

## **BMP 31.00 – 33.00. Temporary Check Dam**

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These instructions include BMP 31.00, 32.00, and 33.00.

### DESIGN CONSIDERATIONS

#### *Objectives*

Temporary Check Dams are used to reduce scour, reduce velocity, dissipate energy, prevent erosion, and settle sediment behind the weir structure in an unlined channel or vegetative swale.

#### *Description*

A Temporary Check Dam can be constructed of a variety of materials and is placed perpendicular to flow in a ditch or channel. It is placed so that it extends higher than the water level on both sides of the flow path and is lower in the center to allow water to flow through a controlled path.

Temporary Check Dams can be constructed from angular rock, fiber rolls, prefabricated foam barriers, sandbags, or compost socks. When rock is used, small sediment particles become lodged in the check dam's interior.

#### *Other Names*

In-Stream/Channel Energy Dissipater, Velocity Control Device, Sediment Trap, Ditch Check

#### *Applicability*

Temporary Check Dams are placed in series in ditches, swales, or other minor drainageways that require velocity checks, are not yet vegetated, or are intended to be filled or stabilized at a later time. When placed in a lined channel, check dams dissipate velocity, settle sediment, and anchor the liner.

Check dams may also be used as permanent measures for gradient control structures in ditches adjacent to elevated roadway sections.

#### *Selection Considerations*

Dependent on materials available, best management practices (BMPs) being used on the project and the durability required, Temporary Check Dams can be constructed from rock, fiber rolls, prefabricated barrier systems, sandbags, or compost socks. The Standard Drawing for Temporary Check Dams has details for the installation of each type of check dam.

- Check dams are used in narrow ditches.
- Steep channel slopes reduce effectiveness.
- Coupling check dams with a small adjacent upstream sump improves velocity slowing and sediment trapping ability.
- The area downstream from the last dam should be stabilized or flow diverted.
- Check dam rocks interfere with the establishment of vegetation.
- Some Temporary Check Dams are left as a permanent control measure. Removal may be indicated because of unsightliness or interference with maintenance (grass mowing) activities.

#### *Design*

The design of Temporary Check Dams (high at channel banks, lower in the middle) directs overtopping flows centrally to avert scouring of channel surfaces. The check dam is keyed into channel slopes to prevent bank undercut and erosion.

Check dam structures are sized to stay in place during peak flow. The check dam height or weir depth should pass 2-year, 24-hour storm runoff without overtopping the roadway or ditch sideslopes. Generally, check dams are not constructed higher than recommended since excessive weir depth seriously impacts the flow characteristics of the ditch.

- Design flow: 2-year, 24-hour
- Spacing:
  - Align the base of the upstream check dam with the top of the next downstream check dam.
  - Space check dams evenly in the drainageway, adjust spacing for grade breaks.
  - Use the spacing chart below to determine the distance between check dams based on slope and check dam height.

Maximum Spacing for Temporary Check Dams (Feet)

Ditch Grade	Minimum Weir Depth	
	12 inches	18 inches
6%	15	25
5%	20	30
4%	25	40
3%	30	50
2%	50	80

This table is used to estimate the number of check dams. Actual spacing should be based on field conditions and meet the requirement that the top elevation is equal to the bottom elevation of the next upstream check dam. Spacing is also a function of the ditch erodibility, the flow, and the velocity.

*Relationship to Other Erosion and Sediment Control Measures*

Temporary Check Dams are used for channel protection prior to establishment of permanent or stabilized erosion controls. Although check dams perform some sediment filtering, they are not intended to replace filters or sediment basins. A depression in the bottom of the channel at the upstream edge of a check dam augments velocity slowing and sediment removal; however, digging a sump through stabilized in-channel protection (e.g. grassed lining) should be avoided.

Protective channel linings (e.g. grassed waterway, concrete or rock-lined ditch, erosion control blankets, or matings), sediment settling ponds, permanent ditch blocks, brush barriers, diversions, slope drains, or combinations of these measures can be used in conjunction with or as an alternative to Temporary Check Dams.

*Common Failures or Misuses*

- Improper spacing of check dams.
- Undercut/washout of channel banks beside the structure due to improper installation (e.g. dam not built high enough onto the banks).
- Increased bank erosion (e.g. at channel bends) or inadequate protection of channel surfaces due to improper location or installation of check dams.

