102.03.04 Tunnels

The minimum design vertical clearance for tunnels shall be at least 6.00 meters for freeways and arterials and at least 5.50 meters for all other highways and streets.

102.03.05 Sign Structures

Because of their lesser resistance to impacts, the minimum design vertical clearance to sign structures shall be 6.00 meters regardless of the highway system classification. An allowance of 150 millimeters is included to accommodate future resurfacing.

102.03.06 Width (AASHTO 2.3.1)

The horizontal clear width for rural bridges where approach guardrail is used shall provide an additional width on each side of the approach roadway width to allow the bridge rail to line up with the approach guardrail. The horizontal clear width for urban bridges, in which curb and gutter and/or sidewalks are used, shall equal the approach roadway width.

102.04 RAILINGS (AASHTO 2.7)

In general, concrete barrier should be used as a vehicular railing. For situations requiring a different barrier type, only FHWA crash test approved bridge rails are allowable alternatives.

Bridge rails shall be constructed vertical. Concrete barriers shall not be slipformed. For cast-in-place, post-tensioned concrete bridges, barriers shall be cast after post-tensioning and may be cast before falsework removal.

102.05 CONCRETE BARRIER TRANSITIONS

Transitions from bridge concrete barrier to approach guardrail should, when practical, be located on the bridge, approach slab or wingwalls.

102.06 APPROACH SLABS

Concrete approach slabs shall be used on all structures. Approach slabs serve a dual purpose of providing a transition structure from the bridge to the approach roadway should the roadway embankment settle and of eliminating the live load surcharge of the abutment backwall when the conditions specified in AASHTO 3.20.4 are satisfied. Approach slabs are to be designed using the Service Load Design Method and shall cover the entire roadway width including the shoulders, from wingwall to wingwall.

102.07 ANCHOR SLABS

When approach roadways are paved with portland cement concrete pavement (PCCP), adequate means shall be provided to prevent pavement growth from causing damage to the bridge. Use of a properly designed anchor slab is one means of providing such protection

102.08 DECK DRAINAGE

On grade separation structures, roadway drains shall not discharge water onto unprotected embankment slopes or within five meters of the traveled roadway below, nor shall drains be located less than 1.5 meters from the centerlines of abutments or piers. In urban areas collection of deck drainage in a pipe system may be required, with down drains in or on pier columns discharging into storm drainage collector systems. Consideration should always be given to provide collector drains and discharge systems on the approach roadway gutter rather than on the bridge.

For bridges with sidewalks, expansion joints shall be turned up at the curb line to prevent roadway water from entering sidewalk areas. Appropriate means shall be taken to ensure that sidewalk drainage does not pond and that the water does not escape around the wing walls and erode the embankment.

For deck drainage design criteria, refer to the ROADWAY DESIGN MANUAL - Drainage.