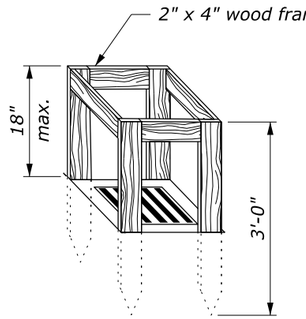
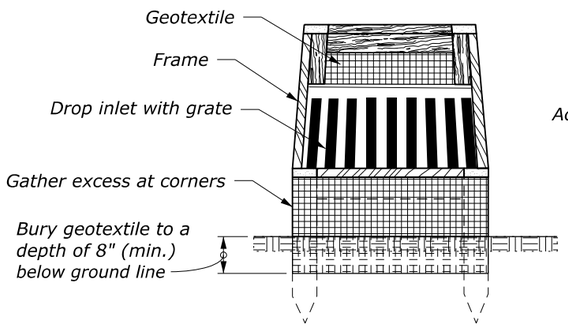
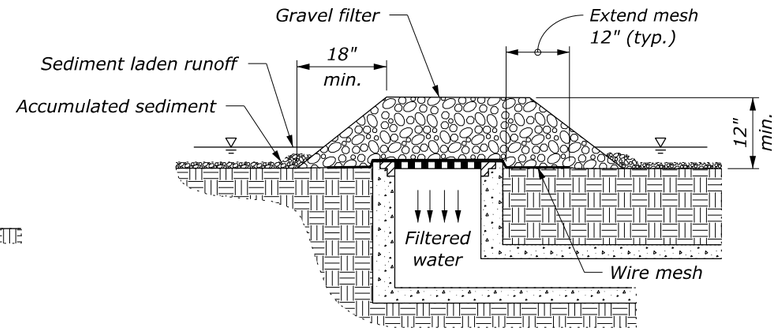
PROJECT	SHEET NUMBER





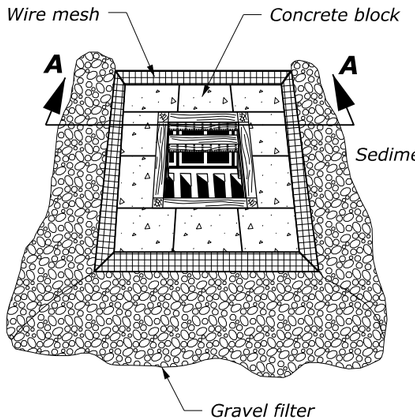
SILT FENCE DROP INLET PROTECTION (TYPE A)

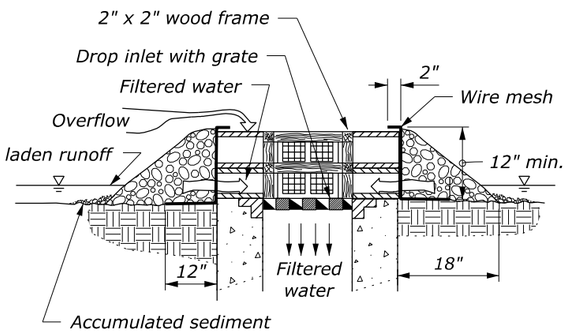


GRAVEL AND WIRE MESH DROP INLET PROTECTION (TYPE B)

NOTE:

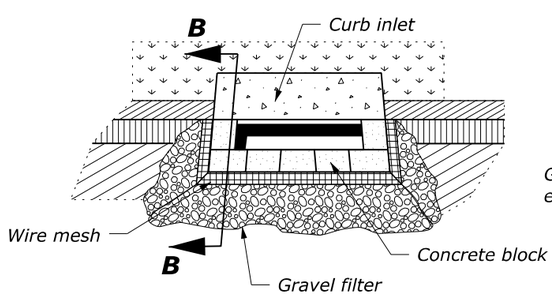
1. For gravel filters use 2" to 3" diameter coarse aggregate.
2. Use wire mesh with ½" x ½" openings.
3. Use type A inlet protection in sump locations only.
4. Use type B inlet protection only in sump locations where heavy concentrated flows are not expected. Do not use where ponding around the structure might cause inconvenience or damage.

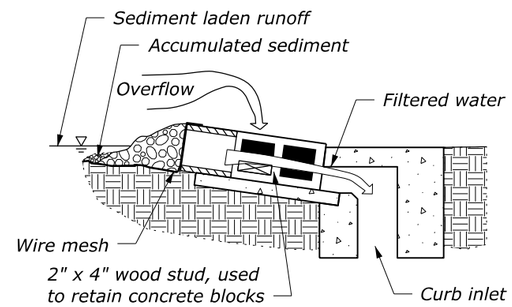




SECTION A-A

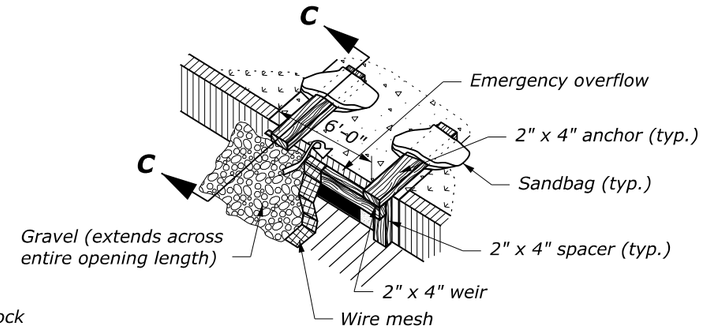
BLOCK AND GRAVEL DROP INLET PROTECTION (TYPE C)

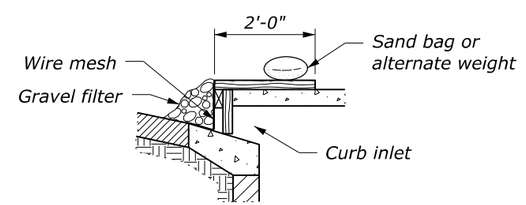




SECTION B-B

CURB INLET PROTECTION, BLOCK AND GRAVEL (TYPE D)





SECTION C-C

CURB INLET PROTECTION, WOODEN WEIR (TYPE E)

NO SCALE

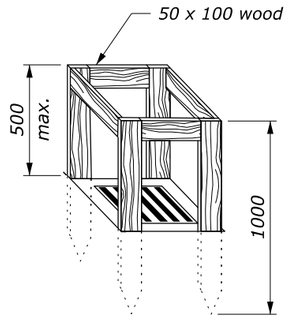
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
OFFICE OF FEDERAL LANDS HIGHWAY

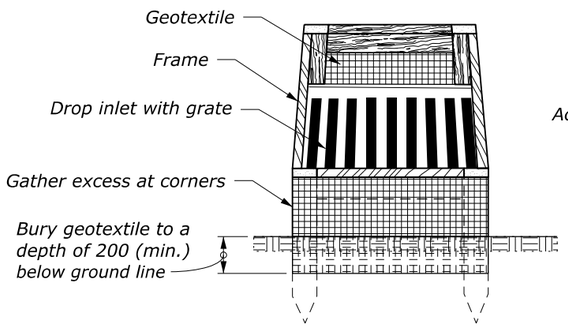
FLH STANDARD

TEMPORARY INLET PROTECTION

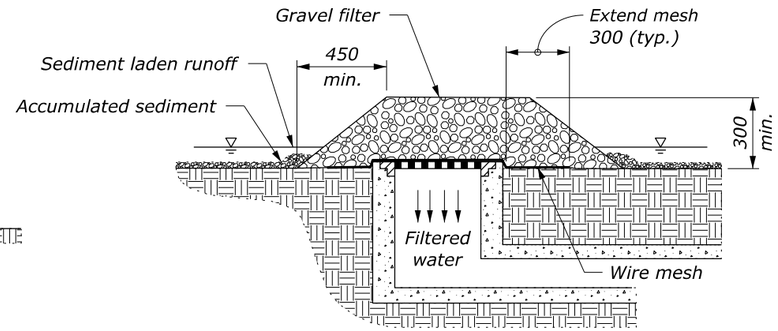
STANDARD APPROVED FOR USE 6/2005	STANDARD
REVISED: 7/2022	157-2

PROJECT	SHEET NUMBER





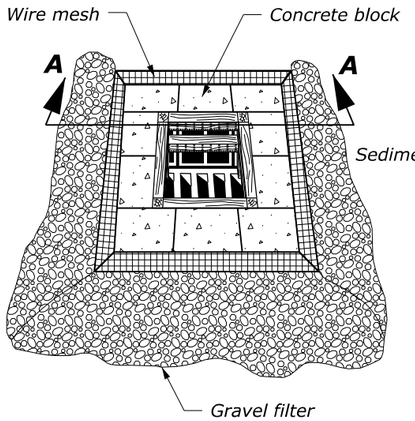
SILT FENCE DROP INLET PROTECTION (TYPE A)

