CITY OF JEFFERSON
STANDARD DRAWINGS
REVISED: 1/2020
8TH EDITION

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### ADDITIONAL STANDARD DRAWINGS

A.P.W.A. Division III Standard Drawings, As per City of Jefferson Ordinance No. 14154

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SODDING

LAY SOD IN A STAGGERED PATTERN. BUTT THE STRIPS TIGHTLY AGAINST EACH OTHER, DO NOT LEAVE SPACES AND DO NOT OVERLAP. A SHARP-EDGED MASON'S TROWEL IS A HANDY TOOL FOR TUCKING DOWN THE ENDS AND TRIMMING PIECES.

INcorrect

CORRECT

BUTTING - MOVED ENDS CAUSED BY THE AUTOMATIC SOD CUTTER MUST BE MATCHED CORRECTLY.

SODDING NOTES:

A) SODDING:
1. THE SOD SHALL BE DENSELY ROOTED NURSERY CROWN, AND A PERENNIAL GRASS. THE SOD SHALL CONTAIN A GROWTH OF NOT MORE THAN 10 PERCENT OF OTHER GRASSES. SOD WILL BE FREE FROM ALL PROHIBITED AND NOXIOUS WEEDS, AND SHALL BE CUT IN STRIPS OF UNIFORM THICKNESS. THE RANGE OF ACCEPTABLE THICKNESS SHALL BE 1 1/2 TO 1 1/2 INCHES, WITH EACH STRIP CONTAINING AT LEAST ONE (1) SQUARE YARD. SOD SHALL BE CUT IN STRIPS NOT LESS THAN 12 INCHES WIDE.
2. FERTILIZER SHALL BE INORGANIC 12-12-12 OR 13-13-13 GRADE, UNIFORM IN COMPOSITION, FREE FLOWING, SUITABLE FOR APPLICATION WITH APPROVED EQUIPMENT, AND DELIVERED TO THE SITE IN CONVENIENT CONTAINERS, EACH FULLY LABELED. LABELS SHALL CONFORM TO APPLICABLE STATE FERTILIZER LAWS AND BEARING THE NAME, TRADE NAME OR TRADEMARK, AND WARRANT OF THE MANUFACTURER.
3. BEFORE TILLING OPERATIONS, FERTILIZER SHALL BE SPREAD UNIFORMLY AT THE RATE OF 300 POUNDS PER ACRE. FERTILIZING RATE IS EQUIVALENT TO 3.5 POUND PER SODDING SQUARE FOOT.
4. THE SOD BED SHALL HAVE A UNIFORM SURFACE FREE FROM WASHES AND DEPRESSIONS. IT SHALL CONFORM TO THE FINISHED GRADE PROFILE AND CROSS SECTION SHOWN ON THE PLANS. THE SOD, EXCEPT WHERE FRESH TOP SOIL HAS BEEN APPLIED AND COMPACTED, SHALL BE THOROUGHLY TILLED TO A DEPTH OF 2 INCHES.
5. FRESHLY GRADED AREAS WHICH HAVE SET LONG ENOUGH TO BECOME DRY AND CRUSTED OVER SHALL BE TILLED AS SPECIFIED ABOVE, BEFORE PLACING THE SOD.
6. SOD SHALL NOT BE PLACED DURING A DROUGHT NOR ON FROZEN GROUND UNLESS AUTHORIZED BY THE ENGINEER.
7. SOD SHALL BE MOIST WHEN IT IS PLACED. SOD STRIPS SHALL BE LAY ALONG CONTOUR LINES, COMMENCING AT THE LOWEST POINT OF THE AREA AND WORKING UPWARD. THE TRANSVERSE JOINTS OF SOD STRIPS SHALL BE STAGGERED AND THE SOD CAREFULLY PLACED TO PRODUCE TIGHT JOINTS. THE SOD SHALL BE FIRMED AND WATERED IMMEDIATELY AFTER IT IS PLACED.
8. ON 24-V SLOPES OR STEEPER THE SOD SHALL BE ANCHORED WITH 1/2-INCH SQUARE BY 8-INCH LONG WOODEN PEGS Driven INTO THE GRADE. 3 PEGS TO THE SQUARE YARD OR OTHER APPROVED CONFIGURATION. PEGS SHALL BE DRIVE IMMEDIATELY AFTER SOD IS FIRMED. THE AREA SHALL THEN BE CLEARED OF LOOSE SOD, EXCESS OR BROKEN ANCHORS, EXCESSIVE SOIL, AND OTHER FOREIGN MATERIALS.

ROLL SOD IMMEDIATELY TO ACHIEVE TIGHT CONTACT WITH THE SOIL.

WATER TO A DEPTH OF 4" AS NEEDED. WATER WELL AS SOON AS THE SOD IS Laid.

HOW WHEN THE SOD IS ESTABLISHED. TYPICALLY IN 2-3 WEEKS SET THE NOZZLE AT 2 TO 3 INCHES HIGH.

B) TROUBLESHOOTING:
1. CONSULT WITH A QUALIFIED DESIGN PROFESSIONAL IF ANY OF THE FOLLOWING OCCUR:
   a. VARIATION IN TOPOGRAPHY ON SITE INDICATE THE SODDING MATERIALS WILL NOT FUNCTION AS INTENDED. CHANGES IN PLAN MAY BE NEEDED.
   b. DESIGN SPECIFICATIONS FOR SODDING VARIETY CANNOT BE MET OR IRRIGATION IS NOT POSSIBLE. SUBSTITUTION OR SEEDING MAY BE REQUIRED.
   c. UNAPPROVED SUBSTITUTIONS COULD RESULT IN EROSION OR SOCKING FAILURE.
2. COMMON PROBLEMS:
   a. SOD Laid ON POORLY PREPARED SOIL OR UNSTABLE SURFACE DIES BECAUSE IT IS UNABLE TO ROOT. REMOVE DEAD SOD, PREPARE SURFACE AND RESOIL.
   b. SOD NOT ADEQUATELY WATERED AFTER INSTALLATION DIES BECAUSE ROOT DIEBACK, GRASS TO TOP SOIL RapidLY, AND DRYING OUT. IRRIGATE SOD AND UNDERLYING SOIL TO A DEPTH OF 4 INCHES AND KEEP MOIST UNTIL ROOTS ARE ESTABLISHED.
   c. SOD NOT CHANGED PROPERLY IS LOOSENED BY RAIN. REPLACE DAMAGED AREAS AND SOD.
   d. SLOW GROWTH DUE TO LACK OF NITROGEN RESULTS IN WEAKING OF LEAF BLADES. REFERTILIZE SOD, BUT AVOID FERTILIZING COOL SEASON GRASSES FROM LATE MAY THROUGH JULY.

C) MAINTENANCE AND INSPECTION:
1. THE SODDED AREA SHALL BE THOROUGHLY WATERED DAILY FOR A PERIOD OF 15 DAYS AFTER PLACING EXCEPT WHEN THOROUGHLY WATERED DURING THE WARMER MONTHS. ANY PORTION OF THE SOD THAT IS NOT IN GOOD GROWING CONDITION FOLLOWING THE FIRST FULL GROWING SEASON (SPRING TO FALL), SHALL BE REPLACED WITH FRESH LIVE SOD.

SOURCE: MODIFIED FROM VA. DOR. 1922

AMERICAN PUBLIC WORKS ASSOCIATION
KANSAS CITY
METROPOLITAN CHAPTER

SODDING

STANDARD DRAWING
REVISION: 07-07-01
ADAPTED

KEVIN B. MUELLER
APWA METROPOLITAN CHAPTER SECRETARY/RECORD
2005-2006
SODDED WATERWAYS

A) INSTALLATION:

1. Lay sod in a staggered pattern but the strips tightly against each other. Do not leave spaces and do not overlap.

2. Care should be taken to prepare the soil adequately in accordance with the sodding specifications in ESC-02.

3. Sod strips in waterways shall be laid perpendicular to the direction of flow. Care should be taken to butt ends of strips tightly.

4. After rolling or tampering, sod shall be pegged or stapled to resist washout during the establishment period. Jute mesh or other netting may be pegged over the sod for extra protection in critical areas.

5. All other sodding specifications shall be adhered to when sodding a waterway.

B) TROUBLESHOOTING:

1. Consult with a qualified design professional if any of the following occur:
   a. Variation in topography or site indicate the sodding materials will not function as intended; changes in plan may be needed.
   b. Design specifications for sod variety cannot be met or irrigation is not possible; substitution or seeding may be required. Unapproved substitutions could result in erosion or sodding failure.

