

**DIAMETER OF PIPE**

DIMENSION	30"	36"	42"	48"	54"	60"	66"	DIMENSION
A	3'-9"	4'-4"	4'-11"	5'-6"	6'-1"	6'-8"	7'-5"	A
B	1'-3"	1'-6"	1'-9"	2'-0"	2'-3"	2'-6"	2'-9"	B
C	3'-6"	4'-0"	4'-7"	5'-1"	5'-8"	6'-2"	7'-0"	C
E	3'-1"	3'-8"	4'-3"	4'-10"	5'-5"	6'-0"	6'-7"	E
F	4'-4"	5'-0"	5'-8"	6'-4"	7'-0"	7'-8"	8'-7"	F
H	7'-6"	8'-8"	10'-0"	11'-2"	12'-6"	13'-8"	15'-2"	H
J	3'-9"	4'-4"	5'-0"	5'-7"	6'-3"	6'-10"	7'-7"	J
M			0'-5"				0'-6"	M
T	0'-3.5"	0'-4.0"	0'-4.5"	0'-5.0"	0'-5.5"	0'-6.0"	0'-6.5"	T
V			0'-8"				1'-0"	V
W			0'-8"				0'-10"	W
X							2'-0"	X
Y			2'-0"				2'-6"	Y
Z							1'-3"	Z

**CU YDS. CONC HEADWALLS**

3.36	4.10	5.35	6.53	7.82	9.22	18.76
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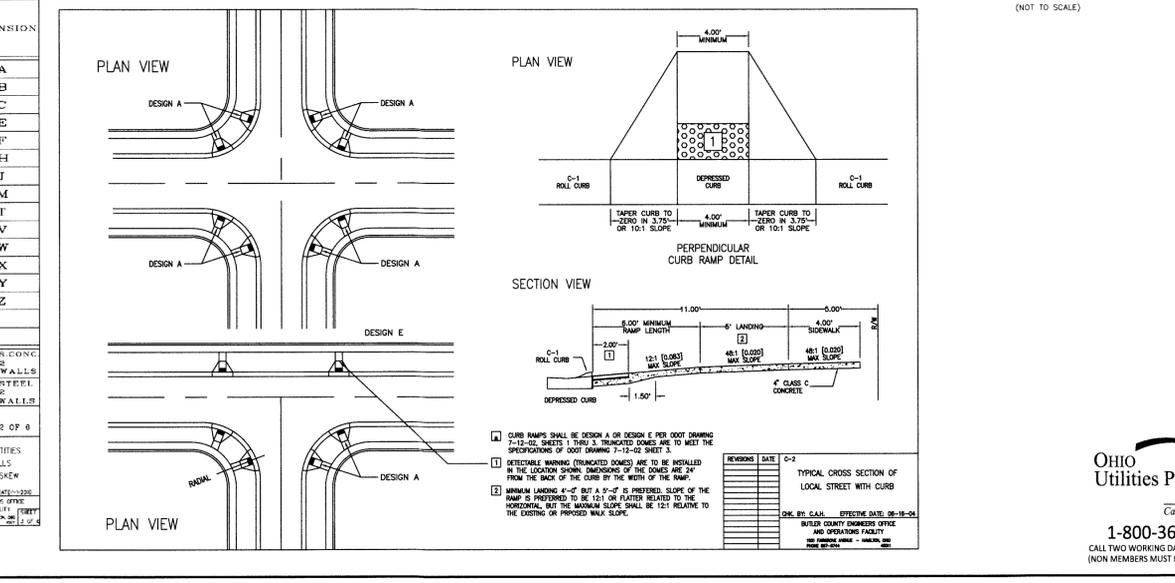
**CU YDS. CONC HEADWALLS**

281	363	430	496	583	687	1320
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**LB STEEL HEADWALLS**

281	363	430	496	583	687	1320
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**DIMENSIONS AND QUANTITIES ARE BASED ON CONCRETE PIPE AND WILL VARY SLIGHTLY FOR CORRUGATED METAL PIPE**



**MSP DESIGN**  
McGill Smith Punshon

3700 Park 42 Drive  
Suite 1908  
Cincinnati OH 45241  
Phone 513.759.0004  
www.mspdesign.com

Project Manager RA  
Drawn By NAK  
DWG 04476064-DET-00-SECTION 19&21  
X-Refs)