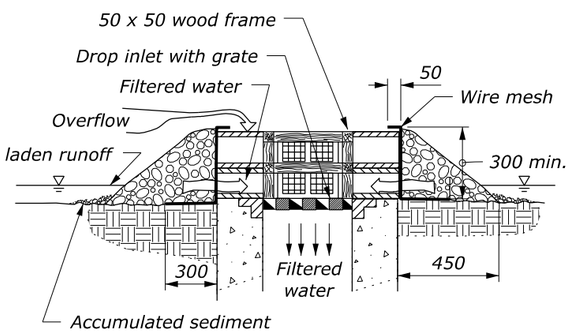


GRAVEL AND WIRE MESH DROP INLET PROTECTION (TYPE B)

NOTE:

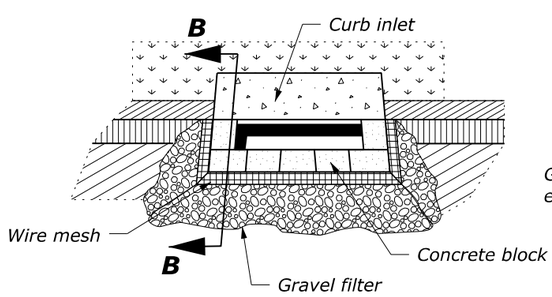
1. *For gravel filters use 50 to 75 mm diameter coarse aggregate.*
2. *Use wire mesh with 12 x 12 mm openings.*
3. *Use type A inlet protection in sump locations only.*
4. *Use type B inlet protection only in sump locations where heavy concentrated flows are not expected. Do not use where ponding around the structure might cause inconvenience or damage.*
5. *Dimensions without units are millimeters.*

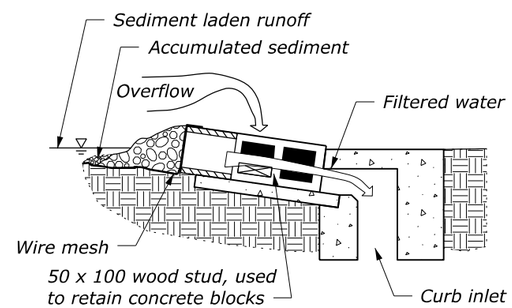




SECTION A-A

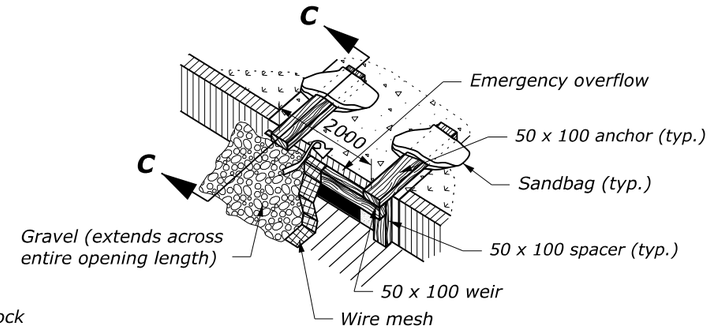
BLOCK AND GRAVEL DROP INLET PROTECTION (TYPE C)

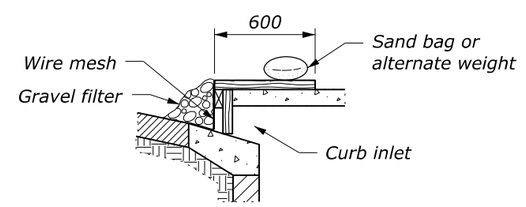




SECTION B-B

CURB INLET PROTECTION, BLOCK AND GRAVEL (TYPE D)





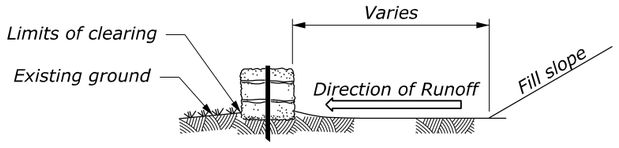
SECTION C-C

CURB INLET PROTECTION, WOODEN WEIR (TYPE E)

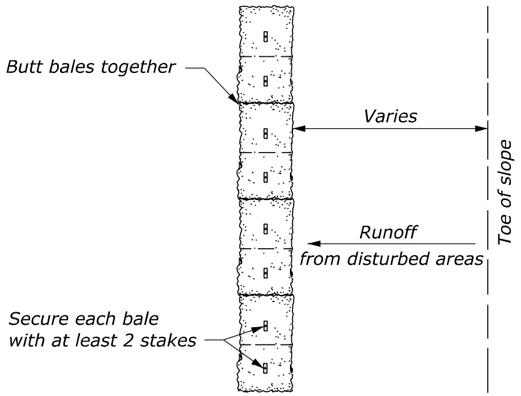
NO SCALE

U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION OFFICE OF FEDERAL LANDS HIGHWAY	
METRIC FLH STANDARD	
TEMPORARY INLET PROTECTION	
STANDARD APPROVED FOR USE 3/1996 REVISED: 6/2005 7/2022	STANDARD M157-2

PROJECT	SHEET NUMBER

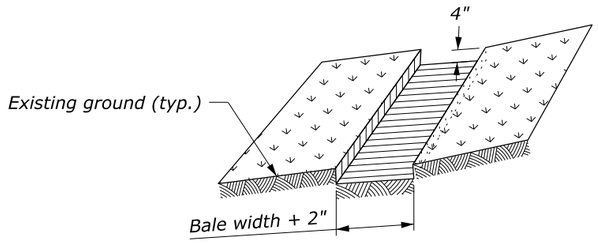


ELEVATION

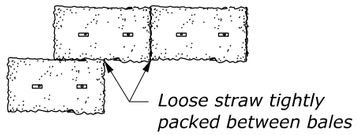


PLAN

INSTALLATION OF A STRAW BALE BARRIER AT TOE OF FILL



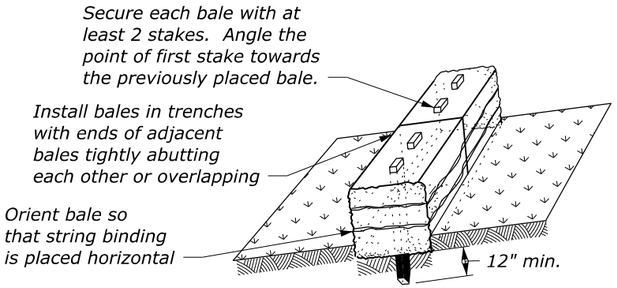
Step 1: Excavate trench



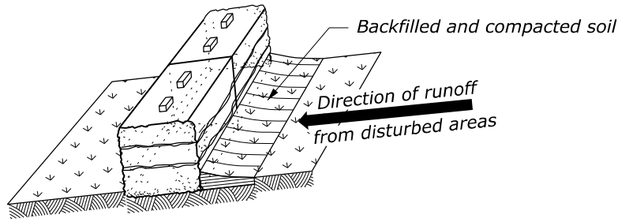
Step 3: Tightly pack straw between bales (plan view of bales)

NOTE:

1. Use straw bales in drainage ditches only for low flow conditions and when specified on the Erosion Control Plans.

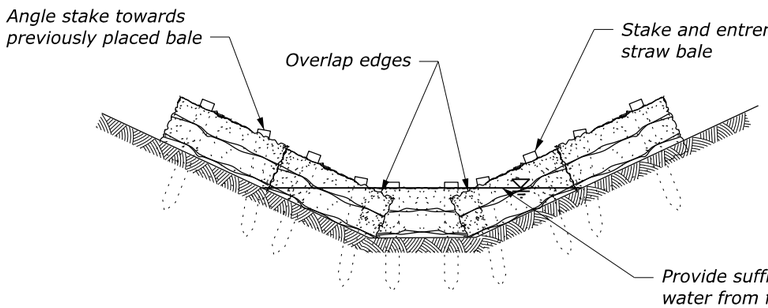


Step 2: Install bales

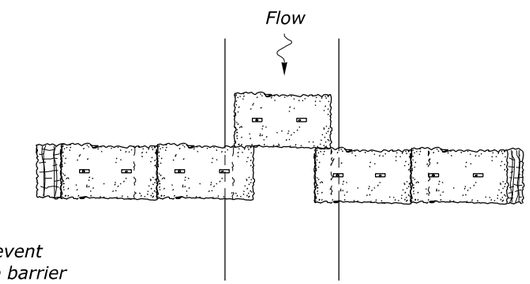


Step 4: Backfill soil against bales

PROPERLY STAKED AND ENTRENCHED STRAW BALES



ELEVATION



PLAN

INSTALLATION OF A STRAW BALE BARRIER IN DITCH

See Note 1

NO SCALE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
OFFICE OF FEDERAL LANDS HIGHWAY

