1. Underdrain. The underdrain will consist of the pay items as follows:

   a. Pipe, Type 4, Circular, *(size)* in.;

   b. Geotextile for Underdrains; and

   c. Aggregate for Underdrains. Only the aggregate placed below the subgrade is included as aggregate for underdrains.

2. Underdrain Outlets. Underdrain outlets will consist of the pay items as follows:

   a. Pipe Underdrain Outlet, *(size)* in.;
   b. Outlet Protector, *(type)* ; and
   c. Delineator Post.

17-4.05 Non-Standard Concrete Median Barrier

A non-standard concrete median barrier may be required on a horizontal curve, superelevation transition, or other locations where the barrier height varies from the standard dimensions, or where the median barrier is attached to a concrete footing or wall cap. Identify these locations on the plans and include the pay items Concrete, Class A and Reinforcing Steel, on the plans. Also, include a special provision in the contract.

A short length of irregular concrete median barrier section used in conjunction with the standard shape, a barrier at an approach to a bridge pier, sign foundation, or other similar support should be considered concrete median barrier and quantified as concrete barrier.

17-4.06 Curb Ramp and Detectable Warning Surface [Rev. Apr. 2016]

The pay limit for a curb ramp should include the ramp, blended transition, turning space, flared side and return curb as required. Where a turning space is shared by more than on curb ramp the turning space should only be measured for payment once.

Quantities for curb or combined curb and gutter within the curb ramp limits should not be included in the curb ramp quantity. These quantities should be incorporated into the project's appropriate curb or curb-and-gutter quantities. Quantities for sidewalk required outside the curb ramp pay limit, should be incorporated into the project concrete sidewalk quantities. If flared

sides are sod instead of concrete, such sodding should be incorporated into the project sodding quantities. The following pay items apply to curb ramps.

1. Curb Ramp, Concrete (SYS). Include the area of the ramp, blended transition, turning space, flared side, and return curb.

2. Detectable Warning Surface (SYS). Include the area of the detectable warning surface for the full width of the ramp, or blended transition, or turning space, as appropriate.

The pay item Detectable Warning Surface, Retrofit, should be included where a detectable warning surface is replaced or placed without construction of a new curb ramp. The pay limits of the detectable warning surface, retrofit should only include the detectable warning surface area. The Detectable Warning Surface, Retrofit pay item will include the removal, disposal, and replacement of portions of the concrete ramp, concrete base, including border, detectable warning surface, thin set mortar, and fine aggregate (where required) for filling joints.

Figure 17-4D, Quantities for Curb Ramp, illustrates the pay limits for curb ramps.

17-4.07 Sodded, Paved, or Riprap Ditch

A longitudinal-ditch slope of flatter than 1% will be seeded. A slope of 1% or steeper but flatter than 3% will require sodding. A slope of 3% or steeper will require a paved side ditch or riprap lining. However, in an area of poor soil, a slope of flatter than 3% may be paved or lined with riprap. A riprap ditch is typically used in a rural area and should be avoided in an urban area. The final ditch-protection type will be determined at the field check in consultation with the district office. The following discusses how to estimate the quantities for each ditch type.

17-4.07(01) Sodded Ditch

A standard sodded ditch is that which is parallel to the pavement profile grade line. A special sodded ditch is that which varies in elevation with respect to the pavement profile grade line. Depending on the side slopes, either ditch type may be used within the clear zone. Do not use a ditch with side slopes of 3:1 or steeper within the clear zone.

A ditch should be sodded to a point 1 ft above the flow line. Figure 17-4E, Sodded Ditch Quantities, provides the factors that can be used to determine the sodding quantities for a 4-ft wide sodded ditch based on various side slopes.