20-11 ESTABLISHING BRIDGE SEISMIC DESIGN CRITERIA

This memo establishes a procedure for introducing new bridge seismic design policy or revisions to current seismic design policy. The attached flow charts and descriptions outline how proposed changes to the seismic design criteria are introduced and processed (see Flow Chart No. 1). The methodology provides two alternatives; proposed criteria modifications associated with specific PS&E projects, and proposed criteria modifications not associated with specific projects. (See Flow Charts No. 2 & No. 3)

The flow charts and descriptions refer to the Earthquake Committee (EQC) which is comprised of an Executive Committee and a General Committee. Members of both Committees are identified in Memo to Designers 1-2. Attachment 1. The flow charts and descriptions also refer to the Caltrans Seismic Design Criteria (SDC).

Richard D. Land
Bridge Design Branch A

Shannon H. Post
Bridge Design Branch B

Michael A. Barbour
Bridge Design Branch C

TO: pal

New Memo

Chart No. 1 - Organization

Chart No. 1 illustrates how seismic design criteria and seismic related policies are distributed through the OSD Bridge Design Branch (BDB) Chiefs. The BDB Chiefs must approve all project specific seismic design criteria and proposed modifications to the SDC. Revisions to the SDC will be distributed by OSD through memoranda or updates to the OSD design manuals.

Chart No. 2 - Proposed Project Seismic Design Criteria (PSDC) Associated with PS&E Package

Chart No. 2 describes the process for evaluating seismic related issues relating to a specific PS&E project or series of projects (e.g. corridor criteria pertaining to several projects). The final products of this process are approved Project Seismic Design Criteria (PSDC), and a review of the current SDC. The chart outlines a three-phase process. Phase I is a preliminary evaluation of the proposal that includes an assessment of the resources required for developing and implementing the proposed PSDC. Phase II contains the development and approval of the PSDC. Phase III provides for an assessment of the SDC to determine if any of the information in the PSDC should be incorporated into the current SDC.

Phase I

Process Box #1, the initial introduction of a PSDC, either a self contained criteria or project specific modifications to the SDC. The Project Engineer should seek preliminary approval from the Design Engineer/Project Manager* prior to the Type Selection Meeting** (Decision Box # 2). If the PSDC is not valid, the Design Senior/Project Manager will determine if additional work is necessary (Decision Box # 5), or if the current SDC without modifications is appropriate for the project (Process Box # 6). The Design Senior/Project Manager will determine if a valid PSDC requires approval from the BDB Chiefs prior to Type Selection (Decision Box # 3). BDB Chief approval is required if the proposed criteria deviates significantly from the current SDC or requires additional resources for development which were not included in the project budget.

* Design Senior: OSD or OSM&I Design Section Leader and/or OSD Senior Seismic Specialist

Project Manager: EFPB Liaison Engineer, CCMB Contract Managers, or Local Assistance Senior Engineer

** Type Selection Meeting represents either the type selection meeting for new projects or the seismic retrofit strategy meeting for existing bridges.

The BDB Chiefs will decide whether the PSDC is valid or requires additional investigation prior to Type Selection (Decision Box # 7). The BDB Chiefs may enlist the help of the EQC (Process Box # 7a) in this decision. If the Design Senior/Project Manager determines BDB Chief review is not required, the project may proceed to Type Selection (Process Box # 4). The final decision on the PSDC will be contingent upon the Type Selection Panelís recommendation (Decision Box # 8).

It is the responsibility of the Project Engineer/Project Manager to begin the criteria development process well in advance of the Type Selection Meeting to ensure all significant seismic issues are evaluated in the type selection process.

Phase II

Process Box # 8 represents the Type Selection Meeting. The BDB Chiefs, or a representative briefed on the issues, will be present. The Project Engineer/Project Manager will present justification for the PSDC. Under the direction of the BDB Chiefs a decision on whether the PSDC is accepted, rejected or requires modification will be made. If the PSDC is rejected, the SDC will become the project seismic design criteria. If the PSDC is approved, the process migrates to Criteria Circle #12. The PSDC may be approved conditionally, contingent on further review at a technical seismic criteria meeting (Decision Box # 9). Attendees of the technical seismic criteria meeting shall include: appropriate members of the General EQC, and either the Design Engineer, Senior Seismic Specialist, and Project Engineer for OSD and OSM&I projects, or the Project Manager for OPPM&S projects.

Process Box #10 requires the PS&E Project Engineer/Project Manager to develop and document the final PSDC. The Chief of the Branch responsible for the project shall procure additional resources to complete the final project specific criteria if required. Once the criteria are finalized, the process migrates to Criteria Circle #12.

