FLO-N-H1
5. Communications		
Traction Power Facility and Train Control Interlocking Houses	<b>X-{TYPE}-[NAM]-RT X-SS-[NAM]-RT X-PS-[NAM]-RT X-SWS-[NAM]-RT X-INT-[NAM]-RT</b>	S-SS-FLO-RT



Standalone Radio Tower Site	<b>X-ST-[NAM]-RT</b>	S-ST-FLO-RT
<b>MAINTENANCE ELEMENTS</b>		
1. Maintenance of Equipment		
Facility	<b>X-MOE-[NAM]</b>	B-MOE-GEN
2. Maintenance of Infrastructure		
Facility	<b>X-MOI-[NAM]</b>	S-MOI-GEN



## **APPENDIX B –PRELIMINARY ENGINEERING FOR PROCUREMENT DRAWING SAMPLE PLAN CHECKLISTS**

The sample plan checklists are intended for use in the preparation of the contract drawings .



## TITLE SHEET

### General

- Titlesheet shall always include “Proposed Preliminary Design” & “California High Speed Train Project” title text. Subdivision and segment and/or contract titles shall be revised as needed
- Project / Subdivision title TX=0.45x, FT=43, LW=0, LV=1060
- Contract title TX=0.35x, FT=43, LW=0, LV=1060
- Seal information required from Engineering Manager. (1) seal per segment
- Design Firm/JV logos shall be shown in the lower left corner

### California High Speed Train Project Map

- California High-Speed Train Project Map shall be located at the top right corner of the sheet.
- Alignment shown for the entire CHSTP project. Hatch Project Location area to indicate limit of work
- Limit of Work Hatch LV=1060, Angle=45d, Scale of 0.05x
- CHSTP Project Map Alignment (within limit of work) LW=7, LV=1019
- CHSTP Project Map Alignment (within limit of work) LW=3, LV=1019

### Project Location Map

- Project location map required indicating the limits of work for the CHSTP alignment.
- Project location shall include, but not limited to, the following information
  - Alignment (no station labels)
  - Begin and End work stations & labels
  - County Boundary linework and labels
  - City Names
  - Major Roads/Road Names
  - Label with arrow for nearest HST station
  - Important adjacent railroad / infrastructure features
  - Major water features
- HST Alignment within work limit LW=10, LV=1018
- HST Alignment outside work limit LW=3, LV=1019
- City Name TX=0.175x, FT=3, LW=3, LV=1060
- Road Names/Callouts TX=0.14x, FT=3, LW=1, LV=1060
- County Names TX=0.24x, FT=43, LW=0, LV=1060, Italics
- BEGIN/END work labels TX=0.175, FT=3, LW=2, LV=1060





## INDEX OF DRAWINGS

- Index Volume title shall be TX=0.24x, FT=43, LW=0, LV=1060
- Index table information shall be TX=0.14x, FT=3, LW=1, LV=1060
- Exterior Border lines shall be LV=1060, LW=2
- Interior vertical column lines and column heading line shall be LV=1060, LW=1
- Interior horizontal row lines shall be LV=1060, LW=0
- Column titles shall be Drawing No., Rev No. and Drawing Description
- All drawing titles shall be listed in the Drawing Description column. A dash between text represents a new line in the titleblock.
- Gaps in pagination shall be indicated as "(NOT USED)" as shown below

		68 700+00 TO 68 710+00
RP034	A	ROADWAY CONSTRUCTION PLAN 68 710+00 TO 68 720+00
RP035 - RP038		(NOT USED)
RP039	A	ROADWAY CONSTRUCTION PLAN ALA MIKE STREET 68 720+00 TO 68 730+00



## SURVEY CONTROL DATA PLAN

- Notes shall be located at the top right corner of the sheet.
- Road names and Callouts shall be TX=0.14x, FT=3, LW=1, LV=1060
- Survey Data points shall be TX=0.175x, FT=3, LW=1, LV=1015
- Leaders and Dimensions shall be TX=0.14x, FT=3, LV=1012
- Existing topographic image
- North arrow
- Show Survey data control points with symbol (AC=PRHV)
- Horizontal and Vertical Control information organized into a table. Columns shall include Point #, Description, Northing, Easting and Elevation
- List Horizontal Control Datum, vertical control datum and projection information
- AC=MATCH LINE for Match line text and symbology
- Station HST alignment every 1000' (S2 only unless tracks are non-concentric) TX=0.14x, LV=1019, LW=1
- HST alignment: LV=1020, LW=3