Issue/Revision No. Date  
XX/XX/XX

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**WINDING CREEK**  
**SECTIONS 19 & 21**  
**AKA CARRIAGE HILL**  
**SECTIONS 19 & 21**  
**SECTION 2, TOWN 2, RANGE 3**  
**LIBERTY TOWNSHIP**  
**BUTLER COUNTY, OHIO**

**ROADWAY & AUXILIARY**  
**VALVE BOX DETAIL**  
(NOT TO SCALE)

Sheet Title

**STANDARD DETAILS**

Project Number 04476.06  
Drawing Scale N.T.S.  
Sheet Number 9/12  
File Number 04476

**Ohio Utilities Protection Service**  
Call Before You Dig  
1-800-362-2764  
CALL TWO WORKING DAYS BEFORE YOU DIG (NON MEMBERS MUST BE CALLED DIRECTLY)





Specifications for Permanent Seeding

**SITE PREPARATION**

1. A subsoiler, plow or other implement shall be used to reduce soil compaction and allow maximum infiltration. (Maximizing infiltration will help control both runoff rate and water quality.) Subsoiling should be done when the soil moisture is low enough to allow the soil to crack or fracture. Subsoiling shall not be done on slip-prone areas where soil preparation should be limited to what is necessary for establishing vegetation.

2. The site shall be graded as needed to permit the use of conventional equipment for seedbed preparation and seeding.

3. Resoil shall be applied where needed to establish vegetation.

**2. Materials**

- Straw—If straw is used it shall be unrotted small-grain straw applied at the rate of 2 tons/ac. or set to 1,000 sq. ft. (two to three bales). The mulch shall be spread uniformly by hand or mechanically so the soil surface is covered. For uniform distribution of hand-spread mulch, divide area into approximately 1,000-sq.-ft. sections and spread two 45-lb. bales of straw in each section.
- Hydroseeders—If wood cellulose fiber is used, it shall be used at 2,000 lb./ac. or 46 lb./1,000 sq. ft.
- Other—Other acceptable mulches include mulch matings applied according to manufacturer's recommendations or wood chips applied at 6 tons/ac.

**SEEDBED PREPARATION**

1. Lime—Agricultural ground limestone shall be applied to acid soil as recommended by soil test. In lieu of a soil test, lime shall be applied at the rate of 100 lbs./1,000 sq. ft. or 2 tons/ac.

2. Fertilizer—Fertilizer shall be applied as recommended by soil test. In lieu of a soil test, fertilizer shall be applied at a rate of 12 lb./1,000 sq. ft. or 500 lb./ac. of 10-10-10 or 12-12-12 analysis.

3. The lime and fertilizer shall be worked into the soil with a disk harrow, spring-tooth harrow, or other suitable field implement to a depth of 3 in. On sloping land the soil shall be worked on the contour.

**3. Straw Mulch Anchoring Methods**

Straw mulch shall be anchored immediately to minimize loss by wind or water.

- Mechanical—A disk, crimper, or similar type tool shall be set straight to punch or anchor the mulch material into the soil. Straw mechanically anchored shall not be finely chopped but, generally, be left longer than 6 in.
- Mulch Nettings—Netting shall be used according to the manufacturer's recommendations. Netting may be necessary to hold mulch in place in areas of concentrated runoff and on critical slopes.

**SEEDING DATES AND SOIL CONDITIONS**

Seeding should be done March 1 to May 31 or Aug. 1 to September 30. These seeding dates are ideal but, with the use of additional mulch and irrigation, seeding may be made any time throughout the growing season. Tillage/seedbed preparation should be done when the soil is dry enough to crumble and not form ribbons when compressed by hand. For winter seeding, irrigation should be provided when the soil is dry enough to crumble and not form ribbons when compressed by hand. For winter seeding, irrigation should be provided when the soil is dry enough to crumble and not form ribbons when compressed by hand.