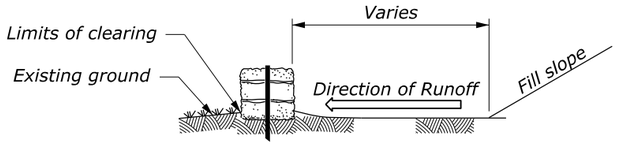
FLH STANDARD

STRAW BALES

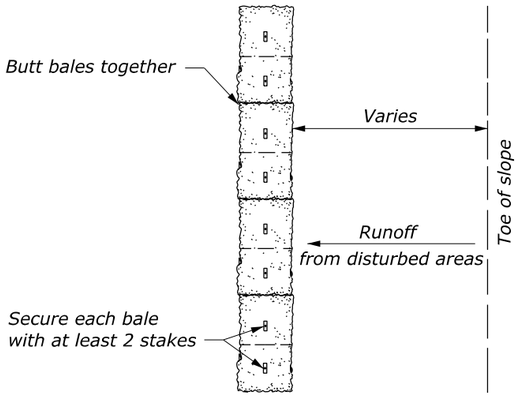
STANDARD APPROVED FOR USE 6/2005
REVISED: 6/2007

STANDARD
157-3

PROJECT	SHEET NUMBER

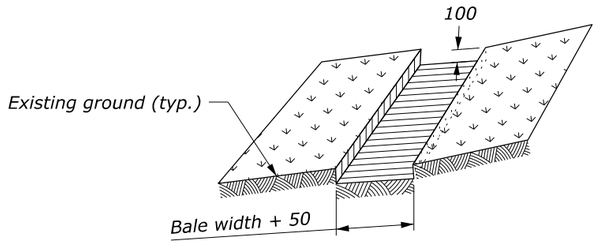


ELEVATION

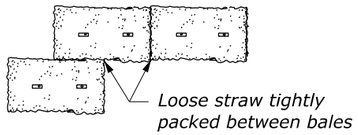


PLAN

INSTALLATION OF A STRAW BALE BARRIER AT TOE OF FILL



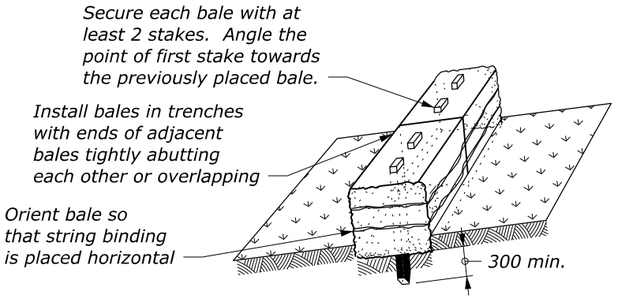
Step 1: Excavate trench



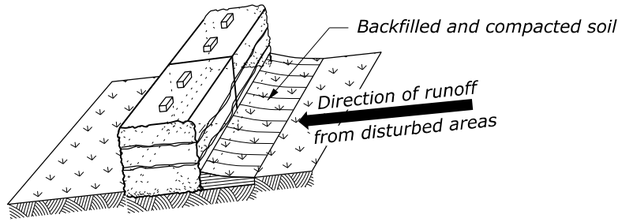
Step 3: Tightly pack straw between bales (plan view of bales)

NOTE:

1. Use straw bales in drainage ditches only for low flow conditions and when specified on the Erosion Control Plans.
2. Dimensions without units are millimeters.

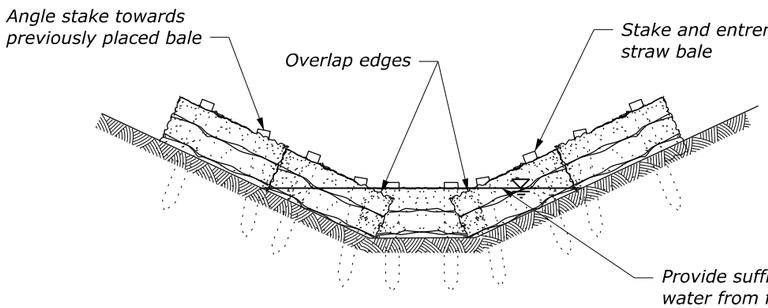


Step 2: Install bales

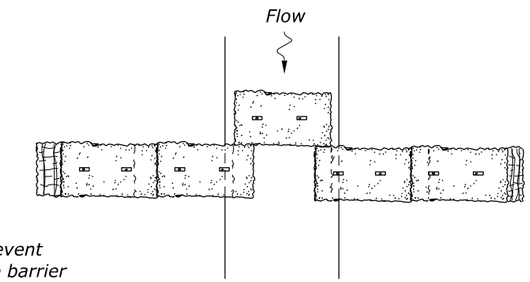


Step 4: Backfill soil against bales

PROPERLY STAKED AND ENTRENCHED STRAW BALES



ELEVATION



PLAN

INSTALLATION OF A STRAW BALE BARRIER IN DITCH

See Note 1

NO SCALE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
OFFICE OF FEDERAL LANDS HIGHWAY