2. Common problems:
   a. Sod laid on poorly prepared soil or unsuitable surface dies because it is unable to root — remove dead sod, prepare surface, and resod.
   b. Sod not adequately irrigated after installation causes root overexcess grass to not root rapidly, and drying out — irrigate sod and underlying soil to the depth of 6 inches and keep moist until roots are established.
   c. Sod not anchored properly is loosened by runoff — replace damaged areas and anchor sod.
   d. Slow growth due to lack of nitrogen causes yellowing of leaf blades — reapply sod but avoid fertilizing cool season grasses from late May through July.

C) MAINTENANCE & INSPECTION:

1. Keep sod moist until it is fully rooted.

2. Mow to a height of 2 to 3 inches after sod is well-rooted. In 2 to 3 weeks. Do not remove more than 1/3 of the leaf blades in any mowing.

3. Permanently, fine turf areas require yearly fertilization. Fertilize warm-season grass in late spring to early summer. Cool-season grass in late winter and again in early fall.

SOURCE: MODIFIED FROM KA SCR, 1992

AMERICAN PUBLIC WORKS ASSOCIATION
KANSAS CITY METROPOLITAN CHAPTER
SODDED WATERWAYS

STANDARD SURVEYED NOS. 31-50 ADOPTED
EROSION CONTROL BLANKET NOTES (1 OF 2):

A) SITE PREPARATION:
After site has been shaped and graded, prepare a friable seedbed relatively free from clogs and rocks more than 1 1/2 inches in diameter and any foreign material that will prevent uniform contact of the protective covering with the soil surface.

B) PLANTING:
Line, fertilize, and seed in accordance with seed box or planting plan. When using wire mesh on a seeded area, apply approximately one half the seed after laying the mat. The protective covering can be laid over sprigged areas where small grass plants have been inserted into the soil, where ground covers are to be planted, lay the protective covering first and then plant through the material as per planting plan.

C) LAYING AND STAPLING:
If instructions have been followed, all needed check slots will have been installed, and the protective covering will be laid on a friable seedbed free from clogs, rocks, roots, etc. that might impede good contact.

1. Start laying the protective covering from the top of the channel, on slope and unroll down-grade. Allow to lay loosely on soil, do not stretch.
2. Upslope ends of the blanket should be buried in an anchor slot no less than 6 inches deep. Tamper earth firmly over the material. When top is relatively flat, extend blanket about 45 inches away from slope.
3. Staple the material at a minimum of every 12 inches across the top end.
4. Edges of the material shall be stapled every 3 feet. Where multiple widths are laid side by side, the adjacent edges shall be overlapped a minimum of 6 inches and stapled together.
5. Staples shall be placed down the center, stapled with the edges at 2-foot intervals.

D) TROUBLESHOOTING:
Consult with a qualified design professional, if any of the following occur:
1. Movement of the blanket or erosion under the blanket is observed.
2. Variations in topography on site indicate erosion control mat will not function as intended; changes in plan may be needed, or a blanket with a shorter or longer life may be needed.
3. Design specifications for seed variety, seeding rates, or erosion control materials cannot be met; substitution may be required. Unapproved substitutions could result in failure to establish vegetation.

E) MAINTENANCE & INSPECTION:
Inspect controls after each rain event of 1/2 inch or greater, and every 7 days until vegetation is established. For erosion or undermining beneath the netting, blankets, or mats—If any area shows erosion, pull back that portion of the material, add soil, tamp down, and reseed; resecure the material in place. If netting, blankets, or mats become dislodged or damaged, repair or replace and resecure immediately.

AMERICAN PUBLIC WORKS ASSOCIATION
KANSAS CITY METROPOLITAN CHAPTER
EROSION CONTROL BLANKET
SHEET 1 OF 2
**Erosion Control Blanket Notes (2 of 2):**

**F) Staples:**
Staples for anchoring blanket shall be no. 11-gauge wire or heavier. Their length shall be a minimum of 6 inches. A larger staple with a length of up to 12 inches shall be used on loose, sandy, or unstable soils.

**G) Joining Protective Coverings:**
Overlap the end of the previous roll a minimum of 6 inches and staple. Staple across the end of the roll just below the anchor slot and across the material every 6 inches.

**H) Terminal End:**
At the point at which the material is discontinued, or where the protective covering meets a structure of some type, staple a minimum of every 12 inches.

**I) Final Check:**
These installation criteria must be adhered to:
1. All disturbed areas are seeded.
2. Protective blanket is in uniform contact with the soil.
3. All lap joints are secure.
4. All staples are driven flush with the ground.

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**NOTES:**
- Junction: Overlap top blanket 6 inches minimum and staple every 6 inches across.
- Staple formed from no. 11 steel wire.
- Min. 6" staple length for sandy soil.
- Min. 6" staple length for other soil.
- Approximate 200 staples are required per 100 sq. yds. of material roll, anchor slots, junction slots, and check slots to be buried 6" to 12" deep.
TURF REINFORCEMENT MAT SLOPE INSTALLATION

NOTES:
1. SOIL STABILIZATION SHOULD BE INSTALLED VERTICALLY DOWNSLOPE FOR BEST RESULTS.
2. SLOPE SURFACE SHALL BE SMOOTH AND FREE OF ROCKS, LUMPS OF DIRT, GRASS, AND STICKS. MAT SHALL BE PLACED FLAT ON SURFACE FOR PROPER SOIL CONTACT.

USE WOOD STAKES OR WIRE STAPLES

FILL SLOPE SECTION
NOT TO SCALE
TRENCH INTO BERM AND PROGRESS DOWNSLOPE

ANCHOR SLOT
NOT TO SCALE

TOE
MAINTAIN SLOPE ANGLE

Turf reinforcement mat - Polypropylene, Non-woven, Needle-Punched Geotextile Filter Cloth (Behind Turf Reinforcement Mat)

SLOPE LINING (WET SLOPE)
NOT TO SCALE

SLOPE LINING (DRY SLOPE)
NOT TO SCALE

TURF REINFORCEMENT MAT SLOPE INSTALLATION NOTES:

A) TURF REINFORCEMENT MAT:

1. The majority of these products provide a three dimensional geotextile matrix of nylon, polyethylene, or randomly oriented monofilaments, forming a mat. These products contain ultraviolet (UV) inhibiting stabilizers, added to the compounds to ensure endurance, and provide "permanent root reinforcement." The three dimensional feature creates an open space which is allowed to fill with soil. The roots of the grass plant become established within the mat itself, forming a synergistic root and mat system. As the grass becomes established, the mat actually "reinforces" each other, preventing movement or damage to the soil. Allowable velocities are increased considerably over natural turf stands.

Selection of the appropriate matting materials along with proper installation become critical factors in the success of this practice. Consultation with the supplier or the manufacturer and thorough evaluation of performance data to ensure proper selection of a soil stabilization matting are also essential.

B) INSTALLATION REQUIREMENTS:

1. SITE PREPARATION:
   After site has been shaped and graded, prepare a friable seeded relatively free of clods and rocks more than 1-inch in diameter and any foreign material that will prevent contact of the soil stabilization mat with the soil surface. If necessary, redirect any runoff away from the ditch or slope during installation.

2. PLANTING:
   Line, fertilize, and seed in accordance with the approved plan, paying special attention to the plant selection chosen for the matted area. If the area has been seeded prior to installing the mat, reseed all areas disturbed during installation.

3. LAYING AND SECURING:
   Similar to installing other erosion control blankets, but plans and authorizing authority's requirements or manufacturer's recommendations must be followed as detailed. The key to achieving desired performance is dependent upon proper installation.

4. SECURING THE MATERIAL AND MINING BLANKETS:
   Product specifications vary. Upstream and downstream terminal slots, new roll overlaps, and multiple width installations differ by product and manufacturer.

