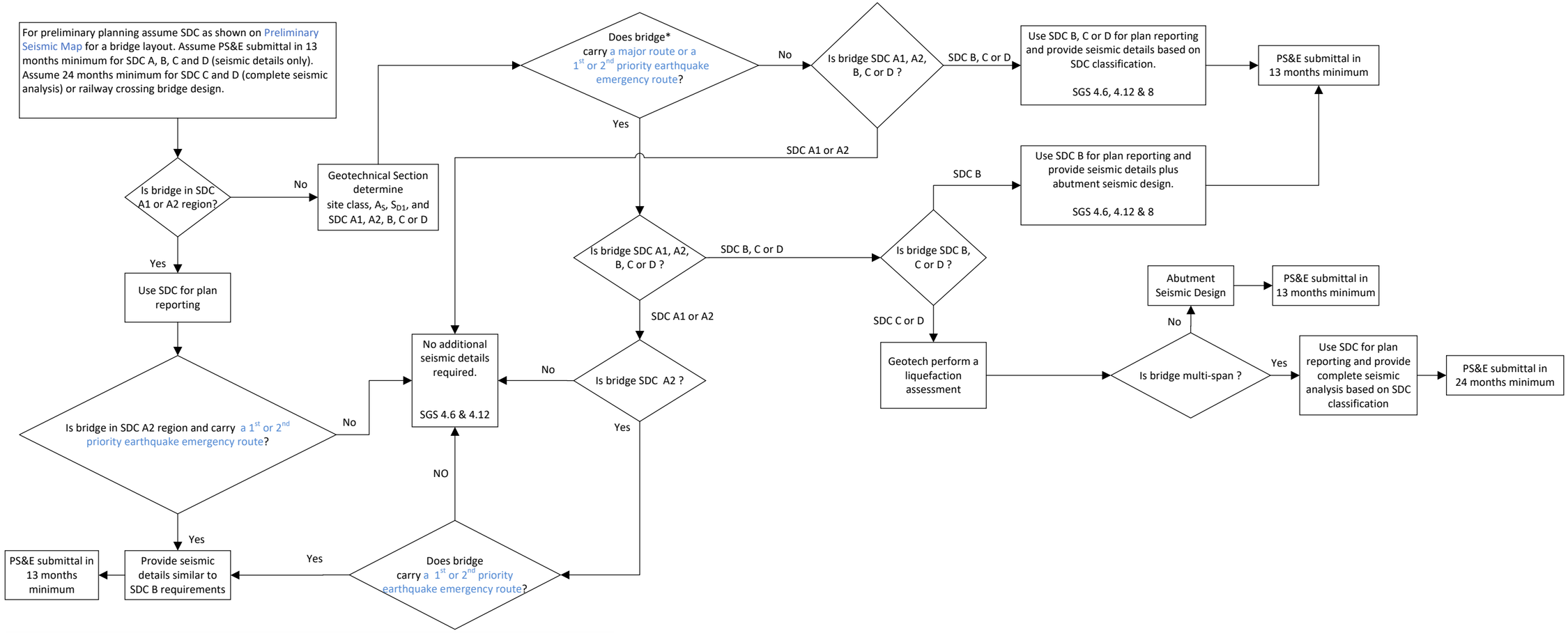
Bridge Seismic Planning Flowchart

March 2024

For retrofit, See Bridge Seismic Retrofit flowchart



Seismic Design Category/Seismic Zone by Code		
Value of design spectral acceleration coefficient at 1.0 second period, S_{D1} SGS 3.4.1 and 3.5	[1]AASHTO Guide Specifications for LRFD Seismic Bridge Design (SGS) SGS Table 3.5-1 **Seismic Design Category (SDC)**	[2]AASHTO LRFD Bridge Design Specifications (LRFD) LRFD Table 3.10.6-1 **Seismic Zones**
$S_{D1} < 0.10$	A1	1
$0.10 \le S_{D1} < 0.15$	A2[3]	1[3]
$0.15 \le S_{D1} < 0.30$	B	2
$0.30 \le S_{D1} < 0.50$	C	3
$0.50 \le S_{D1}$	D	4

[1]SGS is required for seismic design. LRFD is shown because SGS refers to LRFD for support, and understanding the equivalency category and zone may be important. In accordance with SGS, all bridge designs must meet the requirements for SDC A (Seismic Zone 1). Additional seismic details are typically required for higher seismic design categories.

[2]LRFD S_{D1} ranges are slightly different. Use SGS as shown.

[3]Structural members shall be detailed in accordance with SDC B (SGS 8.2) if bridge carry a 1st or 2nd priority earthquake emergency route.

Note: See State Bridge Engineer for Major Bridges.

Seismic Design Category (SDC) based on Risk-targeted design spectra return from preliminary USGS 2018 National seismic hazard model, NSHMP Static Data Services (usgs.gov).

Preliminary Seismic Design Map: Preliminary seismic regions with major routes and 1st and 2nd priority earthquake emergency routes statewide map based on soil site class D. For additional information, See SEG 24-01.

* Seismic design of overpass should be considered when overpass bridge collapse would greatly impede emergency traffic for the main route. (i.e., No access ramps).

Geotechnical Section (GS)

Plans, Specs and Estimates (PS&E)

If bridge cross a railroad, the bridge PS&E submittal is in 24 months minimum.

For bridge retaining walls the timeline for PS&E submittal is same as the supported bridge.