- Water backup and bank overflow due to overly tall dam structure.
- Use of check dams for soil stabilization.
- Placement of check dams at abrupt bends causing erosive waters to be misdirected by the check dam into channel banks.
- Check dams installed in grass-lined structures may kill the vegetative lining if siltation is excessive or the check dam remains submerged for extended periods of time.
- Placement in waters of the U.S. or wetlands without appropriate agency permitting.
- Placement of check dams below the expected backwater from a salmonid bearing water causing a loss of high flow refuge habitat for overwintering juvenile salmonids and emergent fry.
- Improperly anchored check dams causing the check dam to wash away.
- When rock is used, inadequate rock size or angularity.
- When rock is used, rocks washed downstream causing culvert clogs, misdirecting flow, etc.
- Use of silt fence or straw bales as check dams.

SPECIFICATIONS

Standard Specification

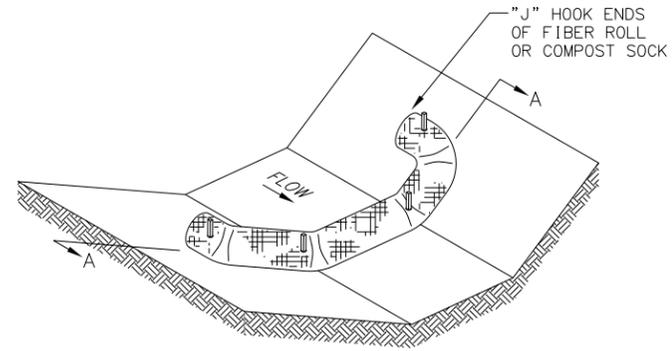
- 685- Temporary Check Dam

Drawings

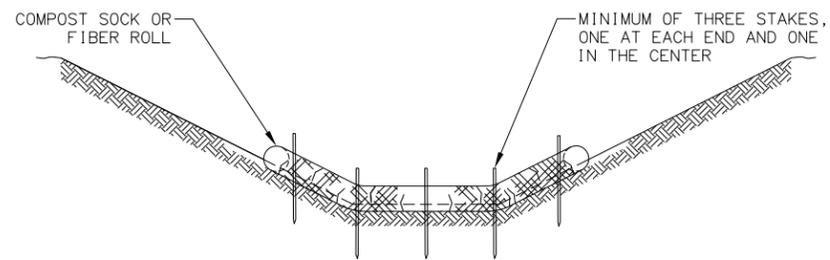
- BMP-31.00 Temporary Check Dam (Notes & Fiber Roll or Compost Sock)
- BMP-32.00 Temporary Check Dam (Prefabricated Barrier System & Rock)
- BMP-33.00 Temporary Check Dam (Sandbag)

Reference Drawings

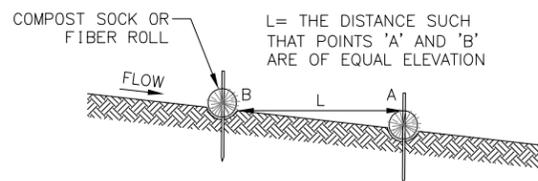
- BMP-04.00 Compost Berm
- BMP-05.00 Compost Sock
- BMP-10.00 Fiber Rolls for Erosion and Sediment Control
- BMP-13.00 Prefabricated Barrier System



PERSPECTIVE



SECTION A-A



PROFILE

FIBER ROLL OR COMPOST SOCK  
NOT TO SCALE

FIBER ROLL OR COMPOST SOCK NOTES:

1. FOR USE OF FIBER ROLLS SEE BMP-10.00 FIBER ROLLS FOR EROSION AND SEDIMENT CONTROL.
2. FOR USE OF COMPOST SOCKS SEE BMP-05.00 COMPOST BERM & SOCK.

INSTALLATION, INSPECTION, MAINTENANCE, AND REMOVAL

1. SEE TEMPORARY CHECK DAM NOTES, THIS SHEET.

TEMPORARY CHECK DAM GENERAL NOTES:

MATERIALS

TEMPORARY CHECK DAM: USE ONLY CLEAN MATERIALS.