5. FINAL CHECK:
   Ensure that all installation criteria are completed:
   a. All disturbed areas are seeded.
   b. Soil stabilization blanket is in uniform contact with the soil.
   c. All required slots and lapped joints are in place.
   d. The material is properly anchored.
TURF REINFORCEMENT MAT CHANNEL INSTALLATION

USE WOOD STAKES OR WIRE STAPLES

SOIL STABILIZATION BLANKET SHALL BE USED IN CONJUNCTION WITH RIPRAP AT OUTLET END OF PIPE

SIDE LAP STAPLING:
OVERLAP MATERIAL 6 INCHES AND STAPLE EVERY 3 INCHES ACROSS

END ANCHORING:
STAPLE EVERY 3 INCHES ALONG EDGE

ANCHOR SLOT DETAIL
NOT TO SCALE

TURF REINFORCEMENT MAT CHANNEL INSTALLATION NOTES:

A) TURF REINFORCEMENT MAT:

1. THE MAJORITY OF THESE PRODUCTS PROVIDE A THREE DIMENSIONAL GEOMATRIX OF NYLON, POLYETHYLENE, OR RANDOMLY ORIENTED MONOFILAMENTS TO FORM A MAT. THESE PRODUCTS CONTAIN ULTRAVIOLET (UV) INHIBITING STABILIZERS ADDED TO THE COMPOUNDS TO ENSURE ENDURANCE AND PROVIDE PERMANENT ROOT REINFORCEMENT. THE THREE DIMENSIONAL FEATURE CREATES AN OPEN SPACE WHICH IS ALLOWED TO FILL WITH SOIL. THE ROOTS OF THE GRASS BECOME ESTABLISHED WITHIN THE MAT ITSELF, FORMING A SYNERGISTIC ROOT AND MAT SYSTEM. AS THE GRASS BECOMES ESTABLISHED, THE TWO ACTUALLY REINFORCE EACH OTHER PREVENTING MOVEMENT OF THE SOIL. ALLOWABLE VELOCITIES ARE INCREASED CONSIDERABLY OVER NATURAL TURF STANDS.

SELECTION OF THE APPROPRIATE MATTING MATERIALS ALONG WITH PROPER INSTALLATION BECOME CRITICAL FACTORS IN THE SUCCESS OF THIS PRACTICE. CONSULTATION WITH THE SUPPLIER OR THE MANUFACTURER AND THOROUGH EVALUATION OF PERFORMANCE DATA TO ENSURE PROPER SELECTION OF A SOIL STABILIZATION MATTING ARE ALSO ESSENTIAL.

B) INSTALLATION REQUIREMENTS:

1. SITE PREPARATION:
AFTER SITE HAS BEEN SHAPED AND GRADED, PREPARE A FRIABLE SEEDED RELATIVELY FREE OF CLAYS AND ROCKS MORE THAN 1-INCH IN DIAMETER AND ANY FOREIGN MATERIAL THAT WILL PREVENT CONTACT OF THE SOIL STABILIZATION MAT WITH THE SOIL SURFACE. IF NECESSARY, REDIRECT ANY RUNOFF AWAY FROM THE DITCH OR SLOPE DURING INSTALLATION.

2. PLANTING:
LINE, FERTILIZE, AND SEED IN ACCORDANCE WITH THE APPROVED PLAN, PAYING SPECIAL ATTENTION TO THE PLANT SELECTION CHOOSEN FOR THE MATTED AREA. IF THE AREA HAS BEEN SEEDED PRIOR TO INSTALLING THE MAT, RESEED ALL AREAS DISTURBED DURING INSTALLATION.

3. LAYING AND SECURING:
SIMILAR TO INSTALLING OTHER EROSION CONTROL BLANKETS, BUT PLAN APPROVING AUTHORITY'S REQUIREMENTS OR MANUFACTURER'S RECOMMENDATIONS MUST BE FOLLOWED AS DETAILED. THE KEY TO ACHIEVING DESIRED PERFORMANCE IS DEPENDENT UPON PROPER INSTALLATION.

4. SECURING THE MATERIAL AND JOINING BLANKETS:
PRODUCT SPECIFICATIONS VARY. UPSTREAM AND DOWNSTREAM TERMINAL SLOTS, NEW ROLL OVERLAPS, AND MULTIPLE WIDTH INSTALLATIONS DIFFER BY PRODUCT AND MANUFACTURER.

5. FINAL CHECK:
THESE INSTALLATION CRITERIA MUST BE COMPLETED:

a. ALL DISTURBED AREAS ARE SEEDED.
b. SOIL STABILIZATION BLANKET IS IN UNIFORM CONTACT WITH THE SOIL
c. ALL REQUIRED SLOTS AND LAPPED JOINTS ARE IN PLACE.
d. THE MATERIAL IS PROPERLY ANCHORED.

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KANSAS CITY
METROPOLITAN CITY CHAPTER
TURF REINFORCEMENT MAT CHANNEL INSTALLATION
STAKES, STAPLES, AND PINS

1. STAKE
SEE NOTE 1

2. STAPLE
SEE NOTE 2

3. PIN
SEE NOTE 3

STAKES, STAPLES, AND PINS
FOR INSTALLATION OF
ROLLED EROSION CONTROL PRODUCTS
NOT TO SCALE

STAKES, STAPLES, AND PINS NOTES:

GENERAL NOTES:
1. STAKES SHALL BE 1 x 4 TRIANGULAR SURVEY STAKES A MINIMUM OF 10" IN LONG.

2. STAPLES SHALL BE 11 GAUGE STEEL, A MINIMUM OF 1" WIDE BY 6" IN LONG. A 2" x 6" STAPLE MAY BE REQUIRED IN CERTAIN SOIL CONDITIONS.

3. STEEL PINS SHALL BE 3/16 DIAMETER BY 18" IN LONG WITH A 2" DIAMETER WASHER ON TOP. (SEE ILLUSTRATION.)

4. ANCHORING METHODS AND RECOMMENDATIONS VARY BY MANUFACTURERS. THE EXPECTATION OF HIGH VELOCITIES SHOULD DICTATE THE USE OF MORE SUBSTANTIAL ANCHORING.

SOURCE: ADAPTED FROM WA DOR, 1993
SEDIMENT FENCE NOTES:

A) INSTALLATION:

1. The height of sediment fence shall be a minimum of 15 inches above the original ground surface and shall not exceed 34 inches above the ground surface.

2. The fabric shall be purchased in a continuous roll, cut to the length of the barrier to avoid the use of joints. When joints are unavoidable, filter cloth shall be securely spliced together only at support posts, with a maximum 6-inch overlap.

3. Dig a trench at least 8 inches deep and 4 inches wide along the fence alignment.

4. Drive posts at least 24 inches into the ground on the downslope side of the trench. Space posts a maximum of 6 feet apart.

5. Extra-strength sediment fence fabric shall be used. Posts for this type of fabric shall be placed a maximum of 6 feet apart. The sediment fabric shall be fastened securely to the upslope side of the posts using a minimum of one inch long, heavy-duty wire staples on the posts, and eight inches of the fabric shall be extended into the trench. The fabric shall not be stapled to existing trees.

6. Place the bottom 1 foot of fabric in the maximum of 8-12-inch deep trench, leaving toward the upslope side. Backfill with compacted earth or gravel.

7. If a sediment fence is to be constructed across a grade line or switch, it must be of sufficient length to eliminate erosion. The plan configuration shall resemble an arc or horseshoe, placed on a contour, with the ends oriented upslope. Extra-strength sediment fabric shall be used with a maximum 5-foot spacing of posts.

8. To reduce maintenance, excavate a shallow sediment collection area in the upslope side of the fence. Promote good access in areas of heavy sedimentation for collection and maintenance.

9. Sediment fences shall be removed when they have served their useful purpose, but not before the upslope area has been permanently stabilized.

B) TROUBLESHOOTING:

1. Determine the exact location of underground utilities, before fence installation so utilities are not disturbed.

2. Grade alignment of fence as needed to provide a proper, nearly level area upstream of fence to allow sediment collection area.

C) INSPECTION MAINTENANCE:

1. Inspect sediment fences at least once a week, and after each downpour. Make any required repairs immediately.

2. Should the fabric of a sediment fence collapse, tear, decompose, or become ineffective, replace it promptly.

3. Remove sediment deposits as necessary to provide adequate storage volume for the next rain and to reduce pressure on the fence. Avoid damaging or undermining the fence during cleaning. Sediment accumulation should not exceed 1/2 the height of the fence.

4. Remove all debris materials and unstable sediment deposits, and bring the area to grade and stabilize it after the contributing drainage area has been properly and completely stabilized.
SEDIMENT FENCE INSTALLATION Slicing Method

NOTES:
1. LIMIT PONDING HEIGHT TO 24".
2. ATTACH FABRIC TO UPSTREAM SIDE OF POST.
3. DRIVE OVER EACH SIDE OF SEDIMENT FENCE 2 TO 4 TIMES WITH DEVICE EXERTING 60 PSI OR GREATER. AFTER MATERIAL IS SLICED INTO THE GROUND.
4. SPACE POSTS A MAX OF 7' ON OPEN RUNS AND 4' ON POOLING AREAS.
5. SINK POSTS AS FAR BELOW GROUND AS FABRIC ABOVE GROUND.

NOTE: VIBRATORY FLOW IS NOT ACCEPTABLE BECAUSE OF HORIZONTAL COMPACTION.
Super Sediment Fence

1. Excavate a 6"x6" trench.
2. Set the metal T-posts or fence posts on the downslope side of the trench. Secure wire fencing to the posts.
3. Attach the geotextile fabric to the wire fence and extend it into and around the bottom of the trench.
4. Backfill and compact the excavated soil.