## TRACK GUIDEWAY AND ROADWAY TYPICAL SECTIONS

### General

- Notes shall be located at the top right corner of the sheet.
- Section, Plan, Profile and Detail title shall be TX=0.24x, FT=43, LW=0, LV=1015 for Track Plans, LV=10 for Roadway Plans
- Notes title shall be TX=0.175x, FT=3, LW=1, LV=1015 for Track Plans, LV=60 for Roadway Plans
- Leaders and Dimensions shall be TX=0.14x, FT=3, LV=1012 for Track Plans, LV=60 for Roadway Plans
- Notes and callouts shall be TX=0.14x, FT=3, LW=1, LV=1014 for Track Plans, LV=60 for Roadway Plans
- AC=MATCH LINE for Match line text and symbology
- AC=GR-SCALE for scale bar (full size scale)
- Label Track Right of Way and Temporary Construction easement as "PROP ROW" and "PROP TCE" respectively at each matchline.
- Increasing stationing of the typical sections from top to bottom of sheet.

### Track Typical Sections

- Typical cross sections identifying
  - station to station geometrics
  - track type and depth
  - cut/fill and cross slopes
- Show appropriate vertical clearances from Top of Rail or Top of Low Rail and horizontal clearances from track centerline to structures.
- 

- OCS components shown in gray scale (Color 140)
- Label Alignment Control Point (CP) and Top of Rail (TOR)
- Intrusion Protection
- Cable Trough
- Drainage features

### Roadway Typical Sections

- Typical cross sections identifying
  - station to station roadway geometrics
  - surfacing type and depth
  - cut/fill and cross slopes
  - guardrail, curb type, barrier type
  - vertical cut locations
- No rolling stock shown

### Structural and Tunnel Typical Sections

- Bridge superstructure cross-sections (including structure depth and construction type)
- Tunnel cross sections including considerations for train operations, fire and life safety requirements, OCS, and fixed equipment
- No rolling stock shown



**KEY MAPS (TRACK GUIDEWAY,  
TRACK STRUCTURES & UTILITIES)**

- Notes shall be located at the top right corner of the sheet.
- Notes title shall be TX=0.175x, FT=3, LW=2, LV=1015
- Leaders and Dimensions shall be TX=0.14x, FT=3, LV=60 for Roadway Plans, LV=1012 for Track Plans
- Station and street labels shall be TX=0.14x, FT=3, LW=1, LV=60 for Roadway Plans, LV=1014 for Track Plans. Station @ each end of sheet match line.
- City/Town names & Drawing No. shall be TX=0.175x, FT=3, LW=2, LV=60 for Roadway Plans, LV=1015 for Track Plans
- Scale varies
- Topographic background (no aerial) for 30% design drawings, Aerial background for 15% design drawings



## TRACK GUIDEWAY HORIZONTAL ALIGNMENT DATA TABLE

- Table Headings shall be TX=0.175x,  
FT=3, LW=2, LV=1060
- Text with tables shall be TX=0.14x,  
FT=3, LV=1060
- Exterior Border lines – LV=1060, LW=2
- Interior vertical column lines and  
column heading line: LV=1060, LW=1
- Interior horizontal row lines: LV=1060,  
LW=0
- Geometric data to two decimal places
- Design speed to one decimal place
- Actual and unbalanced superelevation  
data to the nearest ¼ inch



## TRACK GUIDEWAY PLAN AND PROFILE

- Notes shall be located at the top right corner of the sheet.
- Plan & Profile titles shall be TX=0.24x, FT=43, LW=0, LV=1015
- Notes title shall be TX=0.175x, FT=3, LW=1, LV=1015
- Leaders and Dimensions shall be TX=0.14x, FT=3, LV=1012
- Notes and callouts shall be TX=0.14x, FT=3, LW=1, LV=1014
- Dimensions shall be in decimal feet (##.##)
- Existing topographic background showing existing conditions
- North arrow
- Vertical Alignment showing key existing features (ground, water bodies, high-risk utility crossing, and over and under crossings)
- AC=MATCH LINE for Match line text and symbology
- AC=GR-SCALE for scale bar (full size scale)
- Critical Clearances shall be confirmed and noted on plan and profile views
- Delineate environmentally sensitive areas (ESA) and other areas that have restricted access
- Label HST tracks (S1, S2, et al) and other parallel and /or transverse highways and railroads
- Right-of-Way limits including temporary easements. Label Track Right of Way as "PROP ROW". Label Temporary Construction easement as "PROP TCE" at each Matchline.
- ROW note as note #1.
- No toe and top of slope line work or callouts shall be shown
- Fencing, Noise mitigation and/or Retaining features shall be shown
- Show outline in profile view for grade separation structures
- Show station equations for intersecting alignments
- Show curve, spiral as a table on a separate sheet. Show curve number with radius on plan view only.
- Label tangent bearings and distance on alignment



