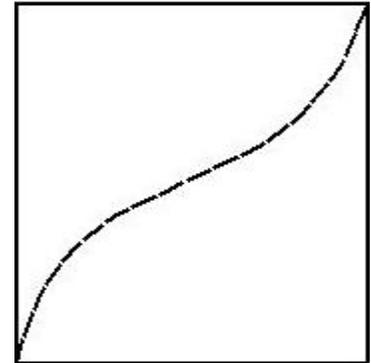


**EC-5 SLOPE DRAINS**

Refer to: ITD Standards and Specifications for Highway Construction, Sections 212 and 706.  
ITD Standard Drawing P-1-A.



**Standard Symbol**

**Definition and Description**

- A slope drain is installed to transport concentrated runoff from the top of a slope to a sediment basin, ditch, or a channel, at the toe of the slope. Water is collected above a disturbed slope (cut or fill) and directed to a collection point at the inlet of the slope drain.
- The use of the slope drain prevents accumulated runoff to flow over slopes that are at high risk of erosion or slope failure. The discharge from the slope drain should be directed into a stabilized water course, riprap, or sediment basin.

**Appropriate Applications**

Slope drains are used primarily during construction whenever runoff needs to be diverted and conveyed down a slope without causing erosion. Slope drains should be used before the slope has been stabilized using a more permanent erosion and sediment control BMP. Slope drain applications may include the following:

- On cut or fill slopes before permanent stormwater drainage structures have been installed.
- Where earth dikes, berms, channels, or ditches have been installed to divert accumulated water from flowing on disturbed slopes.
- On any slope where concentrated runoff crossing the face of the slope may cause gullies, rills, channel erosion, or saturation of slide-prone soils.
- As an outlet for a natural drainage.

BMP Objectives	
<input checked="" type="checkbox"/>	Perimeter Control
<input checked="" type="checkbox"/>	Slope Protection
<input type="checkbox"/>	Borrow and Stockpiles
<input checked="" type="checkbox"/>	Drainage Areas
<input type="checkbox"/>	Sediment Trapping
<input type="checkbox"/>	Stream Protection
<input checked="" type="checkbox"/>	Temporary Stabilizing
<input type="checkbox"/>	Permanent Stabilizing

**Limitations**

The area to be drained through the slope drain should not exceed 10 acres. Site specific design and application will be required.

**Design Parameters**

The drainage system, comprised of the diversion measures, inlet, and drain, should be designed (pipe sizing and spacing) to handle the peak runoff for an appropriate design storm event for the project location.

**Construction Guidelines**

- Install the inlet section of the slope drain at points where water is discharged from ditches, channels, berms, dikes, or other points of concentrated flow.
- Place erosion control geotextiles under the inlet.
- Funnel the flow into the drain. Cross berms and a sediment basin may be needed ahead of the inlet.
- Compact soil around and under the inlet section to the top of the dike or berm to prevent piping failure or undercutting around the inlet.
- Ensure that the finished grade at the inlet is a minimum of 6 inches above the top of the slope drain.
- Place the slope drain on firm, well-compacted soil.
- Anchor all drains to the slope using anchors or stakes to prevent disruption by water or other forces.
- Fasten the slope drain sections securely together and use watertight fittings.
- Extend the pipe beyond the toe of the slope and discharge into a stabilized area or to a sediment basin or pond. Use riprap at the discharge or outlet area to reduce erosion.
- Immediately stabilize the areas disturbed by installation or removal of the slope drain.
- Make field adjustments as necessary to ensure proper performance.

**Maintenance and Inspection**

- Conduct inspections as required by the NPDES permit or contract specifications. Make necessary repairs immediately if function is compromised.
- Keep construction traffic off the slope drain, and do not place any material on it.
- If necessary, install headwalls or sandbags to prevent bypass flow.
- Install additional outlet protection if needed, and immediately repair breaks and clean out any debris.
- Clean the sediment basin, if provided, when the sediment level reaches one-half the design volume, and dispose of properly per NPDES permit requirements.
- Leave the slope drain in place until the slope has been completely stabilized, or replace with a more permanent slope stabilization measure.

- Remove the temporary slope drain when the slope is stabilized.