INSTALLATION

1. INSTALL CHECK DAMS AS SOON AS DRAINAGE ROUTES ARE ESTABLISHED.
2. PLACE CHECK DAMS PERPENDICULAR TO THE FLOW OF WATER.
3. IF NECESSARY, IMPOUND OR BYPASS UPSTREAM WATER FLOW PRIOR TO INSTALLING CHECK DAMS.
4. EXTEND CHECK DAMS ONTO THE CHANNEL BANKS TO A HEIGHT ABOVE ANTICIPATED HIGH WATER LEVEL TO PREVENT LOCALIZED UNDERMINING AND EROSION.

INSPECTION

1. VISUALLY COMPARE UPSTREAM AND DOWNSTREAM FLOWS TO DETERMINE RELATIVE TURBIDITY LEVELS AND EFFECTIVENESS OF CHECK DAMS.
2. INSPECT CHANNEL BANKS FOR EVIDENCE OF UNDERMINING AND EROSION.
3. INSPECT FOR DAM DETERIORATION AND FOR MIGRATION OF STRUCTURAL COMPONENTS DOWNSTREAM.
4. ENSURE THE CENTER OF THE DAM IS LOWER THAN THE EDGES AND THAT WATER IS NOT RUNNING AROUND THE ENDS.

MAINTENANCE

1. REPAIR BANK UNDERCUTS.
2. REMOVE ACCUMULATED SEDIMENT BEFORE IT REACHES HALF THE HEIGHT OF THE DAM OR ONE-THIRD OF THE AVAILABLE STORAGE IF PROTECTING A WATER BODY OR STORM DRAIN INLET.
3. REPAIR UNDERCUTTING AND FLOW AROUND THE EDGES OR, IF NECESSARY, REPOSITION THE CHECK DAM.
4. INSTALL ADDITIONAL DAMS OR OTHER EROSION AND SEDIMENT CONTROL MEASURES AS NEEDED.

REMOVAL

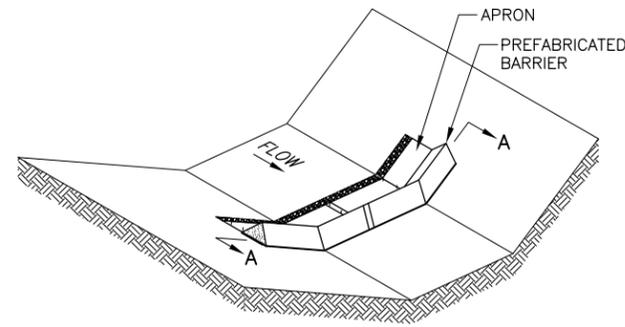
1. AFTER THE DISTURBED AREA IS PERMANENTLY STABILIZED OR WHEN THE GRASS IN THE CHANNEL HAS MATURED SUFFICIENTLY TO PROTECT THE DITCH OR SWALE, REMOVE TEMPORARY CHECK DAMS.
2. TAKE CARE DURING CHECK DAM REMOVAL, SINCE THE WATERWAY SURFACE IS SUSCEPTIBLE TO DAMAGE.
3. IMMEDIATELY SEED OR PROVIDE OTHER FORMS OF PROTECTION FOR DAMAGED OR UNPROTECTED AREAS.

REVISIONS		
Date	Description	By

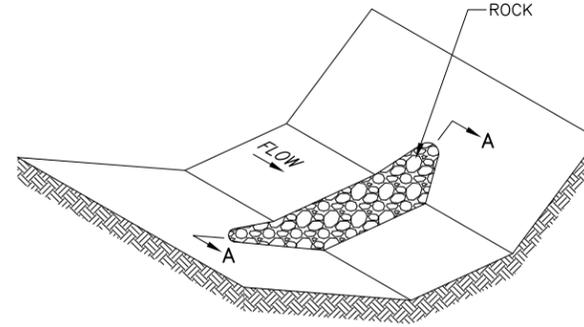
State of Alaska DOT&PF  
**TEMPORARY CHECK DAM**  
**(NOTES & FIBER ROLL OR**  
**COMPOST SOCK)**