## TRACK STRUCTURES TYPICAL SECTION

- Total width of structure
- Spacing between track centerline and OCS pole centerline
- Spacing between track centerlines
- OCS configuration Color =140
- Indicate and show top of rail
- Callout walkway and cable trough
- Cross slope of the deck
- Location of control point (CP)
- Structure depth/type
- Substructure:
  - Pier /column diameter
  - Foundation - pile cap (Length, Width, Thickness)
  - Drill shaft (Number, Diameter, Length)
  - Minimum horizontal clearance from face of HST column to critical elements.
- Approximate original ground (OG)
- Required Vertical and Horizontal clearances, if any, to adjacent or crossing facilities (RR, HWY, et al)



**TRACK STRUCTURAL PLAN****(Sheet 1 of 2)****GENERAL:**

- Notes shall be located at the top right corner of the sheet.
- Plan, Profile and Top Of Rail titles shall be TX=0.24x, FT=43, LW=0, LV=1015
- Notes title is TX=0.175x, FT=3, LW=1, LV=1015
- Leaders and Dimensions shall be TX=0.14x, FT=3, LV=1012
- Notes and callouts shall be TX=0.14x, FT=3, LV=1014
- Dimensions shall be in feet and inches (##'-##")
- Label HST tracks (S1, S2, et al) and other parallel and /or transverse highways and railroads
- AC=MATCH LINE for Match line text and symbology
- AC=GR-SCALE for scale bar (full size scale)
- Right-of-Way limits including temporary easements. Label Track Right of Way as "PROP ROW". Label Temporary Construction easement as "PROP TCE".
- Transition structure locations and Type (i.e., at-grade to bridge, bridge to tunnel, et al)
- Table of retaining wall limits (extent and height) of walls and foundations. Shown on structural layout plans
- Indicate requirements for existing facility modifications (pedestrian, roadway, highway, and railroad)

**PLAN:**

- Existing topographic background showing existing conditions
- Right-of Way limits including temporary easements. Label Track Right of Way as "PROP ROW". Label Temporary Construction easement as "PROP TCE".
- North Arrow and Name and direction of nearest towns and/or cities
- Name and direction of stream flow or roadway under the structure
- Total width of structure
- Control line intersection stations, as applicable
- Station intervals for scale <50 scale
- Location of minimum vertical clearance
- Label HST tracks (S1, S2, et al) and other parallel and /or transverse highways and railroads
- Slope paving at abutment, as applicable
- Horizontal clearance from pier centerline to existing and proposed elements
- Show HST alignment points (TS, SC, CS, et al), as applicable
- Show major existing utilities (overhead and underground) and utility relocations as applicable
- Existing facility modifications plan (pedestrian, roadway, highway, railroad), major utility relocations
- Tangent and curve callouts
- Skew angel (between the normal or radial to centerline of structures and CL of pier or abutment), as applicable





## TRACK STRUCTURAL PLAN

### (Sheet 2 of 2)

- Datum (NGVD 88) elevations
- Span layout, for complex and non-standard structures.
  - Length / Width / Depth
  - Maximum height
  - Expansion joint locations  
[Aerial/Overpass/Underpass/  
Separation Structures]

### **ELEVATION:**

- Total length of structure along the control line (begin to end)
- Minimum vertical clearance(s)
- Datum (NGVD 88) line with elevation and stations
- Approximate original ground (OG) line
- Estimated 100-year flood elevation, as applicable
- Span length(s) from begin/end of structure to pier centerline and between each pier centerlines (Aerial)
- Locations of expansion joints  
[Aerial/Overpass/Underpass/  
Separation Structures]
- Station and Elevation (top of rail) at first & last pier on each sheet  
[Aerial/Overpass/Underpass/  
Separation Structures]. Station and Elevation (top of rail) at Match lines of each sheet [Trench]. Add callouts at crest/sag pts
- Abutment and bent numbers  
[Aerial/Overpass/Underpass/  
Separation Structures]
- Struts and spacing of struts, as applicable [Trench]



