5-3 STRUCTURE APPROACH

General

Structure approach pavement systems are used on all portland cement concrete pavements and on multi-lane (2 or more lanes in one direction) asphalt concrete pavements located within currently designated urbanized areas. The current boundaries of urbanized areas are shown in yellow on the official State Highway Map.

The structure approach provides a smooth transition between the highway pavement and bridge superstructure and, as appropriate, consists of some or all of the following:

1. Reinforced concrete approach slab attached to the structure.
2. Positive subgrade drainage system behind the abutment.
3. Superior compaction in the fills approaching the structure.

The following standard drawings supersede all previous details for structure approach slabs. Those previous details include Class A, Class B, Type I, Type II, etc. For new construction, Structure Design will determine the need for a structure approach. For rehabilitation, the District will identify the need (full width or specific lanes). In either case Structure Design will select the appropriate details and prepare PS&E.

Bridge Standard Detail Sheet	XS Sheet Number
Structure Approach Type N(14) Details No. 1	XS 22-16.0
Structure Approach Type N(14) Details No. 2	XS 22-16 .1
Structure Approach Drainage Details	XS 22-17
Structure Approach Type N(9S)	XS 22-18
Structure Approach Type R(9S)	XS 22-19
Structure Approach Type R(9D)	XS 22-20
Structure Approach Type EQ(3)	XS 22-21
Structure Approach Type R(3S)	XS 22-22
Structure Approach Type R(3D)	XS 22-23
Structure Approach Type N(9D)	XS 22-24

Where N = New Construction, R = Rehabilitation, S = Seat Type Abutment, D = Diaphragm Type Abutment, EQ = New Seismic Slab. The numbers 3, 9 and 14 refer to the approximate length in meters of the structure approach.

Memo converted to metric.

The attached flow charts, prepared by Office of Project Planning and Design will be used to select the appropriate type. Variances due to unusual circumstances are allowed subject to approval by the District Design Coordinator Reviewer. Minor variances in the length of structure approach will not require this approval.

Selection of the appropriate type requires an evaluation of information from several sources and some assumptions based on good engineering judgement. The selected type should be shown on the General Plan, and all assumptions documented in the letter of transmittal to the District. This procedure will allow the District time to request a variance should unusual circumstances be evident.

These plans differentiate between common abutment conditions (static, or seat type, and dynamic, which includes end diaphragms and strutted abutment) and project type (new construction and rehabilitation). These plans are general and will cover most situations. They should not be modified. Additional or special details may be required. The designer should consider the following:

New Construction

Movement rating, wingwall details, and location of drainage exit should be shown on the Abutment Details sheet. The Type E-1 Edge Detail (structure approach cantilevers over the wingwall) should always be selected unless inappropriate. Note that the structure approach should extend for the full abutment width and the wingwall should be designed for an "H" up to finished grade.

Rehabilitation

Consult the Office of Structure Maintenance and Investigations as to any extra work required. Consideration should be given to replacing existing joint seals full width, even on partial width structure approach rehabilitation projects. Consideration should also be given to upgrading the abutment drainage where feasible.

Specific details may be shown on the General Plan (for example; traffic staging or work to be done) or listed in a table (for example; quantities, movement rating, abutment type, etc.). Note that a paving notch extension is required when the existing paving notch width is less than 150 millimeters.

Widenings

Please refer to Memo to Designers 9-3 for a general policy. Consideration should be given to the existing structure approach, the project scale and anticipated future modification. For example, a minor widening of a structure with good approaches may repeat the existing details. A major widening of a structure with poor approaches should use details for new construction, and the existing approach should be rehabilitated or replaced.

Highway Items

In addition to structural details, the standard drawings also provide details showing the transition of highway items onto the structure, including metal beam guardrail, dike and drainage outlet details. These elements are roadway items and are not part of the structure estimate. Their actual location and specific details should be shown on the road plans.

Quantities

Structural Concrete, Approach Slab Type N; Structural Concrete, Approach Slab Type R; and Structural Concrete, Approach Slab Type EQ are paid in CM and include all structure approach items including reinforcement, treated permeable base, transverse joint seals at sleeper slab, miscellaneous metal and drainage items. Quantities for separate pay items should be calculated for paving notch extensions (in CM) and aggregate base (in CM) for rehabilitation projects. Assume 10% of the structural concrete quantity for aggregate base for rehabilitation projects.

Please note, joint seals at the abutment are considered separate pay items.

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Attachments