Phase III

The BDB Chiefs will decide if any of the issues addressed in the PSDC should be reviewed for incorporation into the SDC (Decision Box #13). The review will be based on the technical merit of the proposed changes, impact on resources, and a cost/benefit analysis of implementing the proposed modifications. Typically the BDB Chiefs will consult the Executive EQC who in turn may consult with the General EQC and/or other OSD technical committees (Process Box # 13a). The product of this evaluation is a revised SDC represented by Process Boxes #15 and Criteria Circle #16, or retention of the existing SDC (Process Box #14). The distribution of the revised SDC is according to Chart No. 1.

Chart No. 3 - Proposed Revision to the Current Seismic Design Criteria Not Associated with PS&E Projects

Chart No. 3 describes the process to evaluate seismic issues which are independent of a specific PS&E package. The final product of this process is verification of or enhancement of the existing seismic design criteria. The chart diagrams a preliminary evaluation to determine if the existing criteria should be enhanced or revised. The evaluation will be based on the technical merit of the proposed modification(s), impact on resources, and a cost/benefit analysis of implementing the proposal.

Process Box # 1 represents the formal introduction of a seismic issue or proposed modification to the existing seismic design criteria by Design Engineers, Earthquake Committee, OEE&DS Contract Managers and Design Reviewers, Research Contract Managers, and others. Following the formal introduction of the proposal, the BDB Chiefs will circulate the proposal to the Executive EQC for review, who in turn may consult with appropriate General EQC members and/or other OSD technical committees (Process Box # 2a). The product of this evaluation will be a decision whether to formally consider the proposal for adoption or to reject it.

Decision Box #2 represents a proposal review meeting where the BDB Chiefs or their representatives, and the proposal reviewers (Process Box #2a) will decide to modify the SDC or reject the proposal. If the proposal is rejected, the individual(s) responsible for the proposal are notified with an appropriate explanation (Process Box # 3). Rejections are kept on file by the EQC Chairperson to avoid future duplication of effort, and the existing criteria are retained (Criteria circle # 4). If the decision is made to pursue modifying the existing seismic design criteria, The EQC Chairperson will assign a work team to develop and document the revisions to the SDC (Process Boxes # 5). The revisions will be routed to the BDB Chiefs for final approval, (Decision Box # 6) and are either returned to the review team for additional work or incorporated into the SDC (Criteria Circle #7) and distributed according to Chart No.1.