**Asphalt Emulsion—Asphalt** shall be applied as recommended by the manufacturer or at the rate of 160 gal./ac.

- Synthetic Binders—Synthetic binders such as Acrylic DLR (Agri-Tac), DCA-70, Petrosel, Terra Tack or equivalent may be used at rates recommended by manufacturer.
- Wood Cellulose Fiber—Wood cellulose fiber binder shall be applied at a net dry weight of 750 lb./ac. The wood cellulose fiber shall be mixed with water and the mixture shall contain a maximum of 50 lbs./100 gal.

**DORMANT SEEDINGS**

1. Seeding shall not be planted from October 1 through November 20. During this period the seeds are likely to germinate, but probably will not be able to survive the winter.

2. The following methods may be used for "Dormant Seeding":

- From October 1 through November 20, prepare the seedbed, and the required amounts of lime and fertilizer, then mulch and anchor. After November 20, and before March 15, broadcast the selected seed mixture, mulch and anchor. Increase the seeding rates by 50% for this type of seeding.
- From November 20 through March 15, when soil conditions permit, prepare the seedbed, lime and fertilizer, apply the selected seed mixture, mulch and anchor. Increase the seeding rates by 50% for this type of seeding.

**IRRIGATION**

1. Permanent seeding shall include irrigation to establish vegetation during dry or hot weather or an adverse site condition as needed for adequate moisture for seed germination and plant growth.

2. Excessive irrigation rates shall be avoided and irrigation monitored to prevent erosion and damage from runoff.

**MULCHING**

1. Mulch material shall be applied immediately after seeding. Seeding made during optimum seeding dates and with favorable soil conditions and mulch to achieve adequate stabilization. Dormant seeding shall be mulched.

2. Seeding Method—Seed shall be applied uniformly with a cyclone seeder, drill, cutlifter seeder, or hydro-seeder (slurry may include seed and fertilizer) on a firm, moist seedbed.

- Where feasible, except when a cutlifter type seeder is used, the seedbed should be firmed following seeding operations with a cutlifter, roller or light drag. On sloping land, seeding operations should be on the contour where feasible.

Specifications for Permanent Seeding

1. Permanent seeding shall not be considered established for at least 1 full year from the time of planting. Seeded areas shall be inspected for failure and reestablished as needed. Depending on site conditions, it may be necessary to irrigate, fertilize, overseed, or reestablish plantings in order to provide permanent vegetation for adequate erosion control.

2. Maintenance fertilization rates shall be established by soil test recommendations or by using the rates shown in the following table.

Mixture	Formula	lb./ac.	lb./1,000 ft. <sup>2</sup>	Time	Mowing
Creeping Red Fescue Ryegrass Kentucky Bluegrass	10-10-10	500	12		Not closer than 3'
Tall Fescue	10-10-10	500	12	Fall, yearly or as needed.	Not closer than 4'
Dwarf Fescue	10-10-10	500	12		Not closer than 2'
Crown Vetch Fescue	0-20-20	400	10	Spring, yearly following establishment and every 4-7 yr. thereafter.	Do not mow
Flat Pea Fescue	0-20-20	400	10		Do not mow

Note: Following soil test recommendations is preferred to fertilizer rates shown above.

Specifications for Temporary Seeding

Seeding Dates	Species	lb./1,000 ft. <sup>2</sup>	Per Ac.
March 1 to August 15	Oats	3	4 bushel
	Tall Fescue	1	40 lb.
	Annual Ryegrass	1	40 lb.
August 16 to November 1	Rye	3	2 bushel
	Tall Fescue	1	40 lb.
	Annual Ryegrass	1	40 lb.
November 1 to Spring Seeding	Wheat	3	2 bushel
	Tall Fescue	1	40 lb.
	Annual Ryegrass	1	40 lb.

Note: Other approved seed species may be substituted.