Super Sediment Fence Notes:

A) Construction Specifications:

1. Fencing shall be 42-inches in height.
2. Wire fence shall be fastened securely to the fence posts with wire ties and staples. The lower tension wire, brace and truss rods, drive anchors, and post caps are not required except on the ends of the fence.
3. Sediment fence shall be fastened securely to the wire fence with ties spaced every 24 inches at the top and mid-section.
4. Sediment fence and wire shall be embedded a minimum of 6-inches into the ground.
5. When two sections of geotextile fabric abut each other, they shall be overlapped by 6-inches and folded.
6. Wire fence will be between 9 and 14 gauge and shall have a maximum mesh spacing of 6-inches.
7. Sediment fence shall meet the following requirements for geotextile class D: additional specifications are found in ASTM 6461.

Sediment Fence Requirements:

- Tension Strength: 50 lb/in or more
- Tension Modulus: 30 lb/in or more
- Flow Rate: 0.1 gpm per minute or less
- Filtering Efficiency: 75% or more

B) Installation:

1. The height of a sediment fence shall be a minimum of 15 inches above the original ground surface and shall not exceed 34 inches above ground surface.
2. The filter fabric shall be purchased in a continuous roll and cut to the length of the barrier to avoid the use of joints. When joints are unavoidable, filter cloth shall be spliced together only at a support post, with a maximum 6-inch overlap, and secured.
4. A trench shall be excavated approximately 4 inches wide and 8 inches deep on the upslope side of the proposed location of the fence.
5. When wire support is used, standard-strength filter cloth may be used. Posts for this type of installation shall be placed a maximum of 10 feet apart. The wire mesh fence must be fastened securely to the upslope side of the posts using heavy duty wire staples at least 1 inch long, tie wires, or hog rings. The wire shall extend into the trench a minimum of 2 inches and shall not extend more than 34 inches above the original ground surface. The standard-strength fabric shall be stapled or wired to the fence, and 6 inches of the fabric shall be extended into the trench. The fabric shall not be stapled to existing trees. If a sediment fence is to be constructed across a ditch line or gully, it must be of sufficient length to eliminate endflow, and the plan configuration shall resemble an arc or horseshoe with the ends oriented upslope. Extra-strength filter fabric shall be used for this application with a maximum 3-foot spacing of posts.
6. This application with a maximum 3-foot spacing of posts.
7. The 4 inch by 6 inch trench shall be backfilled and the soil compacted over the filter fabric.
8. Sediment fences shall be removed when they have served their useful purpose, but not before the upslope area has been permanently stabilized. Sediment accumulation should not exceed 1/2 the height of the fence.

C) Inspection and Maintenance:

1. Inspect sediment fences at least once a week and after each rainfall. Make any required repairs immediately.
2. Should the fabric of a sediment fence collapse, tear, decompose, or become ineffective, replace it promptly.
3. Maintenance shall be performed as needed, and sediment build-ups removed when bulges develop in the sediment fence or when sediment reaches 50% of the fence height.
4. Avoid damaging or undermining the fence during cleanup.
5. Remove all fencing materials and unstable sediment deposits, and bring the area to grade and stabilize it after the contributing drainage area has been properly stabilized.

American Public Works Association
Kansas City Metropolitan Chapter

Super Sediment Fence

Source: Modified from WA, DCR, 1992
**STRAW BALES BARRIER**

**STRAW BALES BARRIER NOTES:**

A) INSTALLATION:

1. Excavate a trench at least 4 inches deep, a bale's width, and long enough that the end bales are somewhat upslope of the sediment pool.

2. Place each bale end to end in the trench so the bindings are oriented around the sides rather than top to bottom.

3. Anchor the bales by driving two 36-inch long, 2x2-inch hardwood stakes through each bale until nearly flush with the top. Drive the first stake toward the previously laid bale to force the bales together.

4. Wedge loose straw into any gaps between the bales to prevent sediment-laden water from leaving through.

5. Backfill and compact the excavated soil against the bales to ground level on the downslope side and to 4 inches above ground level on the upslope side.

B) CONSTRUCTION SPECIFICATIONS:

1. Only use as perimeter control for less than one acre of runoff area.

2. Determine exact location of underground utilities.

3. Grade alignment of barrier as needed to provide broad, nearly level area upstream of barrier.

C) INSPECTION AND MAINTENANCE:

1. Inspect straw bale barriers after each storm event and remove any sediment deposits promptly, taking care not to undermine the entrenched bales.

2. Inspect periodically for deterioration or damage from construction activities. Replace damaged bales immediately.

3. After the contributing drainage area has been stabilized, remove all straw bales and sediment, bring the disturbed area to grade, and stabilize.
COMPOST BERM MULCH NOTES:

A) GENERAL NOTES:

1. THE SEDIMENT CONTROL BERM SHALL BE PLACED UNCOMPACTED IN A WIDEBOW AT LOCATIONS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

2. PARALLEL TO THE BASE OF THE SLOPE, OR AROUND THE PERIMETER OF OTHER AFFECTED AREAS, CONSTRUCT A 1 TO 1.5 FOOT HIGH BY 2.5 TO 3 FOOT WIDE BERM, FOR MAXIMUM WATER TREATMENT ABILITY OR FOR STEEP SLOPES, CONSTRUCT A 1.5 TO 2 FOOT HIGH TRAPEZIODAL BERM THAT IS APPROXIMATELY 2 TO 3 FOOT WIDE AT THE TOP AND A MINIMUM OF 4 FEET WIDE AT THE BASE. IN EXTREME CONDITIONS, OR WHERE SPECIFIED BY THE ENGINEER, A SECOND BERM SHALL BE CONSTRUCTED AT THE TOP OF THE SLOPE. ENGINEER SHALL SPECIFY BERM REQUIREMENTS.

3. IF BERM IS TO BE LEFT AS PERMANENT OR PART OF THE NATURAL LANDSCAPE, THE COMPOST BERM MAY BE SEEDED DURING APPLICATION FOR PERMANENT VEGETATION. THE ENGINEER/LANDSCAPE ARCHITECT SHALL SPECIFY SEED REQUIREMENTS.

4. DO NOT USE COMPOST BERM IN ANY MUNICIPAL CHANNELS.
**ROCK CHECK DAM NOTES:**

**A) CONSTRUCTION SPECIFICATIONS & INSTALLATION:**

1. The drainage area of the ditch or swale being protected shall not exceed 2 acres when a coarse aggregate is used alone and shall not exceed 10 acres when a combination of class 1 riprap and coarse aggregate is used. An effort should be made to extend the stone to the top of channel banks.

2. The maximum height of the dam shall be 3 feet. The center of the check dam is at the same elevation as the top of the outer edges.

3. For added stability, the base of the check dam can be keyed into the soil approximately 6 inches.

4. The maximum spacing between the dams should be such that the toe of the upstream dam is at the same elevation as the top of the downstream dam.

5. Stone should be placed according to the configuration to the left. Hand or mechanical placement will be necessary to achieve complete coverage of the ditch or swale and to ensure that the center of the dam is lower than the edges.

6. Geotextile may be used under the stone to provide a stable foundation and to facilitate removal of the stone.

**C) INSPECTION AND MAINTENANCE:**

1. Check dams should be checked for sediment accumulation after each storm event of 1/2-inch or greater. Sediment should be removed when it reaches one half of the original height of the dam.

2. Regular inspections should be made to ensure that the center of the dam is lower than the edges. Erosion caused by high flows around the edges of the dam should be corrected.

**D) REMOVAL OF PRACTICE:**

Unless they are to be permanent, check dams must be removed when their useful life has been completed. In temporary ditches and swales, check dams should be removed and the ditch filled when they are no longer needed. In permanent structures, check dams should be removed when a permanent lining can be installed. In the case of grass-lined ditches, check dam should be removed when the grass has matured sufficiently to protect the ditch or swale. The area beneath the check dams should be seeded and mulched immediately after they are removed. The use of filter cloth underneath the stone will make removal of the stone easier.
**TRIANGULAR SILT DIKE™ NOTES:**

**A) GENERAL NOTES:**

1. TRIANGULAR SILT DIKE™ SHALL BE TRIANGULAR SHAPE HAVING A HEIGHT OF AT LEAST EIGHT TO TEN INCHES IN THE CENTER WITH EQUAL SIDES AND A SIXTEEN- TO TWENTY- INCH BASE. THE TRIANGULAR SHAPE DIKES MATERIAL SHALL BE URETHANE FOAM. THE OUTER COVER SHALL BE A WOVEN GEOTEXTILE FABRIC PLACED AROUND THE INNER MATERIAL AND ALLOWED TO EXTEND BEYOND BOTH SIDES OF THE TRIANGLE TWO TO THREE FEET.