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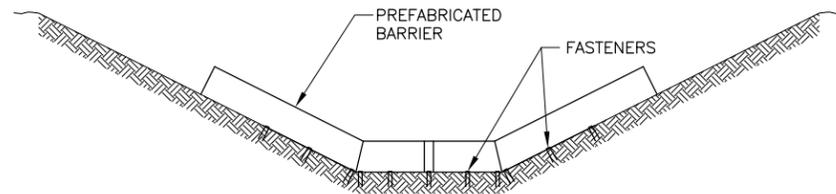
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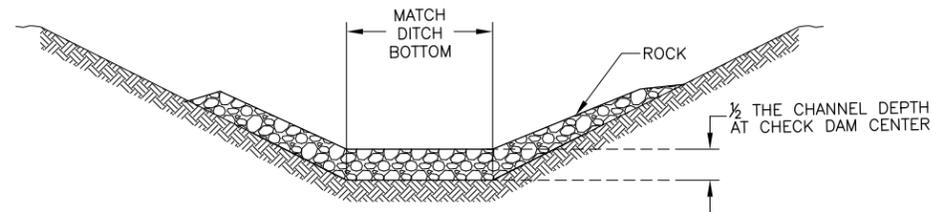
PERSPECTIVE



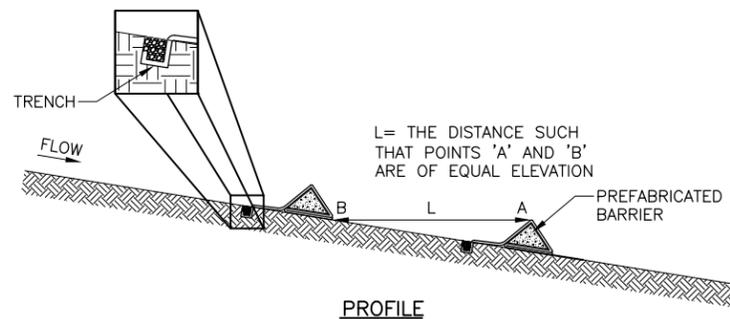
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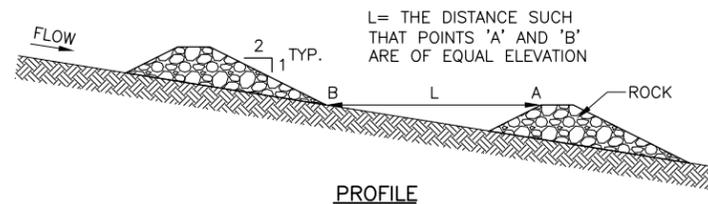
SECTION A-A



SECTION A-A



PROFILE



PROFILE

**PREFABRICATED BARRIER SYSTEM CHECK DAM**  
NOT TO SCALE

**PREFABRICATED BARRIER SYSTEM NOTES:**

- FOR USE OF PREFABRICATED BARRIER, SEE BMP-13.00 PREFABRICATED BARRIER SYSTEM

**INSTALLATION, INSPECTION, MAINTENANCE, AND REMOVAL**

- SEE TEMPORARY CHECK DAM GENERAL NOTES ON BMP-31.00 (TEMPORARY CHECK DAM SHEET 1) - NOTES FOR INSTALLATION, INSPECTION, MAINTENANCE, AND REMOVAL.

**ROCK CHECK DAM**  
NOT TO SCALE

**ROCK NOTES:**  
**MATERIALS**

BERM: CLEAN HARD ANGULAR (E.G. CRUSHED, SHOT) ROCK GRADED ACCORDING TO EXPECTED FLOWS; 3- TO 6-INCH DIAMETER ROCK IS USUALLY ADEQUATE.

**INSTALLATION**

- PLACE ROCK BY HAND OR MECHANICAL MEANS, DISTRIBUTING SMALLER ROCKS TO THE UPSTREAM SIDE TO PREVENT TRANSPORT.

**MAINTENANCE**

- REPAIR VOIDS.
- FORTIFY DISINTEGRATING DAMS. CONSIDER WHETHER ROCK SIZE IS SUFFICIENT FOR FLOWS.
- CORRECT EFFECTS OF ROCK MIGRATION (E.G. CLOGGED CULVERT, FLOW CONSTRICTION) OR ANY DOWNSTREAM EROSION. IDENTIFY THE ORIGIN OF THE PROBLEM AND REPAIR, REPLACE OR ADD BMPS TO CORRECT IT.