Establishing Bridge Seismic Design Criteria

Chart No. 1- Organization

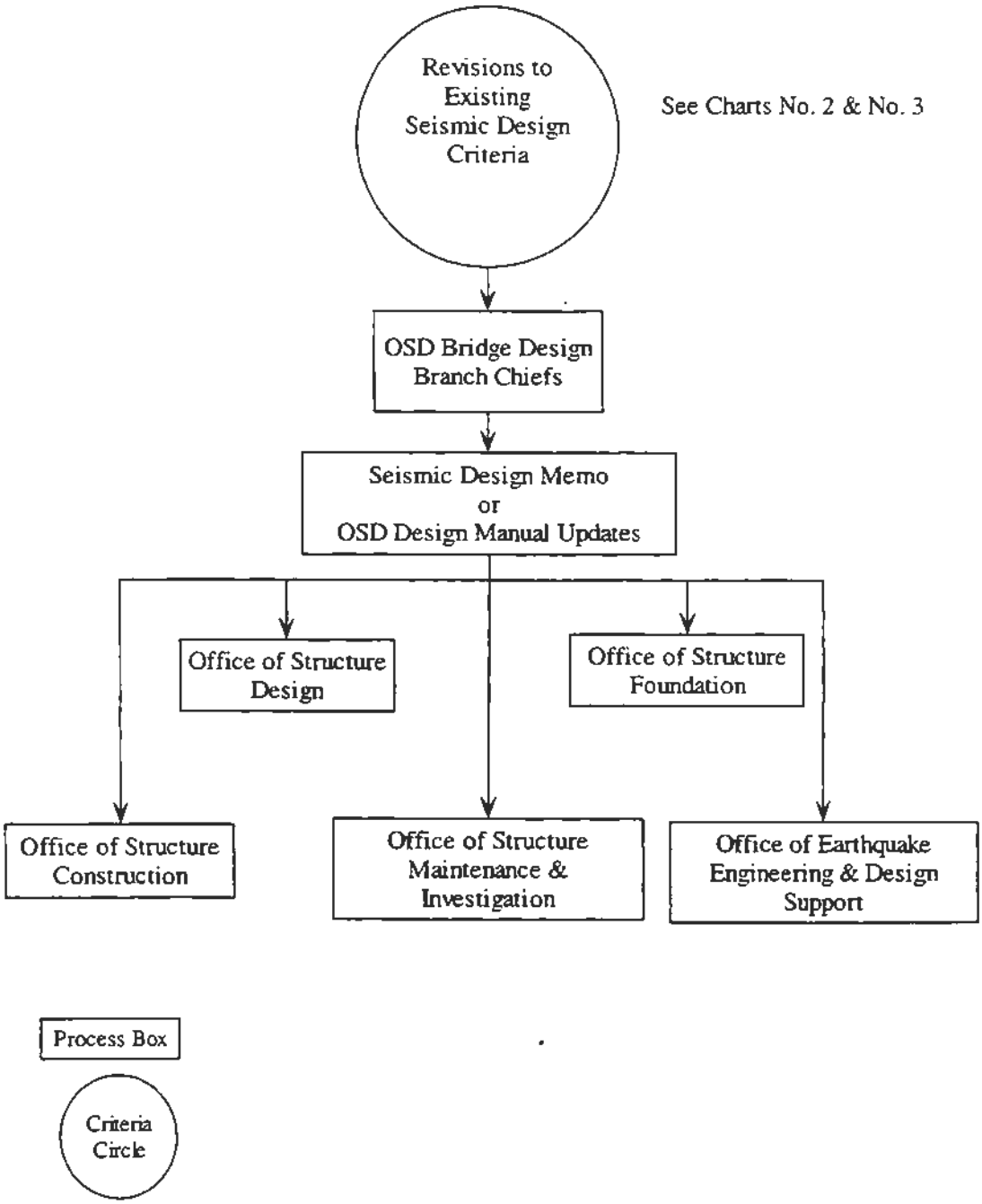
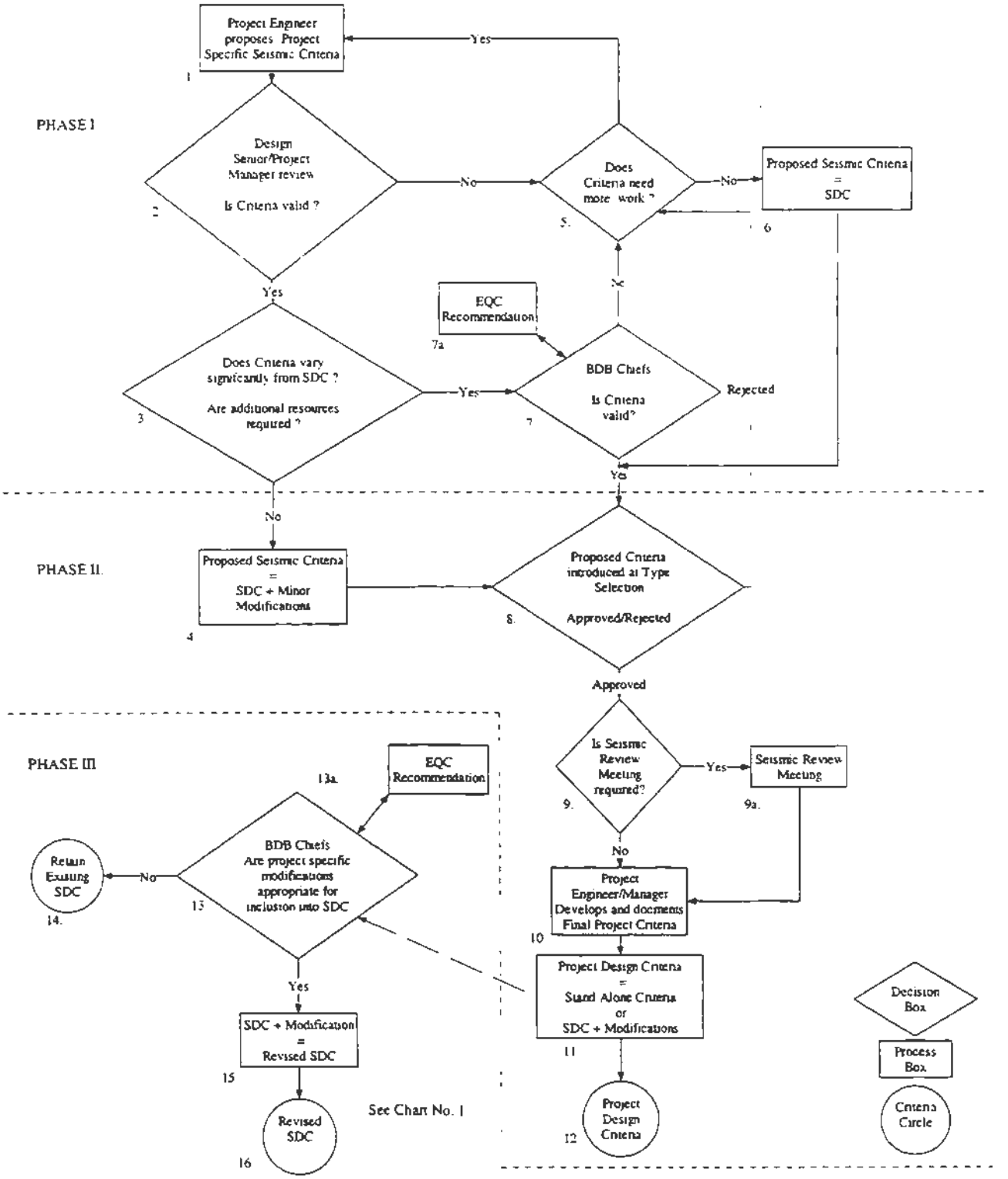