2. LENGTH SHALL BE THREE TO SEVEN FEET. STANDARD LENGTH WILL BE SEVEN UNLESS OTHERWISE INDICATED ON THE PLANS.

3. THE DIKES SHALL BE ATTACHED TO THE GROUND BY WIRE STAPLES. THE STAPLES SHALL BE NO. 16 GAUGE WIRE AND BE AT LEAST SIX TO EIGHT INCHES LONG. STAPLES SHALL BE PLACED AS SHOWN IN THE INSTALLATION DETAIL.

**B) INSPECTION AND MAINTENANCE:**

1. THE CONTRACTOR SHALL INSPECT ALL DIKES AFTER EACH RAINFALL EVENT OF 1/2 INCH OR GREATER. ANY DEFICIENCIES OR DAMAGE SHALL BE REPAIRED BY THE CONTRACTOR.

2. ACCUMULATED SEDIMENT OR DEBRIS SHALL BE REMOVED AND RELOCATED AS DIRECTED BY THE ENGINEER. IF THE DIKES ARE DAMAGED OR INADVERTENTLY MOVED DURING THE SEDIMENT REMOVAL PROCESS, THE CONTRACTOR SHALL RE-ESTABLISH CONTINUITY.
GEO-RIDGE® NOTES:

A) GEO-RIDGE® INSTALLATION:
1. PREPARE THE CHANNEL BY FORMING THE SHAPE AND GRADE OF THE CHANNEL AND COMPACTION OF THE SUBGRADE.
2. APPLY SOIL ADDITIVES SUCH AS FERTILIZER AND LIME, AND SEED AS REQUIRED.
3. SURVEY LOCATIONS OF DITCH CHECKS ALONG THE LENGTH OF CHANNEL.
4. INSTALL EROSION CONTROL BLANKETS.
   a. FOR FULL CHANNEL LINING, FOLLOW MANUFACTURER'S RECOMMENDED INSTALLATION PROCEDURES. LEAVE A 4" FLAP OF EROSION CONTROL BLANKET TO FOLD OVER THE UPSTREAM LEG OF THE GEO-RIDGE®.
   b. FOR EROSION CONTROL BLANKETS UNDER THE GEO-RIDGE® ONLY, USE A COCONUT BLANKET AS A MINIMUM GRADE OF EROSION CONTROL BLANKET, INSTALL A 3.3'-FOOT-HIGH EROSION CONTROL BLANKET PERPENDICULAR TO THE DIRECTION OF FLOW, CENTERED UNDER THE GEO-RIDGE®. ALLOW 4" BLACK ACROSS EROSION CONTROL BLANKET WIDTH FOR FOLDING OVER THE UPSTREAM FOOT OF THE GEO-RIDGE® BERM. PROVIDE A 6" X 6" TRENCH AT THE UPSTREAM EDGE OF THE EROSION CONTROL BLANKET. STAPLE THE EROSION CONTROL BLANKET ONTO BOTTOM OF THE TRENCH WITH MINIMUM 6" STAPLES AT 20" SPACING ON CENTER. RE-COMPACT THE SOIL INTO THE TRENCH.
5. PLACE GEO-RIDGE® BERRYS PERPENDICULAR TO THE DIRECTION OF FLOW OVERLAP PANELS BY MINIMUM 2", CUT A SLOT IN THE CREST OF THE OVERLAPPING BERM TO ALLOW CONTACT BETWEEN THE FOOT OF THE BERM AND THE SOIL.
6. SECURE BERRYS WITH 10" PINS AND 1.5" WASHERS THROUGH THE FOLDED EROSION CONTROL BLANKET AND THE FOOT OF THE UNIT. THE PIN SPACING ACROSS THE WIDTH OF THE PANEL SHOULD BE 18.7" ON CENTER FOR THE UPSTREAM LEG AND 39.6" ON CENTER FOR THE DOWNSTREAM LEG.

B) INSPECTION AND MAINTENANCE:
1. THE CONTRACTOR SHALL INSPECT ALL GEO-RIDGE® AFTER EACH RAIN EVENT OF 1/2 INCH OR GREATER. ANY DEFICIENCIES OR DAMAGE SHALL BE REPAIRED BY THE CONTRACTOR.
2. ACCUMULATED SEDIMENT OR DEBRIS SHALL BE REMOVED AND RELOCATED AS DIRECTED BY THE ENGINEER. IF THE GEO-RIDGE® IS DAMAGED OR INADVERTENTLY MOVED DURING THE SEDIMENT REMOVAL PROCESS, THE CONTRACTOR SHALL RE-ESTABLISH CONTINUITY.
SILT SAVER® NOTES:

A) CONSTRUCTION SEQUENCE FOR SILT SAVER®:

1. Excavate approximately 4" to 6" below the top of the inlet structure.
2. Place the frame onto the inlet structure; ensure the frame covers the structure completely.
3. Place the fabric over the frame.
4. Fill the pockets with soil, #57 gravel, or equivalent; the pockets should be completely filled to ensure a good seal between the ground and the inlet structure.
5. Backfill around the frame and fabric assembly is not required to complete installation; however, backfilling may be necessary to complete excavation requirements for the site.

B) MAINTENANCE REQUIREMENTS FOR SILT SAVER® FRAME AND FABRIC:

1. Maintenance is required when eroded soils reach a point of 65% of the total height of the frame or approximately 7 to 9 inches of the grey fabric material is showing.
2. Remove the impacted material by hand or machine. Do not damage the frame or fabric.
3. Brush, sweep, or wash fabric and inspect for any cuts or abrasions; replace fabric as necessary.
4. Inspect frame for any stress or damage, and replace as necessary.
5. Refill fabric pockets and backfill as required by job site conditions.
**SEDIMENT FENCE DROP INLET PROTECTION NOTES:**

**A) CONSTRUCTION SPECIFICATIONS:**

1. SEDIMENT FENCE SHALL CONFORM TO THE CONSTRUCTION SPECIFICATIONS FOR EXTRA STRENGTH FOUND IN THE TABLE BELOW AND SHALL BE CUT FROM A CONTINUOUS ROLL TO AVOID JOINTS.

**PHYSICAL PROPERTIES OF FABRIC IN SEDIMENT FENCE:**

<table>
<thead>
<tr>
<th>PHYSICAL PROPERTY</th>
<th>TEST</th>
<th>REQUIREMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filtration Efficiency</td>
<td>ASTM 3141</td>
<td>75%</td>
</tr>
<tr>
<td>Tensile Strength at 20% Elongation (Max.)</td>
<td>ASTM D 4832</td>
<td>Extra Strength = 50 LBS./LINEAR FT.</td>
</tr>
<tr>
<td></td>
<td>AASHTO M288-96</td>
<td></td>
</tr>
<tr>
<td>Flow Rate</td>
<td>ASTM 5141</td>
<td>0.2 GALL/LIN/FT./MIN.**</td>
</tr>
<tr>
<td>UV Radiation Stability X</td>
<td>ASTM D 4335</td>
<td>90%</td>
</tr>
</tbody>
</table>

* Requirements reduced by 50% after six months of installation.
** High porosity fabric made by Better Sifted for this device.

2. For stakes, use 2x4 wood or equivalent metal with a minimum length of 3 feet.

3. Space stakes evenly around the perimeter of the inlet a maximum of 3 feet apart, and securely drive them into the ground, approximately 18 inches deep.

4. To provide needed stability to the installation, frame with 2x4 wood strips around the crest of the overflow area at a maximum of 1.5 feet above the drop inlet crest.

5. Place the bottom 1/2 inches of the fabric in a trench and backfill the trench with 12-inch of compacted soil.

6. Fasten fabric securely by staples, or wire it to the stakes and frame. Joints must be overlapped to the next stake.

7. It may be necessary to build a temporary dike on the downslope side of the structure to prevent bypass flow.

**B) INSPECTION AND MAINTENANCE:**

1. The structure shall be inspected after each rain event of 1/2 inch or greater and repairs made as needed.

2. Sediment shall be removed and the trap restored to its original dimensions when the sediment has accumulated to one half the design depth of the trap. Removed sediment shall be disposed of in a suitable area and in such a manner that it will not erode.

3. Structures shall be removed and the area stabilized when the remaining drainage area has been properly stabilized.
**Gravel and Wire Mesh Drop Inlet Sediment Trap Notes:**

**A) General Notes:**

1. Wire mesh shall be laid over the drop inlet so that the wire extends a minimum of 1 foot beyond each side of the inlet structure. Wire mesh with 1/2-inch openings shall be used. If more than one strip of mesh is necessary, the strips shall be overlapped.