## TRACK STRUCTURES / ROADWAY DRAFT GENERAL PLAN

(Sheet 1 of 2)

### GENERAL:

- Notes shall be located at the top right corner of the sheet.
- Plan, Profile and Top Of Rail titles shall be TX=0.24x, FT=43, LW=0, LV=315
- Notes title is TX=0.175x, FT=3, LW=2, LV=315
- Leaders and Dimensions shall be TX=0.14x, FT=3, LV=312
- Notes and callouts shall be TX=0.14x, LW=1, FT=3, LV=314
- Dimensions shall be in feet and inches (XX'-XX")
- Label HST track (S2) and other parallel and /or transverse highways and railroads
- AC=MATCH LINE for Match line text and symbology
- AC=GR-SCALE for scale bar (full size scale)
- Right-of Way limits. Label Track Right of Way as "PROP ROW".
- Easements associated with structure
- Transition structure locations and Type (i.e., at-grade to bridge)
- Table of retaining wall limits (extent and height) of walls and foundations
- Indicate requirements for existing facility modifications (pedestrian, roadway, highway, and railroad)

### TYPICAL SECTION:

- Total width of structure
- Show widths of traveled way, sidewalks, shoulder and medians [Roadway]
- Cross slope of the deck
- Location of profile grade (PG)
- Show width of barrier rail and type only [Roadway]
- Structure depth/type
- Show utilities and openings for future utilities
- Approximate original ground (OG)
- Substructure dimensions [Aerial/Overpass/Underpass/ Separation Structures]
  - pier/footing locations
  - spread footings and/or drilled pier
  - column type
  - approximate size
  - identify areas where supports or foundations are prohibited



## TRACK GUIDEWAY / ROADWAY STRUCTURAL DRAFT GENERAL PLAN

(Sheet 2 of 2)

### PLAN:

- Existing topographic background showing existing conditions
- North arrow
- HST control line and alignment name
- Total width of structure
- Control line intersection stations
- 100' Station intervals for scale <50 scale
- Location of minimum vertical clearance
- Show begin and end station of structure
- Label HST track (S2) and other parallel and /or transverse highways and railroads
- Right-of Way limits. Label Track Right of Way as "PROP ROW".
- Slope of cut or fill (2:1, 4:1, et al), as applicable
- Top and toe of approach fill or cut, as applicable
- Bank protection or slope paving, as applicable
- Horizontal clearance from face of pier to HST track centerline and other critical elements
- Show major existing utilities (overhead and underground)
- Show proposed Systems sites
- Approach slab, as applicable
- Stream flow and/or traffic arrows, as applicable
- Guard rail, temporary railings, and approach rail curb

### ELEVATION:

- Abutment and bent numbers
- Total length of structure along the control line (begin to end)
- Span length(s) from begin/end of structure to pier centerline and between each pier centerlines
- Minimum vertical clearance(s)
- Datum (NGVD 88) line with elevation and stations
- Approximate original ground (OG) line
- Locations of expansion joints, as applicable
- Pier/footing locations
- Struts and spacing of struts, as applicable



## ROADWAY INDEX MAP

- Notes shall be located at the top right corner of the sheet.
- Notes title shall be TX=0.175x, FT=3, LW=2, LV=1015
- Leaders and Dimensions shall be TX=0.14x, FT=3, LV=60
- Notes and callouts shall be TX=0.14x, FT=3, LW=1 LV=60
- Map Titles, Column Headings and City names shall be TX=0.24x, FT=43, LW=0, LV=60
- Scale varies
- Provide table for Grade Separation Location, Sheet Title, Roadway Drawing number(s) and Structural Drawing number(s), as applicable
- Use symbol to denote location
- Differentiate between grade separation, local road modification and State Facility modifications
- Grade Separation: AC=KMGS
- Caltrans Facilities Modification : AC=KMCT
- Local Road Modification: AC= KMLR
- Show HS Alignment line. No station Labels. LV=1019, LW=6
- Show Roadway Alignments as needed. No station Labels. LV=13, LW=4
- Background map showing roadway line work and names only (CO=140)
- Street names shall be TX=0.14x, FT=3, LV=60