**2. Materials:**

- Straw—If straw is used, it shall be unrotted small-grain straw applied at the rate of 2 tons/ac. or 80 lb./1,000 sq. ft. (two to three bales). The mulch shall be spread uniformly by hand or mechanically so the soil surface is covered. For uniform distribution of hand-spread mulch, divide area into approximately 1,000 sq. ft. sections and spread two 45 lb. bales of straw in each section.
- Hydroseeders—If wood cellulose fiber is used, it shall be used at 2,000 lb./ac. or 46 lb./1,000 sq. ft.
- Other—Other acceptable mulches include mulch matings applied according to manufacturer's recommendations or wood chips applied at 6 tons/ac.
- Asphalt Emulsion—Asphalt shall be applied as recommended by the manufacturer or at the rate of 160 gal./ac.
- Synthetic Binders—Synthetic binders such as Acrylic DLR (Agri-Tac), DCA-70, Petrosel, Terra Tack or equivalent may be used at rates recommended by manufacturer.
- Wood Cellulose Fiber—Wood cellulose fiber binder shall be applied at a net dry weight of 750 lb./ac. The wood cellulose fiber shall be mixed with water and the mixture shall contain a maximum of 50 lbs./100 gal.

1. Structural erosion and sediment control practices such as diversions and sediment traps shall be installed and stabilized with temporary seeding prior to grading the rest of the construction site.

2. Temporary seed shall be applied between construction operations on soil that will not be graded or reworked for 21 days or more. These idle areas should be seeded as soon as possible after grading or soil shall be seeded within 7 days. Several applications of temporary seeding are necessary on typical construction projects.

3. The seedbed should be pulverized and loose to ensure the success of establishing vegetation. However, temporary seeding shall not be postponed if ideal seedbed preparation is not possible.

4. Soil Amendments—Applications of temporary vegetation shall establish adequate stands of vegetation that may require the use of soil amendments. Soil tests should be taken on the site to predict the need for lime and fertilizer.

5. Seeding Method—Seed shall be applied uniformly with a cyclone seeder, drill, cutlifter seeder, or hydro-seeder. When feasible, seed that has been broadcast shall be covered by raking and dragging and then lightly tamped in place using a roller or cutlifter. If hydroseeding is used, the seed and fertilizer shall be mixed on site and immediately and without interruption.

**MULCHING TEMPORARY SEEDING**

1. Applications of temporary seeding shall include mulch that shall be applied during or immediately after seeding. Seeding made during optimum seeding dates and with favorable soil conditions and on very flat areas may not need mulch to achieve adequate stabilization.

- Mechanical—A disk, crimper, or similar type tool shall be set straight to punch or anchor the mulch material into the soil. Straw mechanically anchored shall not be finely chopped but, generally, be left longer than 6 in.
- Mulch Nettings—Netting shall be used according to the manufacturer's recommendations. Netting may be necessary to hold mulch in place in areas of concentrated runoff and on critical slopes.
- Asphalt Emulsion—Asphalt shall be applied as recommended by the manufacturer or at the rate of 160 gal./ac.
- Synthetic Binders—Synthetic binders such as Acrylic DLR (Agri-Tac), DCA-70, Petrosel, Terra Tack or equivalent may be used at rates recommended by manufacturer.
- Wood Cellulose Fiber—Wood cellulose fiber binder shall be applied at a net dry weight of 750 lb./ac. The wood cellulose fiber shall be mixed with water and the mixture shall contain a maximum of 50 lbs./100 gal.

Specifications for Mulching

1. Mulch and/or other appropriate vegetative practices shall be applied to disturbed areas within 7 days of grading. If the area is to remain dormant (undisturbed) for more than 45 days or on areas and portions of the site which can be brought to final grade.

2. Mulch shall consist of one of the following:

- Straw—Straw shall be unrotted small-grain straw applied at the rate of 2 tons/ac. or 80 lb./1,000 sq. ft. (two to three bales). The mulch shall be spread uniformly by hand or mechanically so the soil surface is covered. For uniform distribution of hand-spread mulch, divide area into approximately 1,000 sq. ft. sections and spread two 45 lb. bales of straw in each section.
- Hydroseeders—Wood cellulose fiber should be used at 2,000 lb./ac. or 46 lbs./1,000 sq. ft.
- Other—Other acceptable mulches include mulch matings applied according to manufacturer's recommendations or wood chips applied at 10-20 tons/ac.

