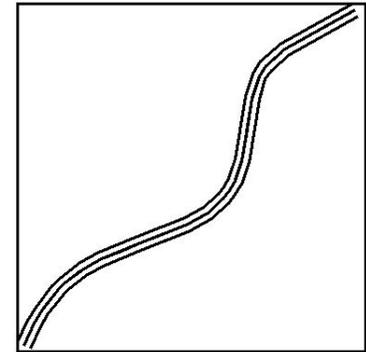


## SC-2 CHECK DAM

Refer to: ITD Standards and Specifications for Highway Construction, Section 212.

ITD Standard Drawing P-1-D & P-2-B.

QPL Category: 212 Sediment Retention Fiber Rolls



Standard Symbol

### Definition and Purpose

Check dams are constructed of rock, sediment retention fiber rolls, gravel bags, sandbags, or other proprietary product placed across a natural or manmade channel or drainage ditch. A properly designed, constructed, and maintained check dam will reduce scour and channel erosion by reducing flow velocity and encouraging sedimentation.

Check dams in conjunction with sediment basins are usually able to capture a large percentage of the sediments suspended in the water.

### Appropriate Applications

A check dam either filters the water for sediment as it passes through the dam or retains the water, allowing the sediment to settle while the water flows over the dam. Check dams may be installed:

- In small open channels.
- During the establishment of grass linings in drainage ditches or channels.
- In temporary ditches where the short length of service does not warrant establishment of erosion-resistant linings.

The following products are available to construct an effective temporary check dam:

- *Rock Check Dams* are constructed primarily of riprap and are more effective in ditches where the velocity of runoff is expected to be high, or in situations where the surface area exceeds 5 acres and drainage is funneled into a ditch or channel. An erosion control geotextile should be used at the bottom or base of the rock check dam to prevent undercutting. In some instances, erosion control geotextile should also be installed on the overflow portion of the dam to prevent erosion.

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

- *Sediment Retention Fiber Roll Check Dams* are made from natural or organic material (e.g. straw, coconut fiber (coir), wood fiber (excelsior) mulch, or compost) wrapped in biodegradable netting. Sediment retention fiber roll can be cut to length and used for ditch or channel protection and are easily installed. A series of stair steps made of fiber rolls is effective in filtering and collecting water. Most fiber rolls are degradable and can be left in place after construction. See SC-8, *Sediment Retention Fiber Rolls*.
- *Sandbag Check Dams* are best suited for emergencies such as floods or slides when other materials may be difficult to acquire. Individual sand bags can be filled and placed to form a check dam where water needs to be diverted or channeled. Tightly abut the bags and stack them using a pyramid approach. Place the bags in an interlocking pattern to assure proper sealing and stability; the upper rows of sandbags shall overlap the joints in lower rows. Bags shall not be stacked higher than 3 feet.
- *Straw Bale Check Dams* should only be used in emergencies and are better suited as a temporary berm or dike to capture or direct runoff where structural strength is not required.
- Temporary check dams should be removed after the purpose is served or when permanent BMPs are in place and final stabilization is achieved, unless directed otherwise.
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### Limitations

- Check dams:
  - Shall be used on slopes with a gradient of 3:1 or less.
  - Shall not be used in live streams, except as allowed with proper approval and permitting.
  - Shall not be placed in channels that are already grass-lined unless erosion is expected, as installation may damage vegetation.
  - Shall not be constructed from silt fence.
  - Require extensive maintenance following high velocity flows.
  - Promote sediment trapping, which can be re-suspended during subsequent storms or removal of the check dam if not properly maintained.
  - Shall be constructed of straw bales only in emergencies.

### Design Parameters

- The size of the area to be drained, the gradient or slope of the ditch and anticipated high velocity runoff must all be considered when choosing the appropriate type of check dam.
- Rock check dams are usually the most effective to use, but the correct rock size and combination must be available and installed properly. Rock size should vary from 1 inch to 8 inches, with 8 inches making up 30 percent or more of the mix.

- Check dams shall be placed at a distance and height to allow small pools to form behind them. The check dams shall be installed approximately 6 feet from the outfall device and at regular intervals based on slope gradient and soil type.
- For installation of multiple check dams, backwater from downstream check dam shall reach the toe of the upstream dam. On steep slopes, typically greater than 3H:1V, the spacing will become so close that consideration should be given to using a slope drain (rock lined or pipe) instead of a check dam (see EC-5, *Slope Drains*).
- The center of the check dam should be 6 to 10 inches lower than the top of the outside edge to form a weir for the overflow. The top of the outside edges should be at least 6 inches lower than the roadway, banks, or back slope to prevent water from flowing onto the roadway or undercutting the banks.
- High flows shall safely flow over the check dam without an increase in upstream flooding or damage to the check dam.
- Undercutting shall always be considered, regardless of the type of check dam being used. For rock check dams, a geotextile shall be placed under the bottom of the dam. For sediment retention fiber rolls, a trench (3 to 5 inches deep) shall be dug to key in the roll. Excavated soil shall be placed on the upstream side of the wattle and compact. The fiber rolls shall be anchored with wood stakes according to manufacturer's recommendations.
- Where grass is used to line ditches, check dams may be removed when grass has matured sufficiently to protect the ditch or swale.
- Rock shall be placed individually by hand or by mechanical means, but should not be dumped to achieve complete ditch or swale coverage.
- Stable inlets and outlets shall be designed and constructed prior to installation of check dams.
- If straw bales are used, the bales shall be placed in a trench backfilled on the upstream side and compacted. Rock 1 to 3 inches shall be placed in the overflow area both upstream and downstream (similar to a rock check dam) to provide additional stability and strength. An overflow shall be formed in the center of straw bale check dams.
- Careful inspection is important during installation of check dams and channel liners. Refer to special contract provisions or plans to ensure that check dams and liners are installed and perform properly during their lifetime.
- Field adjustments shall be made as necessary to ensure proper performance.

### **Qualified Products List Criteria**

See SC-8 (Fiber Rolls).

### **Maintenance and Inspection**

- Conduct inspections as required by the NPDES permit or contract specifications.
- Make any repairs necessary to keep the check dams in good working order and check for signs of undercutting.

- Remove accumulated debris and sediments from behind the check dams when sediment reaches a depth of one-half the original height of the dam and prior to permanent seeding or soil stabilization. Dispose of all materials properly at an approved site.
- For sediment retention fiber rolls, clean out accumulated sediment or replace the roll as necessary.
- Replace rock as necessary to maintain the correct height of rock check dams.
- Replace sandbag dam fabric as necessary.
- Remove check dam when no longer needed or when directed by the Engineer.