2. Coarse aggregate shall be placed over the wire mesh. The depth of stone shall be at least 12-inches over the entire inlet opening. The stone shall extend beyond the inlet opening at least 18-inches on all sides.

3. If the stone becomes clogged with sediment so that it no longer adequately performs its function, the stones must be pulled away from the inlet and cleaned or replaced.

**B) Inspection and Maintenance:**

1. The structure shall be inspected after each rain event of 1/2 inch or greater and repairs made as needed.

2. Sediment shall be removed and the trap restored to its original dimensions when the sediment has accumulated to one half the design depth of the trap removed. Sediment shall be deposited in a suitable area and in such a manner that it will not erode.

3. Structures shall be removed and the area stabilized when the remaining drainage area has been properly stabilized.

*Note:*
- Use clean gravel, 1/2" diameter.
**BLOCK AND GRAVEL DROP INLET SEDIMENT TRAP NOTES:**

**A) GENERAL NOTES:**

1. Place concrete blocks lengthwise on their sides in a single row around the perimeter of the inlet with the ends of the adjacent blocks abutting. The height of the barrier can be varied, depending on the design needs, by stacking combinations of 4-inch, 8-inch, and 12-inch blocks. The barrier of blocks shall be at least 12 inches high and no greater than 24 inches high.

2. Wire mesh or netting shall be placed over the outside vertical face of the concrete blocks to prevent stone from being washed through the holes in the blocks. Wire mesh with 1/2-inch openings shall be used.

3. Stone shall be piled against the wire to the top of the block barrier.

4. If the stone becomes clogged with sediment so that it no longer adequately performs its function, the stone must be pulled away from the blocks and cleaned or replaced.

**B) INSPECTION AND MAINTENANCE:**

1. The structure shall be inspected after each rain event of 1/2 inch or greater and repairs made as needed.

2. Sediment shall be removed and the trap restored to its original dimensions when the sediment has accumulated to one half the design depth of the trap. Removed sediment shall be deposited in a suitable area so that it will not erode.

3. Structures shall be removed and the area stabilized when the remaining drainage area has been properly stabilized.
EXCAVATED DROP INLET SEDIMENT TRAP NOTES:

A) GENERAL NOTES:

1. The excavated trap shall be sized to provide a minimum storage capacity calculated at the rate of 134 cubic yards per acre of drainage area. A trap shall be no less than 1 foot nor more than 2 feet deep measured from the top of the inlet structure. Side slopes shall not be steeper than 2H:1V.

2. The slope of the basin may vary to fit the drainage area and terrain. Check trap efficiency and make modifications as necessary to ensure satisfactory trapping of sediment. Where an inlet is located so as to receive concentrated flows, such as in a highway median, it is recommended that the basin have a rectangular shape in a 2:1 length-width ratio, with the length oriented in the direction of the flow.

B) INSPECTION AND MAINTENANCE:

1. The structure shall be inspected after each rain event of 1/2-inch or greater and repairs made as needed.

2. Sediment shall be removed and the trap restored to its original dimensions when the sediment has accumulated to one half the design depth of the trap. Removed sediment shall be deposited in a suitable area so that it will not erode.

3. Structures shall be removed and the area stabilized when the remaining drainage area has been properly stabilized.
SOD DROP INLET SEDIMENT TRAP
NOT TO SCALE

SOD DROP INLET SEDIMENT TRAP NOTES:

A) GENERAL NOTES:
1. SOIL SHALL BE PREPARED AND SOD INSTALLED ACCORDING TO THE SPECIFICATIONS IN ESC-03.
2. SOD SHALL BE PLACED TO FORM A TURF MAT COVERING THE SOIL FOR A DISTANCE TO THE INLET STRUCTURE.

B) INSPECTION AND MAINTENANCE:
1. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN EVENT 1/2-INCH OR GREATER AND REPAIRS MADE AS NEEDED.

CROSS SECTION

FOUR 1-FOOT WIDE STRIPS OF SOD ON EACH SIDE OF THE DROP INLET

RUNOFF WATER WITH SEDIMENT

TREATED WATER

AMERICAN PUBLIC WORKS ASSOCIATION
KANSAS CITY METROPOLITAN CHAPTER
**GRavel Curb Inlet Sediment Trap Notes:**

**A) General Notes:**

1. Wire mesh with 1/2-inch openings shall be placed over the curb inlet opening so that at least 12 inches of wire extends across the inlet cover and at least 12 inches of wire extends across the concrete gutter from the inlet opening.

2. Stone shall be piled against the wire so as to anchor it against the gutter and inlet cover and to cover the inlet opening completely.

3. If the stone becomes clogged with sediment so that it no longer adequately performs its function, the stone must be pulled away from the block and cleaned or replaced.

**B) Inspection and Maintenance:**

1. The structure shall be inspected after each rain event of 1/2-inch or greater and repairs made as needed.

2. Sediment shall be removed and the trap restored to its original dimensions when the sediment has accumulated to one half the design depth of the trap. Removed sediment shall be deposited in a suitable area so that it will not erode.

3. Structures shall be removed and the area stabilized when the remaining drainage area has been properly stabilized.

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**Note:**

"Use clean gravel 1/2" to 1" in diameter."
WOODEN WEIR CURB INLET PROTECTION

WOODEN WEIR CURB INLET PROTECTION NOTES:

A) GENERAL NOTES:

1. ATTACH A CONTINUOUS PIECE OF WIRE MESH THAT IS 30-INCH MINIMUM WIDTH X INLET THROAT LENGTH PLUS 4 FEET TO A 2 X 4 WOODEN WEIR WITH LENGTH EQUAL TO THROAT LENGTH PLUS 2 FEET. WOOD SHOULD BE CONSTRUCTION GRADE LUMBER.

2. PLACE A PIECE OF APPROVED EXTRA-STRENGTH GEOTEXTILE OF THE SAME DIMENSIONS AS THE WIRE MESH OVER THE WIRE MESH AND SECURELY ATTACH IT TO THE 2 X 4 WOODEN WEIR.

3. SECURELY NAIL THE 2 X 4 WEIR TO THE 9-INCH LONG VERTICAL SPACERS WHICH ARE TO BE LOCATED BETWEEN THE WEIR AND INLET FACE AT A MAXIMUM 8-FOOT SPACING.

4. PLACE THE ASSEMBLY AGAINST THE INLET THROAT AND NAIL A MINIMUM OF 2-FOOT LENGTHS OF 2 X 4 BOARD TO THE TOP OF THE WEIR AT SPACER LOCATIONS. THESE 2 X 4 ANCHORS SHALL EXTEND ACROSS THE INLET TOPS AND BE HELD IN PLACE BY SANDBAGS OR ALTERNATE WEIGHT.

5. THE ASSEMBLY SHALL BE PLACED SO THAT THE END SPACERS ARE A MINIMUM OF 1 FOOT BEYOND BOTH ENDS OF THE THROAT OPENING.

6. FORM THE WIRE MESH AND GEOTEXTILE TO THE CONCRETE CURB AND AGAINST THE FACE OF CURB ON BOTH SIDES OF THE INLET. PLACE COARSE AGGREGATE OVER THE WIRE MESH AND GEOTEXTILE TO PREVENT WATER FROM ENTERING THE INLET UNDER OR AROUND THE GEOTEXTILE.

7. THIS TYPE OF PROTECTION MUST BE INSPECTED FREQUENTLY AND THE GEOTEXTILE AND STONE REPLACED WHEN CLOGGED WITH SEDIMENT.

8. ASSURE THAT STORM FLOW DOES NOT BYPASS INLET BY INSTALLING TEMPORARY EARTH OR ASPHALT SIDES DIRECTING FLOW INTO INLET.

B) INSPECTION AND MAINTENANCE:

1. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN EVENT OF 1/2-INCH OR GREATER AND REPAIRS SHALL BE MADE AS NEEDED.

2. SEDIMENT SHALL BE REMOVED AND THE TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO ONE HALF THE DESIGN DEPTH OF THE TRAP. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA SO THAT IT WILL NOT ENOE)

3. STRUCTURES SHALL BE REMOVED AND THE AREA STABILIZED WHEN THE REMAINING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.