3. Mulch Anchoring—Mulch shall be anchored immediately to minimize loss by wind or runoff. The following are accepted methods for anchoring mulch:

- Mechanical—Use a disk, crimper, or similar type tool set straight to punch or anchor the mulch material into the soil. Straw mechanically anchored shall not be finely chopped but generally be left longer than 6 in.
- Mulch Nettings—Use according to the manufacturer's recommendations, following all placement and anchoring suggestions. Use in areas of water concentration and steep slopes to hold mulch in place.
- Asphalt Emulsion—For straw mulch, apply at the rate of 160 gal./ac. (0.1 gal./sq. yd) into the mulch as it is being applied or as recommended by the manufacturer.
- Synthetic Binders—For straw mulch, synthetic binders such as acrylic DLR (Agri-Tac), DCA-70, Petrosel, Terra Tack or equivalent may be used at rates recommended by manufacturer.
- Wood Cellulose Fiber—Wood cellulose fiber may be used for anchoring straw. The fiber binder shall be applied at a net dry weight of 750 lb./ac. The wood cellulose fiber shall be mixed with water and the mixture shall contain a maximum of 50 lbs./100 gal.

4. Mulch Nettings—Netting shall be used according to the manufacturer's recommendations. Netting may be necessary to hold mulch in place in areas of concentrated runoff and on critical slopes.

5. Synthetic Binders—For straw mulch, synthetic binders such as acrylic DLR (Agri-Tac), DCA-70, Petrosel, Terra Tack or equivalent may be used at rates recommended by manufacturer.

6. Wood Cellulose Fiber—Wood cellulose fiber may be used for anchoring straw. The fiber binder shall be applied at a net dry weight of 750 lb./ac. The wood cellulose fiber shall be mixed with water and the mixture shall contain a maximum of 50 lbs./100 gal.

**MATERIALS**

1. Sod shall be harvested, delivered and installed within a period of 48 hrs. Sod not transported within this period shall be inspected and approved prior to installation.

2. The sod shall be kept moist and covered during hauling and prepared for placement on the sod bed.

3. Sod shall be machine cut at a uniform soil thickness of 0.75 in., plus or minus 0.25 in., at the time of cutting. Measurements for thickness shall exclude top growth and thatch.

**SOD INSTALLATION**

1. During periods of excessively high temperatures, the soil shall be lightly irrigated immediately prior to laying the sod.

2. Sod shall not be placed on frozen soil.

3. The first row of sod shall be laid in a straight line with subsequent rows placed parallel to and tightly wedged against each other. Lateral joints shall be staggered in a brick-like pattern. Ensure that the sod is not stretched or overlapped and that all joints are butted tight in order to prevent voids which would dry the roots.

4. On sloping areas where erosion may be a problem, sod shall be laid with the long edge parallel to the contour and with staggered joints. The sod shall be secured with pegs or staples.

5. As sodding is completed in any one section, the entire area shall be rolled or tamped to ensure solid contact of roots with the soil surface. Sod shall be watered immediately after rolling or tamping until the sod and soil surface below the sod is thoroughly wet. The operations of laying, tamping and irrigating for any piece of sod shall be completed within 8 hrs.

**SITE PREPARATION**

1. A subsoiler, plow or other implement shall be used to reduce soil compaction and allow maximum infiltration. (Maximizing infiltration will help control both runoff rate and water quality.) Subsoiling shall not be done on slip-prone areas where soil preparation should be limited to what is necessary for establishing vegetation.

2. The area shall be graded and resoil shall be done where needed.

3. Soil Amendments:

- Lime—Agricultural ground limestone shall be applied to acid soil as recommended by a soil test. In lieu of a soil test, lime shall be applied at the rate of 100 lbs./1,000 sq. ft. or 2 tons/ac.
- Fertilizer—Fertilizer shall be applied as recommended by a soil test. In lieu of a soil test, fertilizer shall be applied at a rate of 12 lb./1,000 sq. ft. or 500 lb./ac. of 10-10-10 or 12-12-12 analysis.

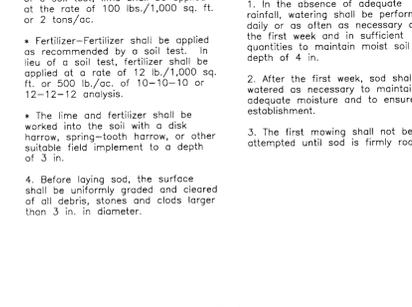
**SOD MAINTENANCE**

1. In the absence of adequate rainfall, watering shall be performed daily or as often as necessary during the first week and in sufficient quantities to maintain moist soil to a depth of 4 in.

