



| Caltrain – Standard Procedure | |
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| DESIGN VARIANCES | |
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Caltrain
Standard Procedure
For
Design Variances

Version 1a
October 8, 2019



**Document Revision History
Caltrain Standard Procedure
For
Design Variances**

| Revision Date | Revision No. | Revision Summary Description |
|----------------------|---------------------|---|
| 08/15/2007 | 0 | First Issue |
| 2/13/2019 | 1 | Removed dates referencing Engineering Standards, Added Operations to Design Variance Submittal Sign-off sheet and other updates. |
| 10/08/2019 | 1a | Section 5 – Clarified that a copy shall be maintained in the “Record Management System.” Deleted “Tracking Number” from the Appendix A, Part 1 form. |
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1. INTRODUCTION AND OBJECTIVES

Caltrain's engineering design standards are embodied in the following documents:

- Design Criteria
- Standard Drawings
- Standard Specifications
- PCJPB Standard for Design and Maintenance of Structures
- PCJPB Engineering Standards for Excavation Support Systems.

These documents establish the uniform and minimum standards for planning, design, and construction of Peninsula Corridor Joint Powers Board (PCJPB or JPB) projects for Caltrain facilities and systems. The engineering standards are controlled documents subject to regular revision. The version of the standards applicable to each project is the version in effect when the project reaches the 35% Design stage.

The documents are based on best industry standards and accepted practices for Commuter/Class 1 railroads and equal or exceed regulatory requirements. The documents are intended to cover the majority of Caltrain's current and future improvements. The documents do not attempt to cover all the situations that might be encountered or requested throughout a project's life. Future large projects such as Electrification, Dumbarton Rail Corridor, and Transbay Terminal (Downtown Extension) may have their own supplementary criteria. The documents are intended to provide the designer with flexibility while ensuring that the functionality, goals and objectives of the Caltrain System are met. The documents shall be used in conjunction with sound engineering judgment, experience and standard practices. The documents in no way replace the individual designer's adherence to the profession's "standard of care" in design.

It is important to note that Caltrain considers the Design Criteria to be a strong guideline. Any intent by the designer to use a more restrictive, lower dimensioned, higher stressed, or in any way less functional design solution than that identified in the Design Criteria, will require that a design variance request be prepared and processed.

Under certain circumstances, it may be appropriate and necessary for a project designer to seek a variance to the engineering standards. The objectives of this Standard Procedure are to define under what conditions a design variance may be requested, to standardize the process for defining design variance requests, and to standardize the process for reviewing and approving/denying such requests.

2. DEFINITIONS AND ACRONYMS

Caltrain System – The railroad; right-of-way; tracks; structures; terminals; stations; rolling stock; fare collection equipment; control and communications equipment and software, maintenance equipment and facilities; operating and maintenance schedules, personnel, rules, and procedures; and support facilities and equipment all of which comprise the commuter rail service between San Francisco and Gilroy, California.

Caltrain Engineering Standards – The Caltrain engineering standards include Design Criteria, Standard Drawings, and Standard Specifications.

Configuration Management – The process of managing the components of the Caltrain System to ensure (i) that they possess the desired physical and functional characteristics, (ii) that changes to these characteristics are implemented in a controlled manner, and (iii) that existing documentation accurately reflects the condition of the system.

Construction Phase – This is the time period for a project, from issuance of construction contract documents for bid until completion and close-out of the procurement/construction contract.

Design Basis Report/Memorandum – A report/memorandum, prepared by the designer, that details the engineering standards to be used in the design of a specific project. The design basis report/memorandum is normally submitted to the Project Manager during the preliminary engineering portion of the design phase of a project. The design basis report/memorandum documents all approved design variances.

Design Phase – This is the time period for a project, from completion of a PSR, or PSR equivalent document, until the completion of contract documents suitable for solicitation of bids.

Design Variance - An approved and authorized variance to Caltrain engineering standards. Design variances are normally applicable only on a project specific basis.