NOTE:
"GRAVEL SHALL BE COARSE AGGREGATE FROM 1/2" TO 1" IN DIAMETER."
**BLOCK AND GRAVEL CURB INLET PROTECTION**

**CURB INLET**

**CONCRETE BLOCK**

"GRAVEL SHALL BE COARSE AGGREGATE FROM 1/2" TO 1" IN DIAMETER"

**WIRE SCREEN**

**GRAVEL**

**RUNOFF WATER WITH SEDIMENT**

**OVERFLOW**

**TREATED WATER**

**SEDIMENT**

**WIRE SCREEN**

**CROSS SECTION NOT TO SCALE**

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**BLOCK AND GRAVEL CURB INLET PROTECTION NOTES:**

**A) GENERAL NOTES:**

1. TWO CONCRETE BLOCKS SHALL BE PLACED ON THEIR SIDES ABUTTING THE CURB AT EITHER SIDE OF THE INLET OPENING.

2. A 2 X 4 STUD SHALL BE CUT AND PLACED THROUGH THE OUTER HOLES OF EACH SPACER BLOCK TO HELP KEEP THE FRONT BLOCKS IN PLACE.

3. CONCRETE BLOCKS SHALL BE PLACED ON THEIR SIDES ACROSS THE FRONT OF THE INLET AND ABUTTING THE SPACER BLOCKS.

4. WIRE MESH WIRING SHALL BE PLACED OVER THE OUTSIDE VERTICAL FACE OF THE CONCRETE BLOCKS TO PREVENT STONE FROM BEING WASHED THROUGH THE HOLES IN THE BLOCKS. WIRE MESH WITH 1/2-INCH OPENINGS SHALL BE USED.

5. COARSE AGGREGATE SHALL BE PILED AGAINST THE WIRE TO THE TOP OF THE BARRIER.

6. IF THE STONE BECOMES CLOGGED WITH SEDIMENT SO THAT IT NO LONGER ADEQUATELY PERFORMS ITS FUNCTION, THE STONE MUST BE PULLED AWAY FROM THE BLOCKS AND CLEANED OR REPLACED.

**B) INSPECTION AND MAINTENANCE:**

1. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN EVENT OF 1/2-INCH OR GREATER, AND REPAIRS SHALL BE MADE AS NEEDED.

2. SEDIMENT SHALL BE REMOVED AND THE TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO ONE HALF THE DESIGN DEPTH OF THE TRAP. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA SO THAT IT WILL NOT ERODE.

3. STRUCTURES SHALL BE REMOVED AND THE AREA STABILIZED WHEN THE REMAINING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.
CULVERT INLET SEDIMENT TRAP

CULVERT INLET SEDIMENT TRAP NOTES:

A) CONSTRUCTION SPECIFICATIONS:

1. Geometric of the design will be a horseshoe shape around the culvert inlet.
2. The toe of riprap shall be no closer than 24" from the culvert opening to provide an acceptable emergency outlet for flows from larger storm events.
3. All construction specifications found within temporary sediment trap specifications apply to this practice.
4. The proper installation of the culvert inlet sediment trap is a viable substitute for the installation of the temporary sediment trap.

B) INSPECTION AND MAINTENANCE:

1. The structure shall be inspected after each rain event of 0.25" or greater, and repairs shall be made as needed.
2. Aggregate shall be replaced or cleaned when inspection reveals that clogged voids are causing ponding problems which interfere with on-site construction.
3. Sediment shall be removed and the riprap restored to its original dimensions when sediment has accumulated to one half the design depth. Removed sediment shall be deposited in a suitable area so that it will not erode and cause sedimentation problems.
4. Temporary structures shall be removed when they have served their useful purpose but not before the upslope area has been permanently stabilized.

C) GENERAL GUIDELINES:

1. The inlet protection device shall be constructed in a manner that will facilitate clean-out and disposal of trapped sediment and minimize interference with construction activities.
2. The inlet protection devices shall be constructed in such a manner that any resultant ponding stormwater will not cause excessive inconvenience or damage to adjacent areas or structures.

SOURCE: MODIFIED FROM VA. DOT, 1992

AMERICAN PUBLIC WORKS ASSOCIATION
KANSAS CITY METROPOLITAN CHAPTER
STANARD DESIGN CR-271, 1995
SEDIMENT FENCE CULVERT INLET PROTECTION NOTES:

A) GENERAL NOTES:
1. THE INLET PROTECTION DEVICE SHALL BE CONSTRUCTED IN A MANNER THAT WILL FACILITATE CLEAN-OUT AND DISPOSAL OF TRAPPED SEDIMENT AND MINIMIZE INTERFERENCE WITH CONSTRUCTION ACTIVITIES.
2. THE INLET PROTECTION DEVICES SHALL BE CONSTRUCTED IN SUCH A MANNER THAT ANY RESULTANT PONDING STORMWATER WILL NOT CAUSE EXCESSIVE INCONVENIENCE OR DAMAGE TO ADJACENT AREAS OR STRUCTURES.
3. DESIGN CRITERIA MORE SPECIFIC TO EACH PARTICULAR INLET PROTECTION DEVICE ARE FOUND IN SECTION 5103.B.

B) SUPER SEDIMENT FENCE INSTALLATION NOTES:
1. THE HEIGHT OF A SEDIMENT FENCE SHALL BE A MINIMUM OF 18 INCHES ABOVE THE ORIGINAL GROUND SURFACE AND SHALL NOT EXCEED 34 INCHES ABOVE GROUND SURFACE.
2. THE GEOTEXTILE SHALL BE PURCHASED IN A CONTINUOUS ROLL OUT TO THE LENGTH OF THE BARRIER TO AVOID THE USE OF JOINTS. WHEN JOINTS ARE UNAVOIDABLE, GEOTEXTILE SHALL BE SPLICED TOGETHER AT A SUPPORT POST, WITH A MINIMUM 6-INCH OVERLAP, AND SECURELY SEALED.
3. DIG A TRENCH AT LEAST 6 INCHES DEEP AND 4 INCHES WIDE ALONG THE FENCE ALIGNMENT.
4. DRIVE POSTS AT LEAST 24 INCHES INTO THE GROUND ON THE DOWNSLOPE SIDE OF THE TRENCH. SPACE POSTS A MAXIMUM OF 6 FEET APART.
5. EXTRA-STRENGTH SEDIMENT FENCE FABRIC SHALL BE USED. POSTS FOR THIS TYPE OF FABRIC SHALL BE PLACED A MAXIMUM OF 6 FEET APART. THE SEDIMENT FABRIC SHALL BE FASTENED SECURELY TO THE UPSLOPE SIDE OF THE POSTS USING MINIMUM ONE-INCH LONG HEAVY-DUTY WIRE STAPLES OR THE WIRES, AND EIGHT INCHES OF THE FABRIC SHALL BE EXTENDED INTO THE TRENCH. THE FABRIC SHALL NOT BE STAPLED TO EXISTING TREES.
6. PLACE THE BOTTOM 1 FOOT OF FABRIC IN THE 6-INCH DEEP TRENCH, LAPPING TOWARD THE UPSLOPE SIDE, BACKFILL WITH COMPACTED EARTH OR GRAVEL.
7. IF A SEDIMENT FENCE IS TO BE CONSTRUCTED ACROSS A DITCH LIKE OR SWALE, IT MUST BE OF SUFFICIENT LENGTH TO ELIMINATE EROSION, AND THE PLAN CONFIGURATION SHALL RESEMBLE AN ARC OR HORSESHOE WITH THE ENDS ORIENTED UPSLOPE. EXTRA-STRENGTH SEDIMENT FABRIC SHALL BE USED FOR THIS APPLICATION WITH A MAXIMUM 3-FOOT SPACING OF POSTS. ALL OTHER INSTALLATION REQUIREMENTS NOTED IN J5 APPLY.
8. TO REDUCE MAINTENANCE, EXCAVATE A SHALLOW SEDIMENT STORAGE AREA ON THE UPSLOPE SIDE OF THE FENCE. PROVIDE GOOD ACCESS IN AREAS OF HEAVY SEDIMENTATION FOR CLEAN OUT AND MAINTENANCE.
9. SEDIMENT FENCES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE BUT NOT BEFORE THE UPSLOPE AREA HAS BEEN PERMANENTLY STABILIZED.

AMERICAN PUBLIC WORKS ASSOCIATION
KANSAS CITY METROPOLITAN CHAPTER
SEDIMENT FENCE CULVERT INLET PROTECTION

SOURCE: MODIFIED FROM WA, DEC. 1992

NOT TO SCALE

"d90 2" COARSE AGGREGATE TO REPLACE SEDIMENT FENCE IN HORSESHOE WHEN HIGH VELOCITY OF FLOW IS EXPECTED

RIPRAP WITH 10" d90
DIVERSIONS

TEMPORARY DIVERSION DIKE

TEMPORARY RIGHT-OF-WAY DIVERSIONS

TEMPORARY FILL DIVERSION NOTES:
1. The diversion shall be constructed at the top of the fill at the end of each work day as needed.
2. The diversion shall be located at least 2 feet inside the top edge of the fill.
3. The supporting ridge shall be constructed with a uniform height along its entire length. Without uniform height, the fill diversion may be susceptible to breaching.