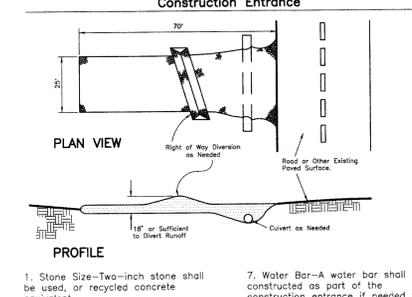
2. After the first week, sod shall be watered as necessary to maintain adequate moisture and to ensure establishment.

3. The first mowing shall not be attempted until sod is firmly rooted, of 3 in.

**CONSTRUCTION ENTRANCE**

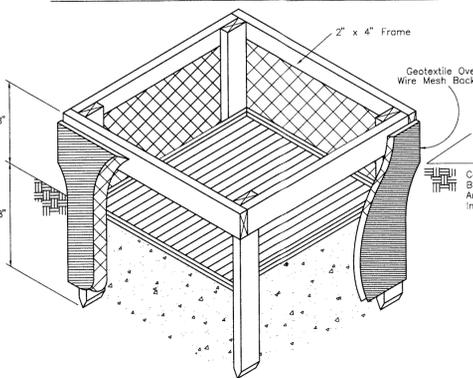


**MULCH BERM DETAIL**



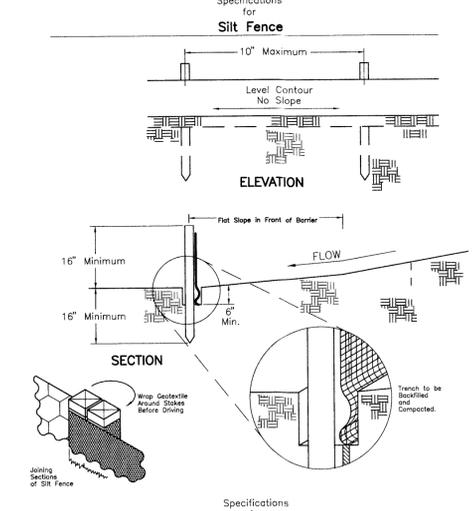
1. Stone Size—Two-inch stone shall be used, or recycled concrete equivalent.
2. Length—The construction entrance shall be 70' long.
3. Thickness—The stone layer shall be at least 6 in. thick.
4. Width—The entrance shall be 25' wide.
5. Bedding—A geotextile shall be placed over the entire area prior to placing stone. It shall have a Grab Tensile Strength of at least 200 lb. and a Mullen Burst Strength of at least 190 lbs.
6. Culvert—A pipe or culvert shall be constructed under the entrance if needed to prevent surface water from flowing across the entrance from being directed out onto paved surfaces.
7. Water Bar—A water bar shall be constructed as part of the construction entrance if needed to prevent surface runoff from flowing the length of the construction entrance and out onto paved surfaces.
8. Maintenance—Top dressing of additional stone shall be applied as conditions demand. Mud spilled, dropped, washed or tracked onto public roads, or any surface where runoff is not checked by sediment controls, shall be removed immediately. Removal shall be accomplished by scraping or sweeping.
9. Construction entrances shall not be relied upon to remove mud from vehicles and prevent off-site tracking. Vehicles that enter and leave the flowing across the site shall be restricted from muddy areas.
10. Seams between section of silt fence shall be overlapped with the