## ROADWAY GRADE SEPARATION PLAN AND PROFILE

- Notes shall be located at the top right corner of the sheet.
  - Plan & Profile titles shall be TX=0.24x, FT=43, LW=0, LV=10
  - Notes title shall be TX=0.175x, FT=3, LW=2, LV=23
  - Leaders and Dimensions shall be TX=0.14x, FT=3, LV=23
  - Notes and callouts shall be TX=0.14x, FT=3, LV=23
  - Superelevation diagram designed only for State Highways (not local roadways).
  - Vertical Alignment showing key existing features (ground, water bodies, over and under crossings)
  - Label HST track (S2) and other parallel and /or transverse highways and railroads
  - AC=MATCH LINE for Match line text and symbology
  - AC=GR-SCALE for scale bar (full size scale)
  - Critical Clearances shall be confirmed and noted on plan and profile views
  - Curve, tangent and/or retaining wall numbers/tables show in plan view
  - Right-of-Way limits including temporary easements. Label Track Right of Way as "PROP ROW". Label Temporary Construction easement as "PROP TCE" at each Matchline.
  - Indicate required driveway relocations
  - Show proposed Systems sites
  - Radius callouts for access roads
  - Label conforms points (STA and ELEV)
- Line/curve data tables for road alignment geometry and retaining wall table as needed. Below standards apply to the tables:
    - Table Headings shall be TX=0.175x, FT=3, LW=2, LV=23
    - Text with tables shall be TX=0.14x, FT=3, LW=1, LV=23
    - Exterior Border lines shall be LV=23, LW=2
    - Interior vertical column lines and column heading line shall be LV=23, LW=1
    - Interior horizontal row lines: LV=23, LW=0



## UTILITY COMPOSITE PLANS

- Notes shall be located at the top right corner of the sheet.
- Leaders and Dimensions shall be TX=0.14x, FT=3, LV=860
- Notes title shall be TX=0.175x, FT=3, LW=2, LV=860
- Notes and callouts shall be TX=0.14x, FT=3, LV=860
- 100' scale
- Right-of Way limits including utility easements. Label Track Right of Way as "PROP ROW" at each Matchline.
- Label HST tracks (S1, S2, et al) and other parallel and /or transverse highways and railroads
- Show Utilities to be removed and/or relocated
  - Pattern portion of the utility being affected - AC=UTIL-RMV-RLOC
  - No LF required
  - Numerical callout to corresponding chart detailing facility, owner and mitigation
  - If known, show proposed relocation with leaders showing "TO" and "FROM"
- Show drainage facilities that shall be under other's agencies/jurisdictions



## UTILITY PROTECTION AND RELOCATION PLAN AND PROFILE

- For High Risk Utilities
- 1"=50' Horizontal ; 1"=10' Vertical
- Leaders and Dimensions shall be TX=0.14x, FT=3, LV=860
- Label HST tracks (S1, S2, et al) and other parallel and /or transverse highways and railroads
- Notes title shall be TX=0.175x, FT=3, LW=2, LV=860
- Notes and callouts shall be TX=0.14x, FT=3, LV=860
- Right-of Way limits including utility easements. Label Track Right of Way as "PROP ROW" at each Matchline.
- Show High Risk Utilities to be removed and/or relocated
  - Pattern portion of the utility being affected - AC=UTIL-RMV-RLOC
  - No LF required
  - Label "BEGIN" and "END" of removal



## GRADING AND DRAINAGE PLAN ALONG TRACK ALIGNMENT

- Notes shall be located at the top right corner of the sheet.
  - Leaders and Dimensions shall be TX=0.14x, FT=3, LV=860
  - Notes title shall be TX=0.175x, FT=3, LW=2, LV=860
  - Notes and callouts shall be TX=0.14x, FT=3, LV=860
  - Show line style for ditch/swale center LS=rd-flowIn, LW=1
  - All proposed drainage line work, including pipes, ditches and anno: LV=824 ut-stormD-p
  - No pipe sizes or slopes on drainage annotation
  - Label HST tracks (S1, S2, et al) and other parallel and /or transverse highways and railroads
  - Right-of Way limits including utility easements. Label Track Right of Way as "PROP ROW". Right-of Way limits. Label Track Right of Way as "PROP ROW".
  - No proposed drainage line work shown when alignment is within trench, tunnel and cut-and-cover structures
  - Show/Label connections to existing drainage
  - Show limit of grading for track
  - Show limit of detention basin only.
  - Show floodplain information. LS=ph-FL for 100yr boundary
  - Show Grade Separation alignment only. No proposed master line work. Place note to refer to the corresponding grading and drainage roadway sheet.
- Flow arrows are permissible to indicate direction of flow to provide additional clarity





## **APPENDIX C –PRELIMINARY ENGINEERING FOR PROCUREMENT DRAWING SAMPLE PLANS**