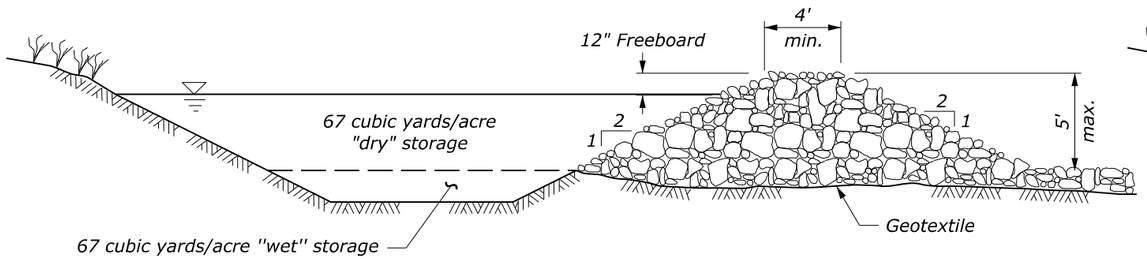
METRIC FLH STANDARD

STRAW BALES

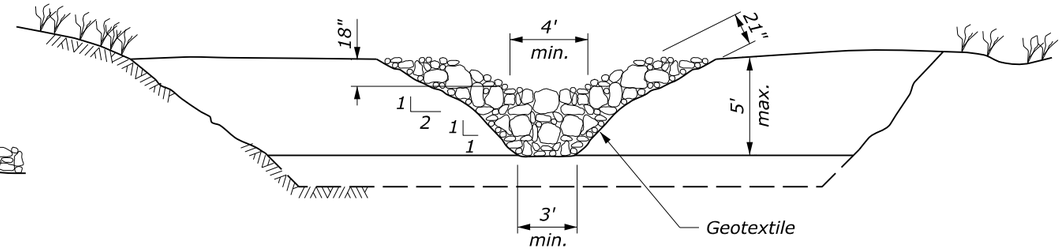
STANDARD APPROVED FOR USE 3/1996
REVISED: 6/2005 6/2007

STANDARD
M157-3

PROJECT	SHEET NUMBER

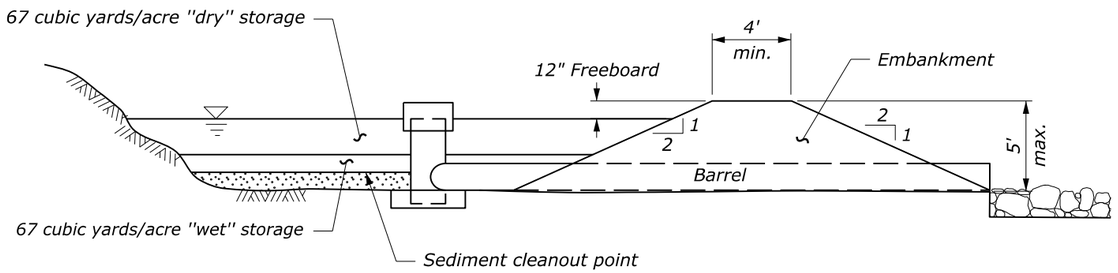


CROSS SECTION THROUGH SPILLWAY



ELEVATION

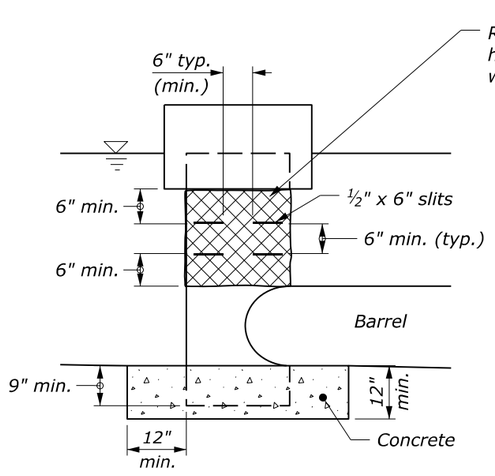
SEDIMENT TRAP (TYPE A) RIPRAP OUTLET



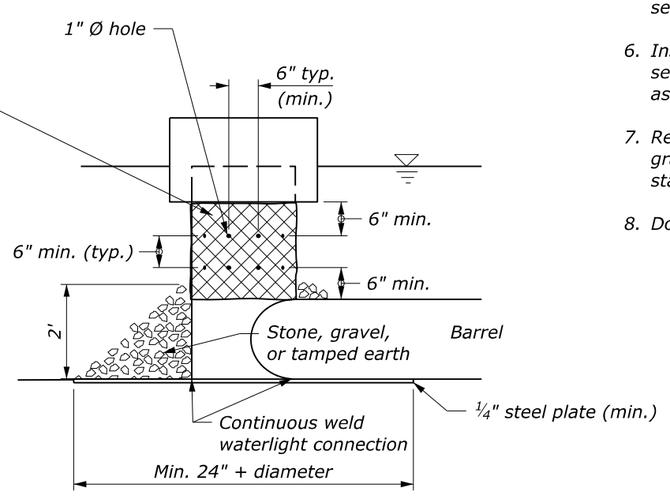
CROSS SECTION

NOTE:

1. Clear, grub, and remove all vegetative matter including root mat before constructing Sediment Trap.
2. Remove vegetative matter, other organic material, and large stones from embankment fill material.
3. Compact embankment in 8-inch layers using construction equipment for compaction of each layer.
4. Seed the soil embankment and all cut slopes with temporary or permanent vegetation within 7 days of construction.
5. Remove sediment from Sediment Trap when accumulated sediment reaches half the design water storage of the trap.
6. Inspect Sediment Trap regularly for damage and accumulated sediment and especially after each storm event. Make repairs as required.
7. Remove the Sediment Trap and stabilize the location by grading and seeding when the upslope drainage area has been stabilized against erosion.
8. Do not use sediment traps for drainage areas over 5 acres.



CONCRETE BASE
WITH SLIT PERFORATIONS IN RISER



STEEL PLATE BASE
WITH HOLE PERFORATIONS IN RISER

SEDIMENT TRAP (TYPE B) PIPE OUTLET

NO SCALE

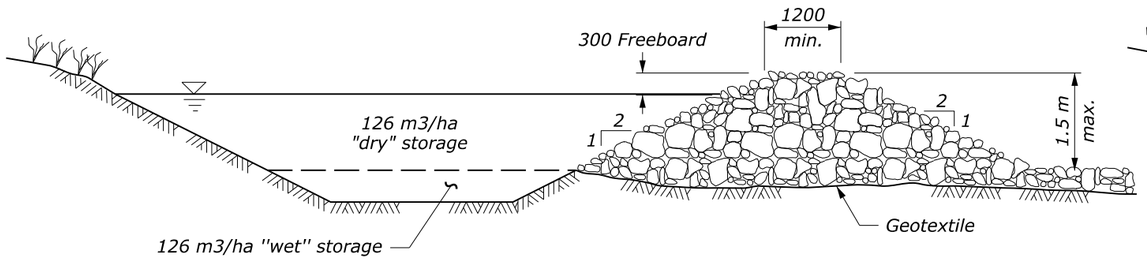
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
OFFICE OF FEDERAL LANDS HIGHWAY

FLH STANDARD

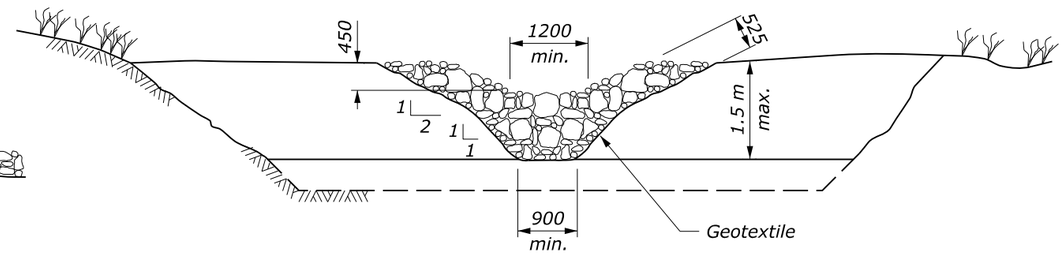
SEDIMENT TRAP

STANDARD APPROVED FOR USE 6/2005	STANDARD
REVISED:	157-4

PROJECT	SHEET NUMBER

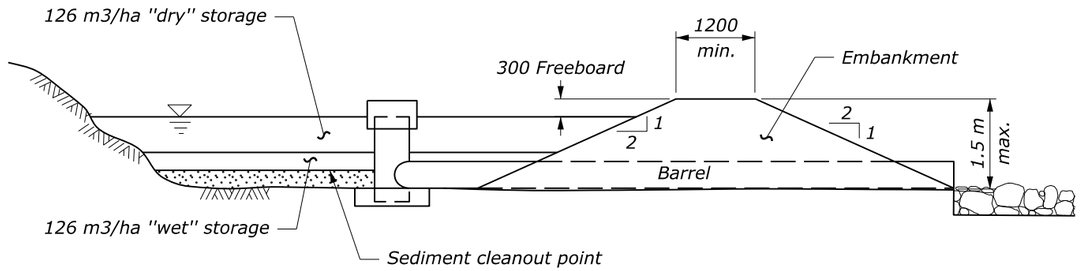


CROSS SECTION THROUGH SPILLWAY



ELEVATION

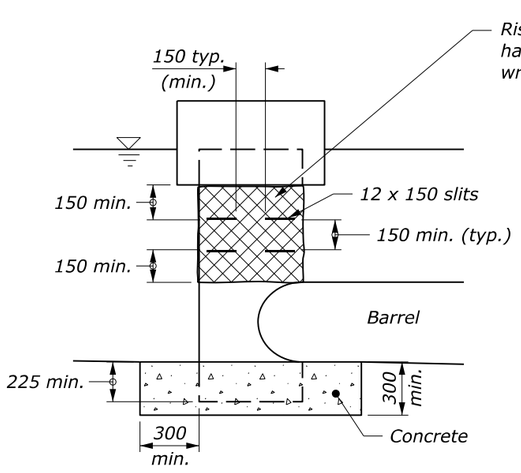
SEDIMENT TRAP (TYPE A) RIPRAP OUTLET



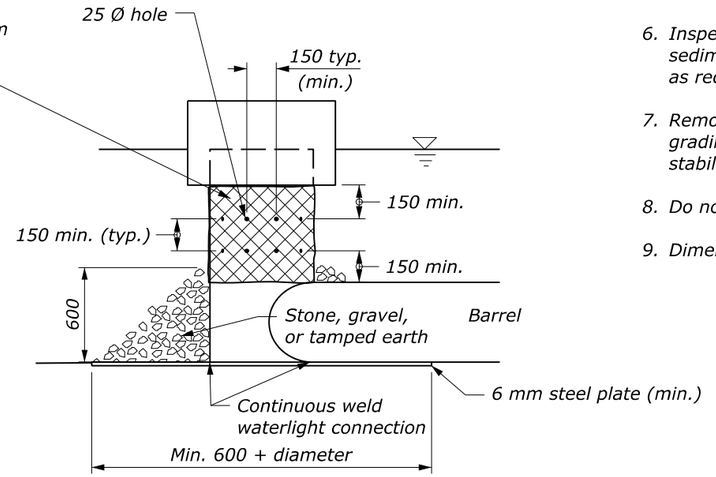
CROSS SECTION

NOTE:

1. Clear, grub, and remove all vegetative matter including root mat before constructing Sediment Trap.
2. Remove vegetative matter, other organic material, and large stones from embankment fill material.
3. Compact embankment in 200 mm layers using construction equipment for compaction of each layer.
4. Seed the soil embankment and all cut slopes with temporary or permanent vegetation within 7 days of construction.
5. Remove sediment from Sediment Trap when accumulated sediment reaches half the design water storage of the trap.
6. Inspect Sediment Trap regularly for damage and accumulated sediment and especially after each storm event. Make repairs as required.
7. Remove the Sediment Trap and stabilize the location by grading and seeding when the upslope drainage area has been stabilized against erosion.
8. Do not use sediment traps for drainage areas over 2 hectares.
9. Dimensions without units are millimeters.