Project Manager – The individual responsible for the project including the execution of the design process and the timely conduct of design reviews.

PSR – The Project Study Report which documents, at a conceptual level, the design, scope, schedule and budget for a project. The PSR normally constitutes the baseline against which project changes are measured.

Requestor – The individual responsible for the promulgation, description, analysis and timely resolution of a design variance request for a specific project.

Standard Procedure (SP) - Any of a number of controlled documents which define Caltrain procedures for the conduct of project development and other work.

3. CONDITIONS FOR A DESIGN VARIANCE REQUEST

In the course of developing the design of a capital project, it may become apparent to the designer, project manager or other involved design professional, that having the parameters of the project meet all Caltrain engineering standards may be infeasible, or feasible at potentially excessive cost and/or impact to the agency. These circumstances should materialize at the Project Study Report phase and/or the preliminary engineering phase of the project's design development. The Requestor (designer, project manager or other involved design professional) shall determine that a design variance request is appropriate to the situation and shall take appropriate action (per this procedure) to resolve the design issue(s).

In particular, it is important for the Requestor to identify potential variances from Caltrain engineering standards as early in the planning and design process as possible, to allow time to research and analyze alternatives, to document recommendations, and to minimize the overall impact of a design variance on the project and on the Caltrain System. This should be done during the Project Study Report phase for major projects and the scope development process for minor projects. All significant design variances

must be addressed at or before the submittal of the Design Basis Report or Memorandum prepared during preliminary engineering. However, should the benefit of minor additional variances become apparent during detailed design, they should be obtained as part of each PS&E design review submittal, as applicable.

4. DESIGN VARIANCE IDENTIFICATION AND JUSTIFICATION

A design variance can only be obtained on a project specific basis.

A design variance can only be obtained by a Requestor who shall be responsible for the expeditious processing of his/her design variance request.

To provide for consistent identification and justification, and to allow internal tracking, a design variance request shall be submitted using the standard template shown in Appendix A (Part 1 – Memorandum). The last page of the design variance submittal shall be the sign-off sheet (Part 2) also shown in Appendix A.

At a minimum, the following information shall be included in the request:

PART 1 - Memorandum

1. Project Name
2. Project Number
3. Current Estimate – Estimated construction cost of the project.
4. Potential Project Cost Reduction if Variance Authorized.
5. Date decision is required before it impacts project schedule.
6. Project Description – general project information, general plan, typical section, project limits by milepost, county, etc.
7. Variance Definition/Request:
 - a. Identify Standard(s) and/or Criteria to which variance will apply.
 - b. Define variance required from Standard(s) and/or Criteria.
8. Justification
 - a. Provide concise reason for request. (engineering hardship, feasibility, cost savings, reduced impact to agency, etc.)
 - b. Provide precedent for adoption of relaxed or changed Standard and/or Criteria (if precedent exists).
 - c. Provide engineering basis for adoption of relaxed or changed Standard and/or Criteria (for example, the revised criteria would be safe for pedestrians; or would allow trains to operate safely and efficiently; or would still be compliant with regulatory requirements).
 - d. Assess and evaluate impacts other than costs of implementing the variance including impacts to other design features, ROW, environmental effects, preservation of historical feature, construction issues, social concerns, reduction of design life, compatibility with adjacent roadway features, engineering discretion.
9. Attachments
 - a. Sketches or drawings
 - b. Details of precedent
 - c. Calculations
 - d. Studies
 - e. Other Supporting Information

PART 2 – Sign-off Sheet

10. Sealed by preparer and signed by Requestor.
11. Concurrence/non-agreement and approval/denial by Caltrain management. Sufficient written detail and explanation must be provided to facilitate review of the request. At some point, this justification may be used to defend Caltrain's and/or the designer's design decisions. All requested deviations from standards must be uniquely identified, located, and justified.