**ADDITIONAL NOTES**

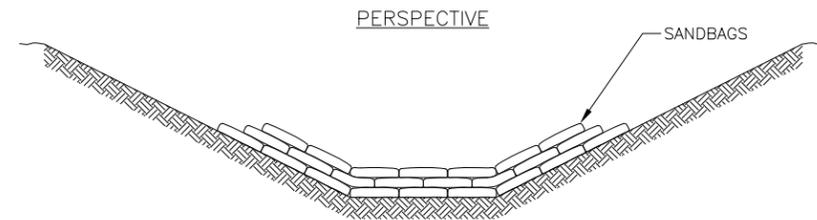
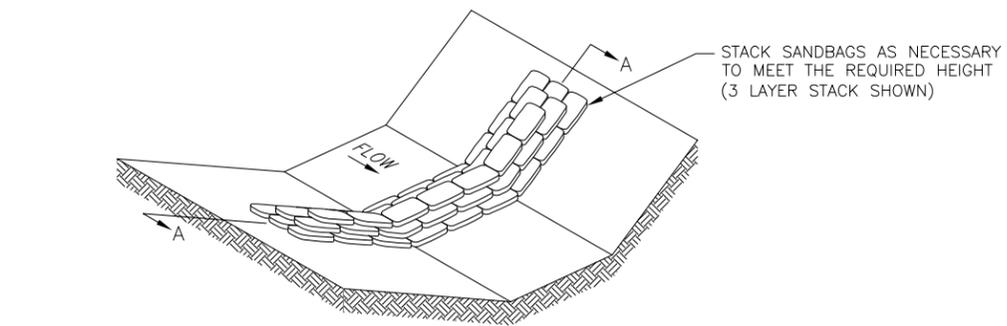
- SEE TEMPORARY CHECK DAM GENERAL NOTES ON BMP-31.00 (TEMPORARY CHECK DAM SHEET 1) - NOTES FOR INSTALLATION, INSPECTION, MAINTENANCE, AND REMOVAL.

REVISIONS		
Date	Description	By

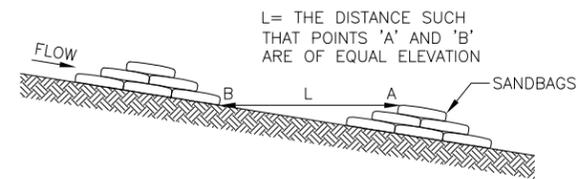
State of Alaska DOT&PF  
**TEMPORARY CHECK DAM**  
**(PREFABRICATED BARRIER**  
**SYSTEM & ROCK)**

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SECTION A-A



PROFILE

SANDBAG CHECK DAM  
NOT TO SCALE

**SANDBAG NOTES:**

**MATERIALS**

**SANDBAG BARRIER:** TIGHTLY WOVEN BURLAP OR WOVEN GEOTEXTILE BAG MATERIAL THAT IS SUFFICIENTLY DURABLE TO REMAIN INTACT FOR THE TIME INTENDED. FILL BAGS  $\frac{3}{4}$  FULL OF GRAVEL OR SAND WITH A GRADATION SUCH THAT NO FINE SEDIMENT PASSES THROUGH THE BAG. IF THE SANDBAGS ARE NEEDED FOR MORE THAN ONE SUMMER SEASON, PROVIDE BAG MATERIAL THAT HAS ULTRAVIOLET STABILITY OF AT LEAST 70% IN CONFORMANCE WITH ASTM D4355 REQUIREMENTS. SECURELY CLOSE THE SAND BAGS.

**INSTALLATION**

1. PLACE SANDBAGS SO THAT THE INITIAL ROW MAKES TIGHT CONTACT WITH THE DITCH LINE FOR THE LENGTH OF THE DAM.
2. TIGHTLY ABUT ALL SANDBAGS.
3. STAGGER SANDBAG LIFTS SO THAT THE CENTER OF THE BAG IS PLACED ON THE SPACE BETWEEN BAGS ON THE PREVIOUS LIFT.

**INSPECTION**

1. ENSURE THE SANDBAGS ARE IN TIGHT CONTACT WITH THE SOIL.
2. LOOK FOR SPLIT, TORN, OR UNRAVELING BAGS.

**MAINTENANCE**

1. REPLACE DAMAGED SANDBAGS AS NECESSARY.

**ADDITIONAL NOTES**

1. SEE TEMPORARY CHECK DAM GENERAL NOTES ON BMP-31.00 (TEMPORARY CHECK DAM SHEET 1) – NOTES FOR INSTALLATION, INSPECTION, MAINTENANCE, AND REMOVAL.

REVISIONS		
Date	Description	By

State of Alaska DOT&PF  
**TEMPORARY CHECK DAM  
(SANDBAG)**

Date 12/2015  

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