CONCRETE BASE
WITH SLIT PERFORATIONS IN RISER



STEEL PLATE BASE
WITH HOLE PERFORATIONS IN RISER

SEDIMENT TRAP (TYPE B) PIPE OUTLET

NO SCALE

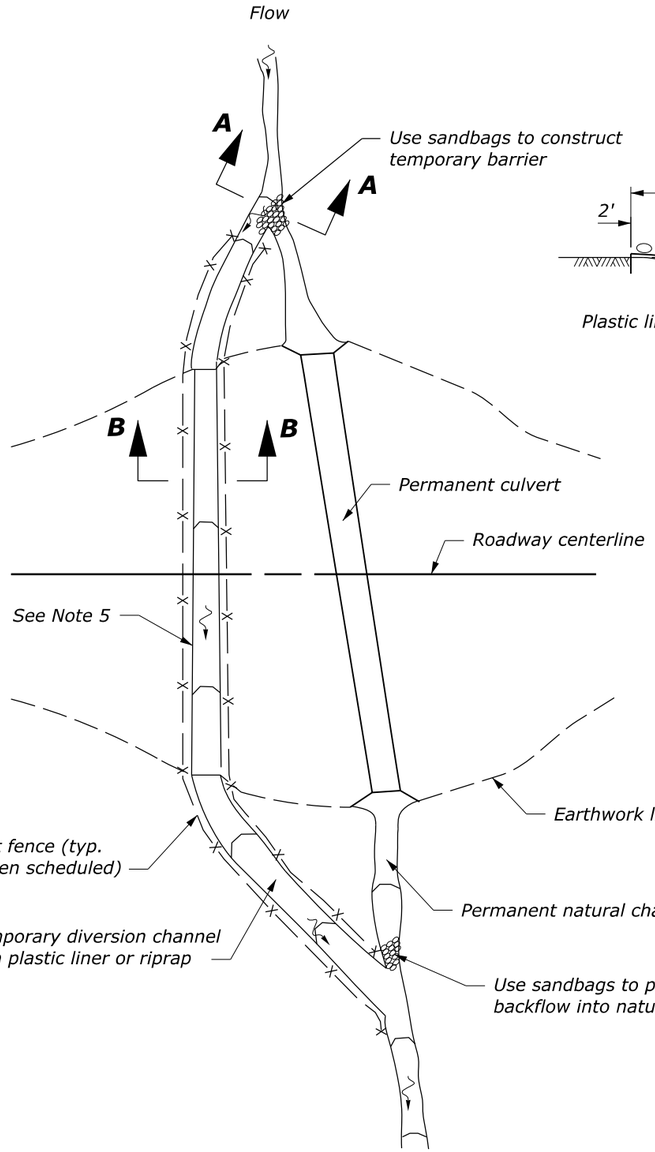
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
OFFICE OF FEDERAL LANDS HIGHWAY

METRIC FLH STANDARD

SEDIMENT TRAP

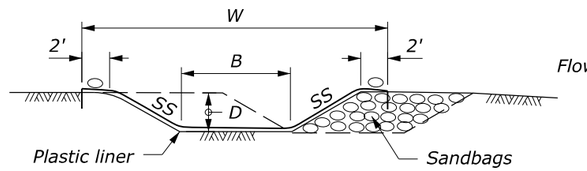
STANDARD APPROVED FOR USE 6/2005	STANDARD
REVISED:	M157-4

PROJECT	SHEET NUMBER

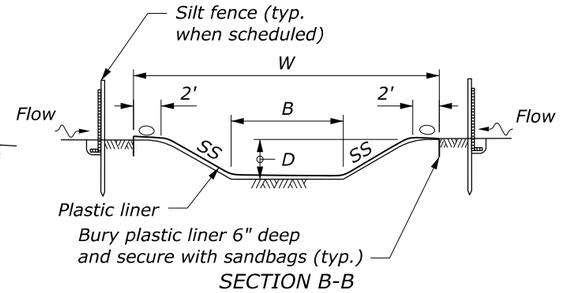


PLAN

DIVERSION CHANNEL

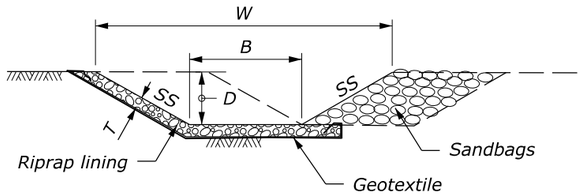


SECTION A-A

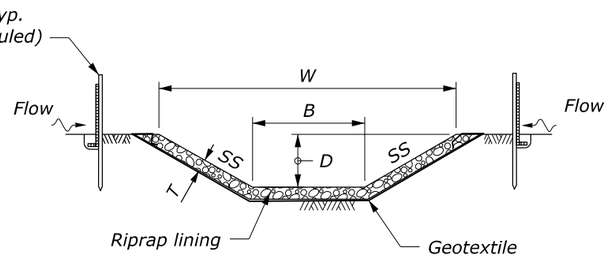


SECTION B-B

PLASTIC LINED DIVERSION CHANNEL

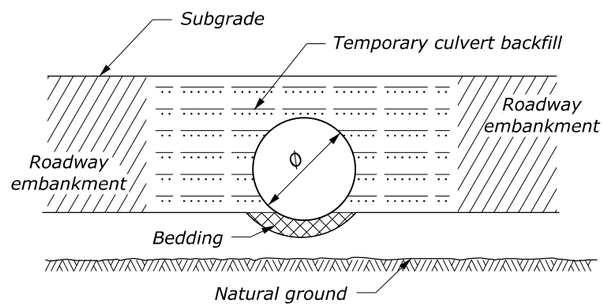


SECTION A-A



SECTION B-B

RIPRAP LINED DIVERSION CHANNEL



SECTION B-B

TEMPORARY CULVERT

NOTE:

1. See Erosion Control Section for temporary culvert diameter, riprap class, channel dimensions and quantities.
2. Use plastic liner or riprap along the entire length and width of the temporary diversion channel.
3. Construct channel at a minimum grade of 0.5 percent.
4. Do not construct with longitudinal joints if using a plastic liner. Bury the upstream edge of the liner a minimum of 6" deep and secure with riprap or sandbags.
5. When specified replace the portion of the diversion channel through the roadway embankment with temporary culvert. Compact temporary culvert backfill using one of the methods listed in Subsection 204.11(a).

NO SCALE

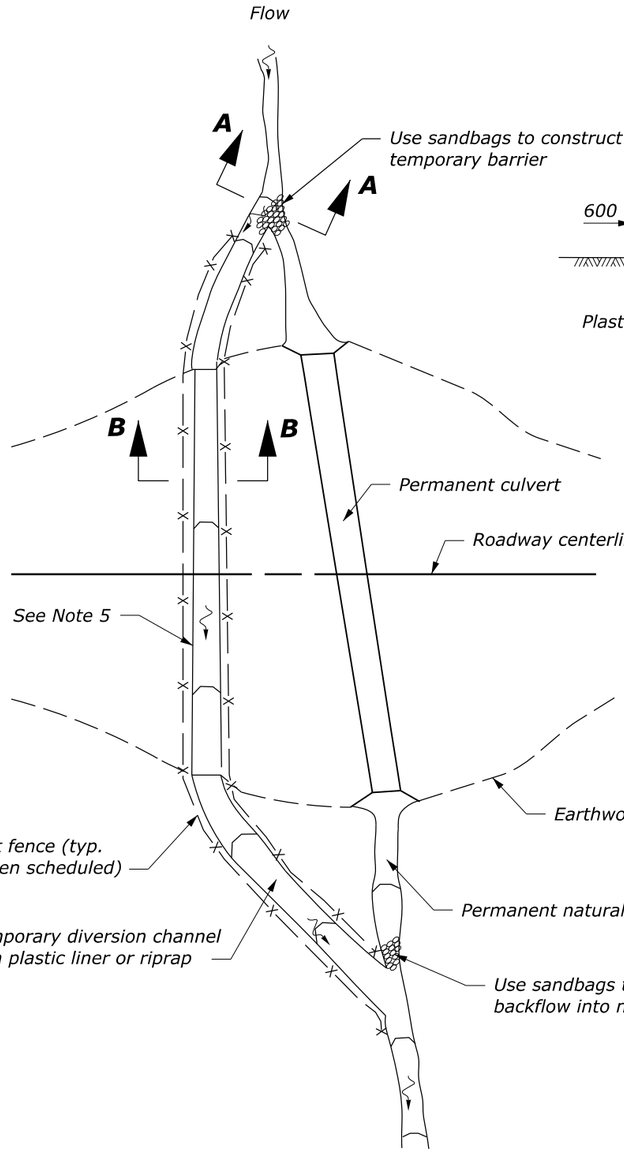
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
OFFICE OF FEDERAL LANDS HIGHWAY