Chart No. 2 - Caltrans Bridge Seismic Design Criteria Development/Retention (Associated with a PS&E Package)



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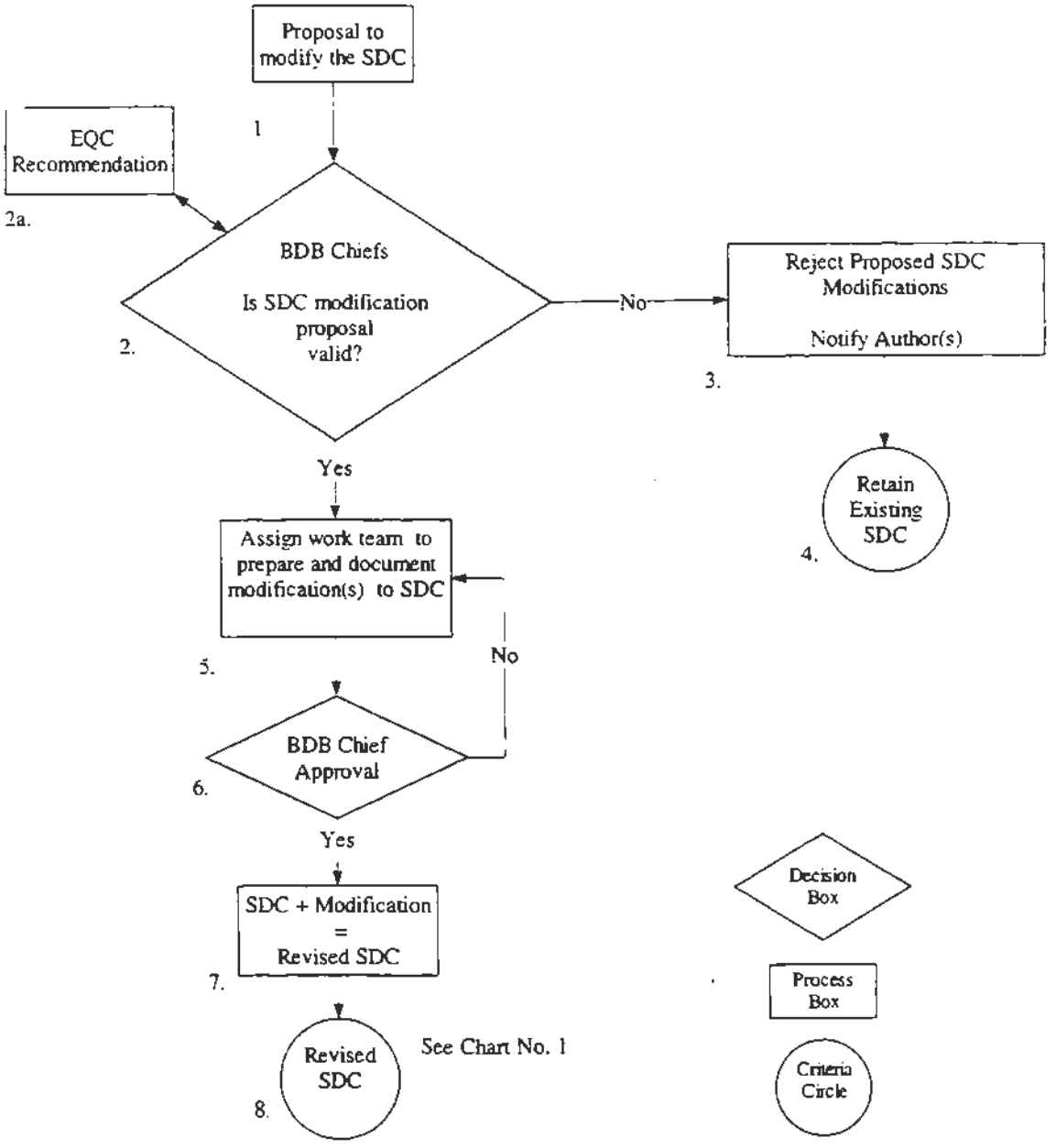
Chart No. 3 - Proposed Revisions To Current Seismic Design Criteria (Not Associated With A PS&E Package)