5. VARIANCE SUBMITTAL AND REVIEW PROCESS STEPS

The Requestor (if not the Caltrain Project Manager), shall submit the completed design variance request to the Caltrain Project Manager who will review the request for completeness. The completed Design Variance Request shall include the stamp(s) (seal(s)) and signature(s) of the Responsible Registered Engineer(s) who prepared the technical content. If complete and acceptable to the Project Manager, he/she shall approve the submittal and forward it to the Caltrain Manager, Engineering Standards. The Engineering and Maintenance Department shall assign a reference number to each request. The submittal shall then be reviewed by appropriate personnel within the Caltrain Engineering and Maintenance Department. Requests judged to be incomplete by Engineering and Maintenance Department personnel, shall be returned to the Project Manager. Each Request shall be reviewed on a case by case basis and approved or denied on its merits. The basis for approval or denial shall be documented as an attachment to the request submittal memorandum (see Appendix A). After concurrence by Engineering and Maintenance Department personnel, the request will be reviewed by the Manager, Rail Operations Planning. After concurrence by Rail Operations, the request will be reviewed by the Deputy Director, Quality Assurance and Standards. The Deputy Director, Quality Assurance and Standards shall then approve or deny the request. The Engineering and Maintenance Department shall maintain a copy filed in the Record Management System under the assigned reference number for future use.

If approved, the request file shall be forwarded to the Chief Operating Officer, Rail for final review and approval/denial. If approved, the Chief Operating Officer, Rail shall return the file to the Project Manager who in turn shall advise the Requestor of the approval.

If denied, the request file shall be returned to the Deputy Director, Quality Assurance and Standards who will note the denial and then forward to the Project Manager who in turn shall advise the Requestor of the denial. A Requestor may resubmit a Design Variance Request but may only do so if significant revisions to the originally denied submittal have been made.

Appendix B shows the process flowchart for the Design Variance Request.



6. INCORPORATION OF APPROVED DESIGN VARIANCES

It shall be the designer's responsibility to incorporate the approved design variance into the on-going design work. The project design file shall include the approved design variance request file as returned to the designer by the Project Manager.

**APPENDIX A – DESIGN VARIANCE SUBMITTAL STANDARD TEMPLATE
(PART 1 – MEMORANDUM)****SUBMITTAL MEMORANDUM**

| | |
|------------------------------|--|
| For Caltrain use only | |
| Reference No: | |

To: _____ **Date:** _____
Manager, Engineering, Standards

| | | | |
|------------------------------|--|---|--|
| Project Name: | | | |
| Project Number: | | | |
| Current Estimate: | | Cost Reduction if Variance Authorized: | |
| Decision required by: | | | |

Project Description:

Variance Definition/Request:

Justification:

Attachments:

| | |
|--|---------------------------------|
| ** For Caltrain use only ** | |
| Caltrain Design Variance – Engineering Staff Recommendation | |
| Approve <input type="checkbox"/> | Date: |
| Deny <input type="checkbox"/> | Date: |
| Caltrain Design Variance Decision | |
| Decision: Approved <input type="checkbox"/> | Denied <input type="checkbox"/> |
| Approval Date: | Denial Date: |
| Comments: See below and attachment | |
| | |



APPENDIX A – DESIGN VARIANCE SUBMITTAL STANDARD TEMPLATE
(PART 2 – SIGN-OFF SHEET)

Prepared by:

Registered Engineer

Professional Engineer's Seal
(for each applicable discipline)

Requested by:

Requestor or Consultant Project Manager

Date

Name of Consulting Firm (if applicable)

Caltrain Project Manager

Date

Concurred by: Engineering and Maintenance (include only applicable signatures)

Manager, Maintenance of Way

Date

Manager, Engineering, Structures and Facilities

Date

Deputy Director, Railroad Systems Engineering

Date

Concurred by: Rail Operations

Date

Manager, Rail Operations Planning

Date

Approved by:

Deputy Director, Quality Assurance and Standards

Date

Chief Operating Officer, Rail

Date



APPENDIX B

Design Variance Request Process Flowchart