FLH STANDARD

TEMPORARY DIVERSION CHANNELS

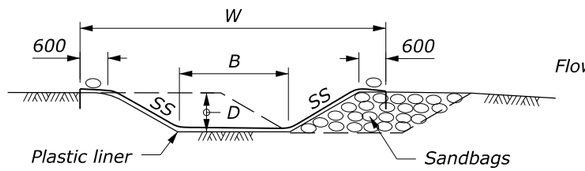
STANDARD APPROVED FOR USE 6/2005	STANDARD
REVISED: 6/2007 7/2022	157-5

PROJECT	SHEET NUMBER

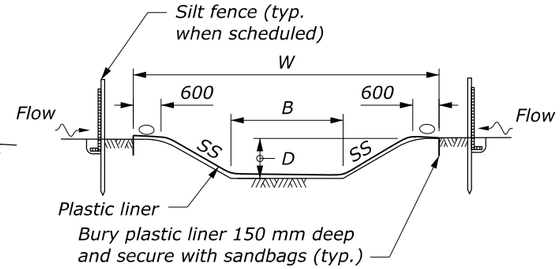


PLAN

DIVERSION CHANNEL

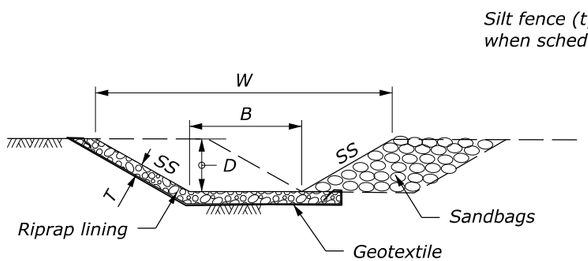


SECTION A-A

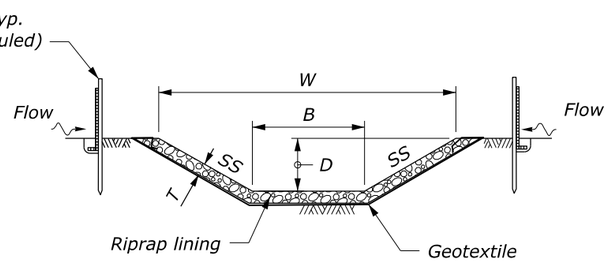


SECTION B-B

PLASTIC LINED DIVERSION CHANNEL

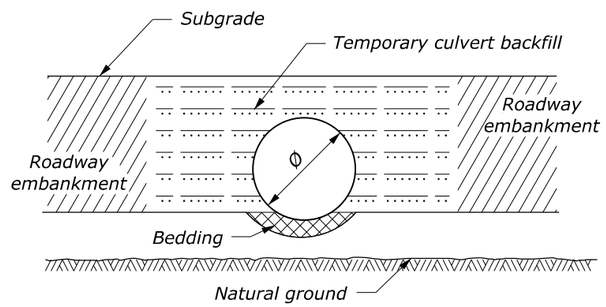


SECTION A-A



SECTION B-B

RIPRAP LINED DIVERSION CHANNEL



SECTION B-B

TEMPORARY CULVERT

NOTE:

1. *See Erosion Control Section for temporary culvert diameter, riprap class, channel dimensions and quantities.*
2. *Use plastic liner or riprap along the entire length and width of the temporary diversion channel.*
3. *Construct channel at a minimum grade of 0.5 percent.*
4. *Do not construct with longitudinal joints if using a plastic liner. Bury the upstream edge of the liner a minimum of 150 mm deep and secure with riprap or sandbags.*
5. *When specified replace the portion of the diversion channel through the roadway embankment with temporary culvert. Compact temporary culvert backfill using one of the methods listed in Subsection 204.11(a).*
6. *Dimensions without units are millimeters.*

NO SCALE

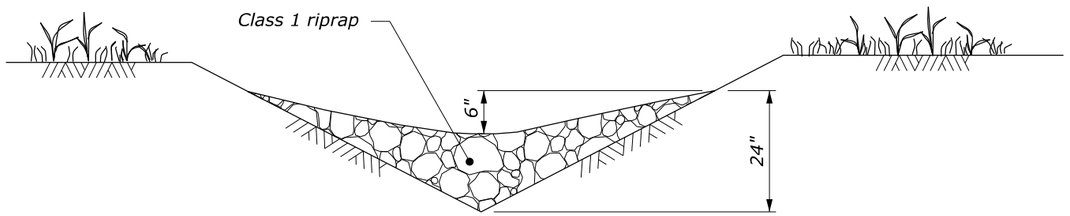
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
OFFICE OF FEDERAL LANDS HIGHWAY

METRIC FLH STANDARD

TEMPORARY DIVERSION CHANNELS

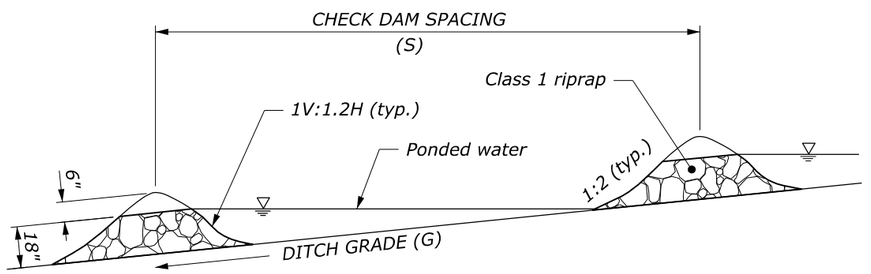
STANDARD APPROVED FOR USE 3/1996	STANDARD
REVISED: 6/1997 12/1998 6/2005 6/2007 7/2022	M157-5

PROJECT	SHEET NUMBER



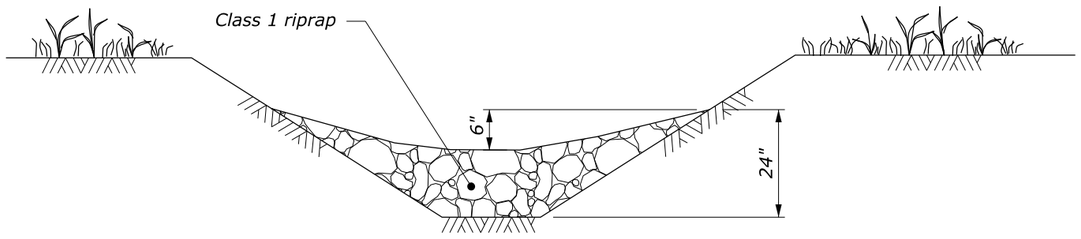
CROSS SECTION

V DITCH



PROFILE VIEW

DITCH



CROSS SECTION

TRAPEZOIDAL DITCH

DITCH GRADE (G)	*CHECK DAM SPACING S (ft)*
2%	*75*
3%	*50*
4%	*40*
5%	*30*
6%	*25*

** Do not use Check Dams below 2% or above 6% ditch grades.*

NO SCALE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
OFFICE OF FEDERAL LANDS HIGHWAY

FLH STANDARD

CHECK DAM

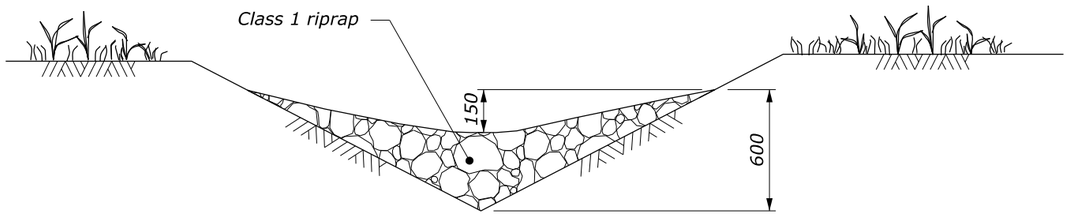
STANDARD APPROVED FOR USE 6/2005
REVISED: 6/2007