Specifications for Inlet Protection in Swales, Ditch Lines or Yard Inlets



1. Inlet protection shall be constructed either before upslope land disturbance begins or before the storm drain becomes operational.
2. The earth around the inlet shall be excavated completely to a depth of at least 18 in.
3. The wooden frame shall be constructed of 2-by-4 in. construction grade lumber. The 2-by-4 in. posts shall be driven 1 ft. into the ground at four corners of the inlet and the top portion of 2-by-4 in. frame assembled using the overlap joint shown. The top of the frame shall be at least 6 in. below adjacent roads if ponded water would pose a safety hazard to traffic.
4. Wire mesh shall be of sufficient strength to support fabric with the inlet not in a depression and if runoff bypassing the inlet will not flow to a settling pan. The top of the earth dikes shall be at least 6 in. higher than the top of the frame.
5. Geotextile shall have an equivalent opening size of 20-40 sieve and be resistant to sunlight. It shall be stretched tightly around the frame and fastened securely. It shall extend from the top of the frame to 18 in. below the inlet overlap elevation. The geotextile shall overlap across one side of the inlet so the ends of the cloth are not fastened to the same post.
6. Backfill shall be placed around the inlet in compacted 6-in. layers until the earth is even with inlet elevation on ends and top elevation on sides.
7. A compacted earth dike or a check dam shall be constructed in the ditch line below the inlet if the inlet is not in a depression and if runoff bypassing the inlet will not flow to a settling pan. The top of the earth dikes shall be at least 6 in. higher than the top of the frame.

**SILT FENCE**

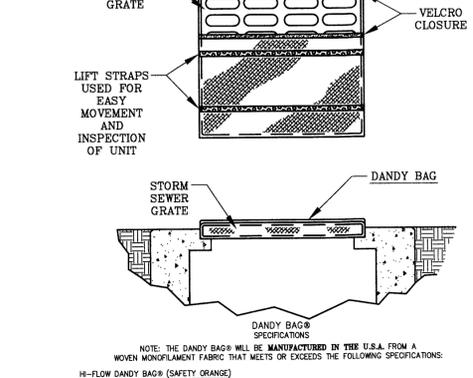


**CONSTRUCTION ENTRANCE**

1. Silt fence shall be constructed before upslope land disturbance begins.
2. All silt fences shall be placed as close to the contour as possible so that water will not concentrate at low points in the fence and so that small swales or depressions, which may carry small concentrated flows to the silt fence, are dissipated along its length.
3. To prevent water ponded by the silt fence from flowing around the ends, each end shall be constructed upslope so that the ends are at a higher elevation.
4. Where possible, silt fence shall be placed on the flattest area available.
5. Where possible, vegetation shall be preserved for 5 ft. (or as much as possible) upslope from the silt fence. If vegetation is removed, it shall be reestablished within 7 days from the installation of the silt fence.
6. The height of the silt fence shall be a minimum of 18 in. above the original ground surface.
7. The silt fence shall be placed in a trench cut a minimum of 6 in. deep. The trench shall be cut with a trencher, cable laying machine, or other suitable device that will ensure an adequately uniform trench depth.
8. The silt fence shall be placed with the stakes on the downslope side of the geotextile and 8-in. of cloth are below the ground surface. Excess material shall lie on the bottom of the 6-in. deep trench. The trench shall be backfilled and compacted.
9. Seams between section of silt fence shall be overlapped with the

Mechanical Properties	Test Method	Units
Grab Tensile Strength	ASTM D 4832	N (lbs)
Grab Tensile Elongation	ASTM D 4832	%
Mullen Burst Strength	ASTM D 3786	psi (psi)
Trapezoid Tear Strength	ASTM D 4533	N (lbs)
UV Resistance	ASTM D 2555	%
Apparent Opening Size	ASTM D 4751	mm (US Std Sieve)
Flow Rate	ASTM D 4461	l/min/200' (cm <sup>3</sup> /ft <sup>3</sup> )
Permeability	ASTM D 4481	Sec <sup>2</sup>

Specifications for DANDY BAG®

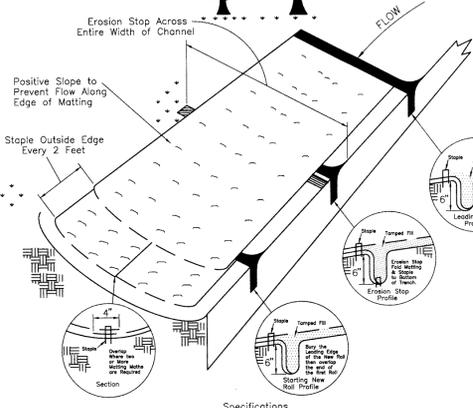


NOTE: THE DANDY BAGS WILL BE MANUFACTURED IN THE U.S.A. FROM A WOVEN MONOFILAMENT FABRIC THAT MEETS OR EXCEEDS THE FOLLOWING SPECIFICATIONS:

