Section 13
Approach Details

13.1 Approach Slabs

13.1.1 Purpose

Approach slabs provide a smooth transition between the bridge deck and the highway approach. The approach slab helps to reduce the "bump" that can be created when the approach fill settles at the end of the structure.

New York State DOT requires approach slabs to be used on all State-owned bridges except for buried structures. On local bridges the owner is given the option of requesting approach slabs. This resulted from a request by many local authorities to reduce the cost of new bridge projects. Local bridges usually have low volumes of high speed truck traffic, therefore, the need for approach slabs is reduced. Unless specifically requested otherwise, approach slabs are not required on local bridge projects unless the type of structure used demands them, such as integral or jointless.

13.1.2 Length Determination

Approach slab length is determined by taking 1.5 times the height of the abutment, measured from the bottom of footing to top of pavement, and dividing it by the cosine of the skew angle of the abutment. This length is taken along the station line and then rounded to the next higher foot. The maximum approach slab length is limited to 25 ft., while the minimum length is 10 ft. See Section 13.1.4 for length determination with skews greater than 30°.

13.1.3 Width Determination

The width of approach slabs used with conventional abutments and joint systems shall be from the edge of travel lane to edge of travel lane plus 1 ft. on each side. However, if the bridge is on a superelevated roadway where the crown line is at the edge of the travel lane, the approach slab should not extend the 1 ft. beyond the crown line. When the highway approach has curbs, the approach slab shall be placed from curb to curb.

For conventional abutments with U-wingwalls, the distance between the approach slab and the rear face of the U-wingwall should be a minimum of 4 feet to provide sufficient space for placement and compaction of shoulder material. If the 4 foot minimum cannot be provided carry the approach slab to the rear face of the U-wingwall. A 1” gap filled with two sheets of an appropriate bond breaker shall be placed between the approach slab and the face of the U-wingwall to allow the approach slab to move vertically. Past experience shows that a single sheet of bond breaker material is insufficient.
On integral and jointless abutments the approach slab shall typically be full width from face of railing to face of railing when the approaches are straight and flared or in-line wingwalls, are shown. Curved approaches should be dealt with on a case by case basis. Approach slabs shall extend under any sidewalk on integral and jointless abutments. See current approach slab BD sheets for corner details.

U-wingwalls are undesirable on integral abutments and at the expansion end of jointless abutments. If they are used, the minimum gap between the approach slab and the U-wingwall shall be 2” and filled with at least two sheets of Premoulded Resilient Joint Filler, Material Subsection 705-07. Past experience has shown that binding has occurred with smaller gaps damaging both the wall and slab. See Section 5.2 for additional criteria for jointless decks and Section 11.6.1.6 for additional criteria for integral abutments.

13.1.4 Skewed Approach Slabs

For conventional abutments with skews of 30° or less, the end of the approach slab shall be parallel to the skew. For skews greater than 30°, the end of the approach slab should be squared off, and the length of the approach slab is measured along the shorter side at the edge of travel lane.

In cases of wide bridges with large skews, the length of the long edge of the approach becomes excessive. In these cases the end of the approach slab shall be parallel to the skew.

For integral and jointless abutments the end of the slab shall be parallel to the skew for all skew angles.

On curved structures the end of the approach slabs are typically placed radially. To simplify construction, the sides of the approach slabs should be on a chord, rather than on the curve.

If the strict interpretation of the above criteria creates excessively wide or long approach slabs, consideration shall be given to alternative details.

13.1.5 End of Approach Slab Details

When an approach slab meets a concrete approach pavement, a pressure relief joint/sleeper slab is required. When an approach slab with a conventional jointed abutment meets a flexible highway approach pavement, a pressure relief joint/sleeper slab is not required.

For span length requirements of integral abutments, abutments with jointless details and details of sleeper slabs see the BD-SA sheets.

Pressure relief joint and sleeper slab lengths are in addition to the approach slab length calculated in Section 13.1.2.
13.2 Approach Drainage Details

13.2.1 Purpose

Large volumes of water running along the highway approach pavement can result in unacceptable spread of water on bridge superstructures. If the spread encroaches into the travel lane, it can cause dangerous hydroplaning. It is important to redirect water that runs along the highway approach pavement away from the structure and into a controlled channel to prevent erosion. Also, it is important that water that collects on the bridge be redirected into a controlled channel for erosion control. Proper handling of approach drainage will reduce or eliminate the need for scuppers on the bridge. See Section 5.4 for design criteria for bridge deck drainage.

13.2.2 Superstructures with Curbs or Barriers

On the upgrade end of bridges where curbs are used on the approaches a catch basin (CB) located in front of the curb should be provided. It should be located approximately 10 ft. from the end of the bridge wingwall or reinforced concrete approach slab, whichever is farther from the bridge, to collect the highway drainage before it reaches the bridge. Stone curb shall be used between this point and the bridge.

At the ends of all curbed bridges where curbs are not used on the approaches, a stone curb transition section shall be installed as indicated on the appropriate BD sheet. Stone lined gutters shall be provided where required to carry the drainage down the slope of the embankment.

13.2.3 Superstructures without Curbs or Barriers

No special drainage details are required on the structure or highway approach sections.