STANDARD
157-6

PROJECT	SHEET NUMBER

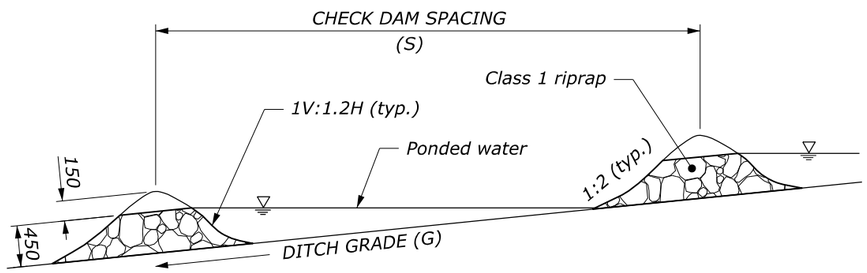
NOTE:

1. Dimensions without units are millimeters.



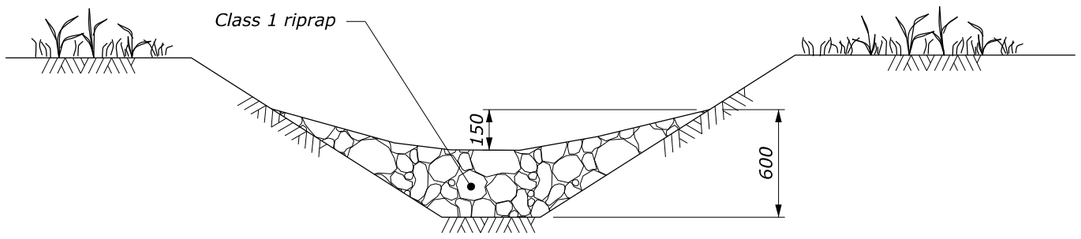
CROSS SECTION

V DITCH



PROFILE VIEW

DITCH



CROSS SECTION

TRAPEZOIDAL DITCH

DITCH GRADE (G)	CHECK DAM SPACING S (m)
2%	23
3%	15
4%	12
5%	9
6%	7.5

* Do not use Check Dams below 2% or above 6% ditch grades.

NO SCALE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
OFFICE OF FEDERAL LANDS HIGHWAY

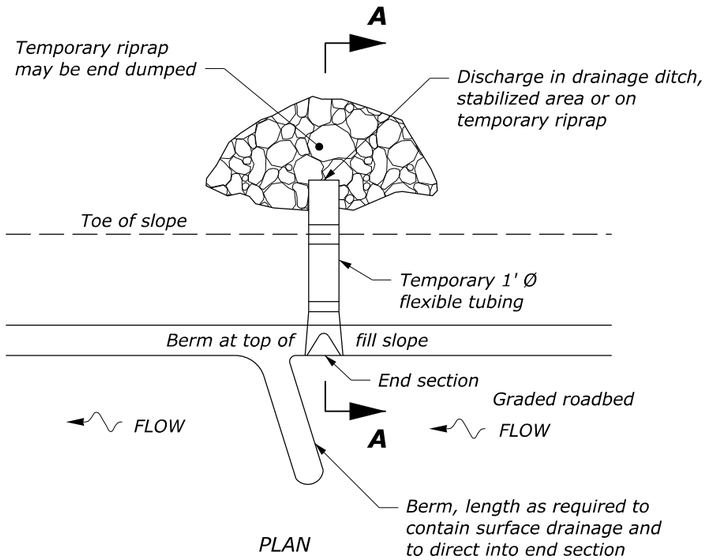
METRIC FLH STANDARD

CHECK DAM

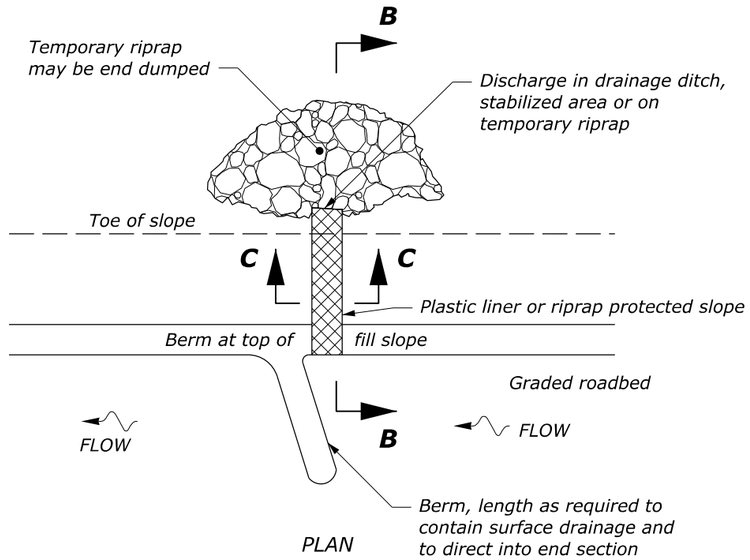
STANDARD APPROVED FOR USE 3/1996
REVISED: 6/2005 6/2007

STANDARD
M157-6

PROJECT	SHEET NUMBER



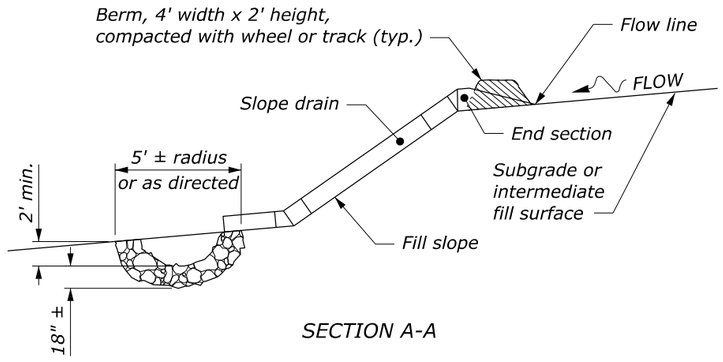
SLOPE DRAINS



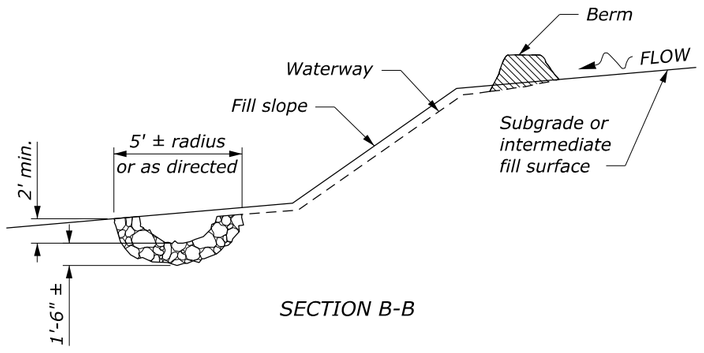
PLASTIC LINED WATERWAY

NOTE:

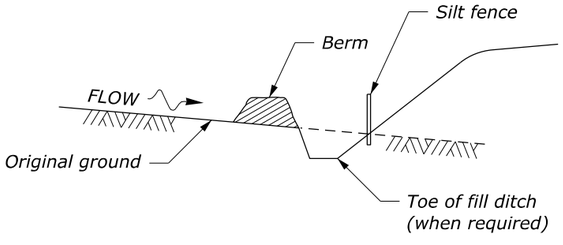
1. Use temporary slope drains (berms, drains, and riprap) as the embankment is constructed. Use spacings as shown on the Erosion Control Plans or as designated by the CO. Place all slope drains at the end of each work shift. Use slope drains until the slopes are permanently stabilized.
2. Construct temporary berms at the top of all erodible cut slopes as shown on the Erosion Control Plans or as designated by the CO. Use check dams to reduce the runoff velocity when existing grades are steep.
3. Do not use transverse or longitudinal joints in plastic liner. Plastic liner is not required for rock embankments.
4. Use toe-of-fill slope berms to divert offsite runoff away from disturbed areas.
5. Seed and mulch all cut slope berms and toe-of-fill berms immediately after berm construction.
6. Use Class 2 temporary riprap.



