

## 2.2 APPROACH SLABS

### 2.2.1 GENERAL

This BDM provides guidance on the use of the approach slab systems as described in STP 2.2.

A reinforced concrete approach slab provides a smooth transition between the roadway pavement and bridge superstructure and, as appropriate, consists of some or all of the following:

- Positive subgrade drainage system behind the abutment
- Compaction in the embankment behind the abutment backwall to reduce the impact of dynamic loads imposed by heavy traffic on the bridge, causing differential settlement issues<sup>1</sup>
- Designed as a slab bridge to provide temporary access for emergency situations, such as, when an earthquake affects the bridge or scour occurs behind the abutment and ingress or egress to the bridge is compromised, and alternative detour is not available<sup>6</sup>

### 2.2.2 DESIGN PROCEDURE AND CONSIDERATIONS

Selection of the appropriate approach slab type requires an evaluation of information from several sources and some assumptions based on good engineering judgement.

Appropriate type selection shall comply with the flow charts<sup>6</sup> in STP 2.2 and general requirements from the Highway Design Manual (HDM)<sup>5</sup> Section 209. Standard Plans<sup>3</sup> should be referenced into the structure plans PS&E Package and site-specific details may be required.

Approach slab details differentiate between project types (new construction, rehabilitation, and widenings).

#### 2.2.2.1 New Construction

Standard Plan<sup>3</sup>, B9-5, Type E-1 detail (approach slab cantilevers over the wingwall) is preferred over the Type E-2 detail.

#### 2.2.2.2 Rehabilitation

The scope of a rehabilitation project entails replacement of the existing approach slab or removal of existing facilities and placement of an approach slab<sup>4</sup>. Consult the Office of Structure Maintenance and Investigations (SM&I) as to any additional maintenance scope required. Standard Plan<sup>3</sup>, B9-5, Type E-2 detail (approach slab is bound by wingwall or

retaining wall) should be selected; however, if the design deviates, modified details should be provided in the structure plans.

Note that joint seal replacement is required when replacing approach slabs. Consideration should be given to replacing existing joint seals full width, even on partial width approach slab rehabilitation projects, and attention should be given to material preferences for the approach slab and base. If the movement range is greater than ½" for existing diaphragm type abutment, a modified detail should be provided. Paving notch extensions are required when the existing paving notch width is less than 6 inches for existing end diaphragm abutments. Consider reconstructing the bridge paving notch extension full width. If paving notch dimensions differ from Standard Plans<sup>3</sup>, provide modified paving notch details in the structure plans.

### 2.2.2.3 Widening

The scope of a widening project should consider whether replacement of the existing approach slab is desirable. A minor widening of a bridge with approach slabs in good condition<sup>2</sup> should consider widening the approach slab in-kind. A major widening of a bridge or approach slab in poor condition<sup>2</sup> should use details for new construction and the existing approach slab should be replaced or rehabilitated (e.g. remove unsound concrete & place rapid setting concrete (patch), polyester concrete overlay, mudjacking). Widen approach slabs in-kind as much as possible. For widenings that use new construction details, a minimum transverse width calculation should be made to ensure that the new approach slab and wingwalls can accommodate barrier impact and other loads.

## 2.2.3 QUANTITIES

Typical bid items are:

- Structural Concrete, Approach Slab
- Structural Concrete, Approach Slab (Type N)
- Structural Concrete, Approach Slab (Type R)
- Structural Concrete, Approach Slab (Type EQ)

Quantities should be calculated for paving notch extension and aggregate base for rehabilitation projects. Assume 10% of the structural concrete quantity for aggregate base for rehabilitation projects using Structural Concrete, Approach Slab (Type R). If voids are caused by removing subsealing material or cement treated base, refer to Section 51-5.03D(3) of the Standard Specifications<sup>4</sup> for more information.

Note: Constructing paving notch extensions, replacing joint seals, and cleaning expansion joints at the abutment are considered separate pay items. When specifying Structural Concrete, Approach Slab (Type R) adjacent to a diaphragm type abutment, the cost of cleaning the existing joint is included in the approach slab work.

## 2.2.4 REFERENCES

1. Caltrans. (2014). *Geotechnical Manual, Embankments*, California Department of Transportation, Sacramento, CA.
2. Caltrans. (2020). *Bridge Element Inspection Manual, 3.7 Approach Slabs*, California Department of Transportation, Sacramento, CA.
3. Caltrans. (2025). *Standard Plans, 2025 Edition*, California Department of Transportation, Sacramento, CA.
4. Caltrans. (2025). *Standard Specifications, 2025 Edition*, California Department of Transportation, Sacramento, CA.
5. Caltrans. (2025). *Highway Design Manual, 7<sup>th</sup> Edition*, California Department of Transportation, Sacramento, CA.
6. Caltrans. (2025). *Structure Technical Policy, 2.2 Structural Approach Slab*, California Department of Transportation, Sacramento, CA.