Mechanical Properties	Test Method	Units
Grab Tensile Strength	ASTM D 4832	N (lbs)
Grab Tensile Elongation	ASTM D 4832	%
Mullen Burst Strength	ASTM D 3786	psi (psi)
Trapezoid Tear Strength	ASTM D 4533	N (lbs)
UV Resistance	ASTM D 2555	%
Apparent Opening Size	ASTM D 4751	mm (US Std Sieve)
Flow Rate	ASTM D 4461	l/min/200' (cm <sup>3</sup> /ft <sup>3</sup> )
Permeability	ASTM D 4481	Sec <sup>2</sup>

Note: All Dandy Bags® can be ordered with our optional absorbent pillows.

Specifications for Matting



**CONSTRUCTION ENTRANCE**

1. Material—Excelsior matting shall be 48 in. wide and weigh an average of 0.75 lb./sq. yd. or greater. Jute matting shall be 48 in. wide and weigh an average of 1.2 lb./yd. or greater. Matting made of other material and providing equal or greater stabilization than the above may be substituted.
2. Site Preparation—After the site has been shaped and graded, a seedbed shall be prepared that is relatively free of foreign material, clods or rocks that are greater than 1.5 in. in diameter. The site shall be prepared to ensure that the matting has good soil contact and the matting will not "bridge" or "tent" over obstructions.
3. Matting shall be held in place as recommended by the manufacturer as adequate for the site conditions or with sod staples. Sod staples are U-shaped wire staples used for fastening sod, jute or excelsior matting and other erosion-control materials to the soil surface. Sod staples shall be No. 11 gauge or heavier and be 6-10 in. in length. In loose or sandy soils, longer staples shall be used.
4. Planting—Lime and fertilizer shall be used according to the recommendation of a soil test or the seeding plan. Seed according to the manufacturer's recommendations; or, for excelsior matting, seed area to be protected before installation; or, when using jute matting, apply half the seed before and half the seed after installation.
5. Matting shall be installed as specified by the manufacturer as appropriate for the site conditions or the following procedure may be used:
  - After the site is prepared and erosion stops are installed, start laying the mat from the top of the slope or channel and unroll the matting allowing 4 in. overlaps at the edges.

6. Erosion stops shall be used where recommended by the matting manufacturer and on areas specified where high-erosion potential may cause undermining and gullies to form beneath the matting.
7. Erosion stops shall be made of strips of matting placed in narrow trenches 6-12 in. deep that cover the full cross section of the channel. They shall be spaced according to the manufacturer's recommendations or by the following:
  - 3 ft. down the channel from each point of entry of concentrated flow.
  - at points where change in gradient or direction of channel occurs, and
  - on long slopes at spacing from 20-100 ft. depending on the erodibility of the soil, velocity and volume of flow.
8. Erosion stops shall extend beyond the channel liner to the full design width of the channel. This will check any rills that might form outside or along the edge of the channel lining.
9. Erosion stops shall be constructed with a 6 in. deep trench, backfilled and tamped firmly to conform to the cross section of the channel.
10. If seeding has been done prior to installation of erosion stops, reseed disturbed areas prior to placement of channel liner.

Seed Mix	Seeding Rate		Notes:
	lb./ac.	lb./1,000 ft. <sup>2</sup>	
<b>General Use</b>			
Creeping Red Fescue	20-40	1/2-1	
Domestic Ryegrass	10-20	1/4-1/2	
Kentucky Bluegrass	10-20	1/4-1/2	
Tall Fescue	40	1	
Dwarf Fescue	40	1	
<b>Steep Banks or Cut Slopes</b>			
Tall Fescue	40	1	
Crown Vetch	10	1/4	Do not seed later than August
Tall Fescue	20	1/2	
Flat Pea	20	1/2	Do not seed later than August
Tall Fescue	20	1/2	
<b>Road Ditches and Swales</b>			
Tall Fescue	40	1	
Dwarf Fescue	90	2 1/4	
Kentucky Bluegrass	60	1 1/2	
Perennial Ryegrass	60	1 1/2	
Kentucky Bluegrass	60	1 1/2	For shaded areas
Perennial Ryegrass	60	1 1/2	

Note: Other approved seed species may be substituted.