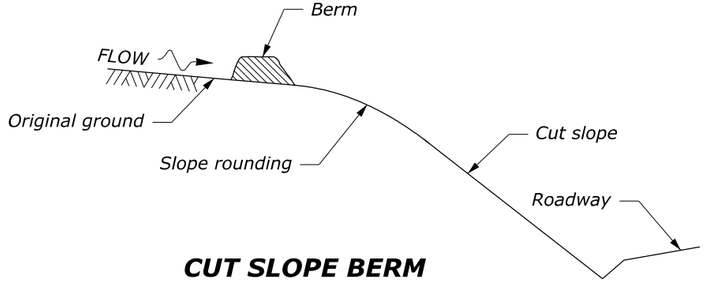
SECTION A-A



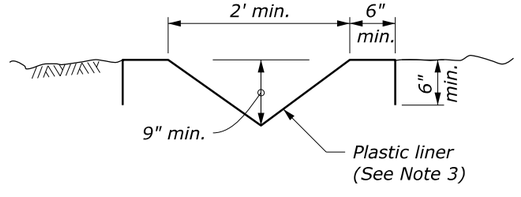
SECTION B-B



TOE-OF-FILL SLOPE BERM



CUT SLOPE BERM



SECTION C-C

NO SCALE

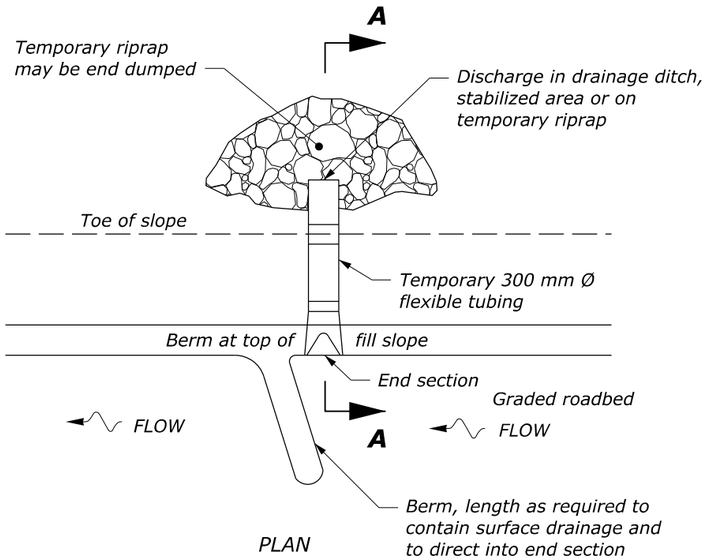
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
OFFICE OF FEDERAL LANDS HIGHWAY

FLH STANDARD

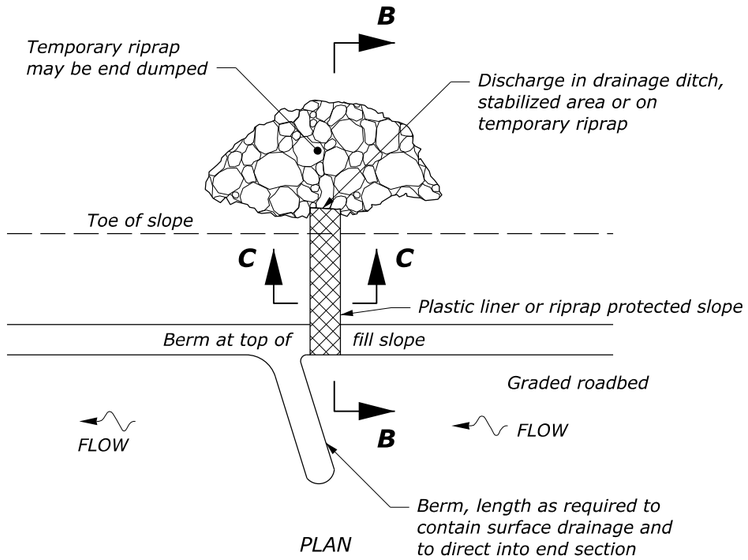
TEMPORARY EROSION CONTROL BERMS, SLOE DRAINS, AND LINED WATERWAYS

STANDARD APPROVED FOR USE 6/2005	STANDARD
REVISED:	157-7

PROJECT	SHEET NUMBER



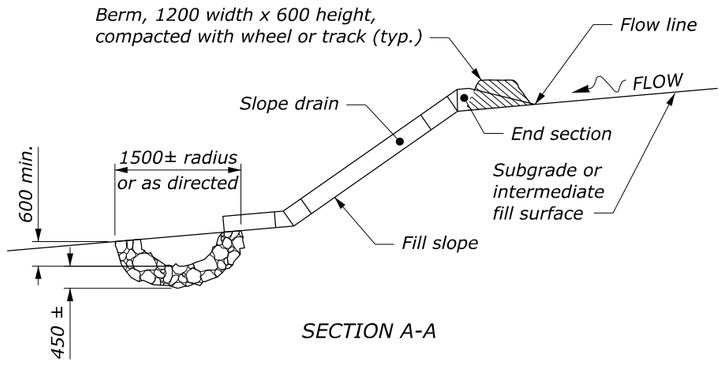
SLOPE DRAINS



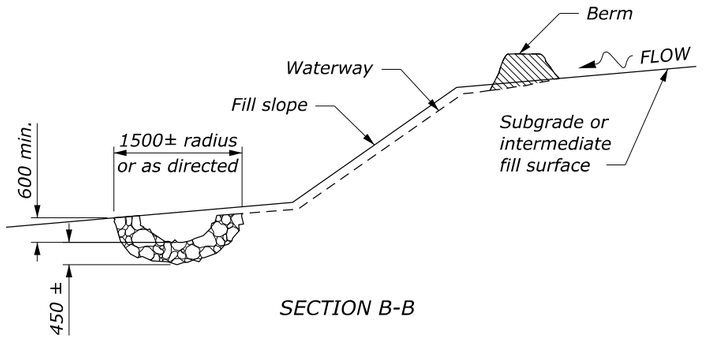
PLASTIC LINED WATERWAY

NOTE:

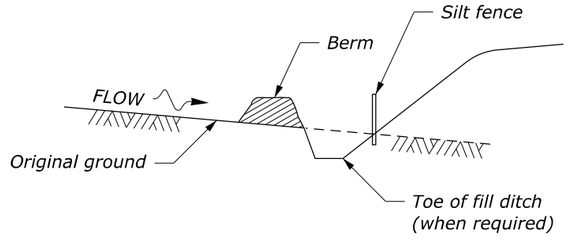
1. *Use temporary slope drains (berms, drains, and riprap) as the embankment is constructed. Use spacings as shown on the Erosion Control Plans or as designated by the CO. Place all slope drains at the end of each work shift. Use slope drains until the slopes are permanently stabilized.*
2. *Construct temporary berms at the top of all erodible cut slopes as shown on the Erosion Control Plans or as designated by the CO. Use check dams to reduce the runoff velocity when existing grades are steep.*
3. *Do not use transverse or longitudinal joints in plastic liner. Plastic liner is not required for rock embankments.*
4. *Use toe-of-fill slope berms to divert offsite runoff away from disturbed areas.*
5. *Seed and mulch all cut slope berms and toe-of-fill berms immediately after berm construction.*
6. *Use Class 2 temporary riprap.*
7. *Dimensions without units are millimeters.*



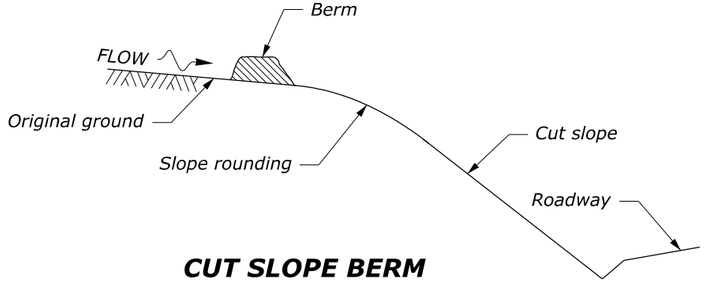
SECTION A-A



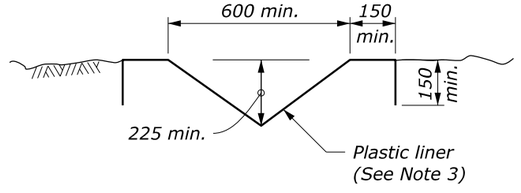
SECTION B-B



TOE-OF-FILL SLOPE BERM



CUT SLOPE BERM



SECTION C-C

NO SCALE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
OFFICE OF FEDERAL LANDS HIGHWAY

METRIC FLH STANDARD

TEMPORARY EROSION CONTROL BERMS, SLOPE DRAINGS, AND LINED WATERWATS

STANDARD APPROVED FOR USE 6/2005	STANDARD
REVISED: 6/2007	M157-7