RIGHT-OF-WAY DIVERSION DETAIL NOTES:
1. The diversion shall be installed as soon as the right-of-way has been cleared and/or graded.
2. All earthen diversions shall be machine- or hand-compacted in 8-inch lifts.
3. The outlet of the diversion shall be located in an undisturbed and stabilized area where all possible. The field location should be adjusted as needed to utilize a stabilized outlet.
4. Earthen diversions which will not be subject to construction traffic should be stabilized in accordance with temporary seeding.

DISSERTATION NOTES:
1. All trees, brush, stumps, obstructions, and other objectionable material shall be removed and disposed of so as not to interfere with the proper functioning of the diversion.
2. The diversion shall be excavated or shaped to line, grade, and cross-section as required to meet the criteria specified herein, free of irregularities which will impede flow.
3. Fills shall be compacted as needed to prevent unequal settlement that would cause damage in the completed diversion. Fill shall be composed of soil which is free from excessive organic debris, rocks, or other objectionable materials.
4. All earth removed and not needed in construction shall be spread or disposed of so that it will not interfere with the functioning of the diversion.
5. Permanent stabilization of disturbed areas shall be done in accordance with section 2151.

SOURCE: MODIFIED FROM WA, OBO, 1922

AMERICAN PUBLIC WORKS ASSOCIATION

KANSAS CITY METROPOLITAN CHAPTER

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DIVERSIONS
TRAPEZOIDAL GRASS-LINED CHANNEL

A) CONSTRUCTION SPECIFICATIONS:
1. REMOVE ALL TREES, BRUSH, STUMPS, AND OTHER OBJECTIONABLE MATERIAL FROM THE FOUNDATION AREA.
2. EXCAVATE THE CHANNEL AND SHAPE IT TO MEET LINES AND DIMENSIONS ON THE PLANS PLUS A 0.2-FEET OVERCUT AROUND THE CHANNEL PERIMETER TO ALLOW FOR BULKING DURING SEEDED PREPARATIONS AND SCC BUILDUP.
3. REMOVE AND PROPERLY DISPOSE OF ALL EXCESS SOIL, SO THAT SURFACE WATER MAY ENTER THE CHANNEL FREELY.
4. THE PROCEDURE USED TO ESTABLISH GRASS IN THE CHANNEL WILL DEPEND UPON THE SEVERITY OF THE CONDITIONS AND SELECTION OF SPECIES. PROTECT THE CHANNEL WITH MULCH OR A ROLLED EROSION CONTROL PRODUCT SUFFICIENT TO WITHSTAND ANTICIPATED VELOCITY AND SHEAR STRESS DURING THE ESTABLISHMENT PERIOD.

B) INSPECTION AND MAINTENANCE:
1. CHECK THE DEVICE AFTER EVERY 1/2-INCH OR GREATER RAINFALL EVENT. IMMEDIATELY MAKE REPAIRS. CHECK THE CHANNEL OUTLET AND ALL ROAD CROSSINGS FOR BANK STABILITY AND EVIDENCE OF PIPING OR SCOUR HOLES. REMOVE ALL SIGNIFICANT SEDIMENT ACCUMULATIONS TO MAINTAIN THE DESIGN CARRYING CAPACITY. KEEP THE GRASS IN A HEALTHY, VIGOROUS CONDITION AT ALL TIMES SINCE IT IS THE PRIMARY EROSION PROTECTION FOR THE CHANNEL.

NOTES:
1. SIDE SLOPES SHOULD BE 3:1 OR FLATTER.
2. USE MULCH, EROSION CONTROL BLANKETS, TURF REINFORCEMENT MAT, OR OTHER APPROPRIATE PRACTICES AS SPECIFIED IN THE DESIGN PLAN.
3. CHANNELS SHOULD EMPTY INTO SEDIMENT TRAPS, DETENTION/RETENTION BASINS, OR STABLE OUTLETS.
4. USE A SUBSURFACE DRAIN IN AREAS WITH SEASONALLY HIGH WATER TABLES OR SEEPAGE PROBLEMS.
**INfiltration Trench**

![Diagram of infiltration trench]

**Infiltration Trench Notes:**

**A. Site Preparation:**
1. Follow erosion control plans to ensure that sediment and runoff are kept from the trench area during construction. All development should be complete before the trench is excavated.
2. Locate all utilities at the site.
3. Clear, grub, and strip the dam foundation removing all woody vegetation, rocks, and other objectionable material.
4. Dispose of trees, limbs, logs, and other debris in designated disposal areas.

**B. Swale Trench:**
1. Excavate the trench to dimensions specified in the design plan with a backhoe or trencher equipped with tracks to avoid compacting the trench area. The bottom of the trench should be level.
2. Slope trench sides or provide shoring according to safety regulations.
3. Line the bottom and sides of the trench with geotextile fabric. The fabric should be permeable enough to allow the trench to drain within 72 hours.
4. Backfill the trench with uniformly graded sand or gravel. Do not use crushed limestone, shale, or any crushed rock that will become clogged over time.
5. The installation of a perforated pipe to collect and transport excess runoff is optional. The trench should be designed so that all runoff infiltrates within 72 hours.
6. A perforated pipe may be placed in the upper part of the trench to quickly drain the top of the trench after each runoff event. However, this may allow pollutants to be transported off site with the surface runoff.
7. Place at least one observation well in each infiltration trench to monitor the performance of the trench. Perforated polyvinyl chloride (PVC) pipe or high-density polyethylene (HDPE) pipe is recommended. The bottom of the pipe should extend to within 1 inch of the geotextile in the bottom of the trench.
8. Overlap the geotextile fabric on the top of the gravel approximately 6 inches below the top of the trench. Follow manufacturer’s recommendations regarding the amount of overlap. In no case shall the overlap be less than 12 inches. Backfill the top of the trench with gravel.

**C. Underground Trench:**
1. UNDERGROUND TRENCHES CAN BE APPLIED TO A VARIETY OF SITUATIONS AND ARE AESTHETICALLY PLEASEING BUT MORE DIFFICULT TO MAINTAIN.
3. CONNECT THE PERFORATED PIPE TO THE COLLECTION PIPE. THE COLLECTION PIPE MAY BE CONNECTED TO AN INLET STRUCTURE USED TO TRAP SEDIMENT.
4. BACKFILL CLEAN GRAVEL OVER THE PIPE TO WITHIN 12 INCHES OF THE TOP OF THE TRENCH.
5. THE INSTALLATION OF A PERFORATED PIPE TO COLLECT AND TRANSPORT EXCESS RUNOFF IS OPTIONAL. THE TRENCH SHOULD BE DESIGNED TO DRAIN ALL RUNOFF WITHIN 72 HOURS. A PERFORATED PIPE MAY BE PLACED IN THE UPPER PORTION OF THE TRENCH TO QUICKLY DRAIN THE TOP OF THE TRENCH AFTER EACH RUNOFF EVENT.
6. OVERLAP THE GEOTEXTILE ACCORDING TO MANUFACTURER’S RECOMMENDATIONS, BUT IN NO CASE SHOULD THE AMOUNT OF OVERLAP BE LESS THAN 12 INCHES.
7. BACKFILL OVER THE GEOTEXTILE WITH AT LEAST 12 INCHES OF CLEAN, COMPACTED SOIL.

**D. Erosion Control:**
1. During development, use temporary diversions to prevent surface water from running onto disturbed areas.
2. Minimize the size of disturbed areas and vegetate all buffer strips as soon as the trench is constructed.
3. Divert sediment-laden water to shallow vegetated basins or a sediment collection system capable of removing sediment to prevent the infiltration trench from becoming clogged.
4. Direct all runoff into swale trenches at low velocity. Establish the slope of the top of the swale to prevent ponding of water longer than 12 hours.

**E. Troubleshooting:**
Because swale infiltration trenches can inundate water for short periods of time, they can be hazardous:
1. Avoid steep slopes; slopes around the swale infiltration trench should be kept at 20:1 or flatter.
2. Fence area and post warning signs if trespassing is likely.
3. Drain the trench between storm events.
4. Slope sides of trench or provide shoring.
Consult with a qualified design professional if any of the following occur:
1. Variations in topography or site indicate infiltration trench will not function as intended.
2. Design specifications for fill, pipe, gravel, or geotextile cannot be met; substitutions may be required.
3. Unapproved substitutions could lead to failure.
4. For the finished grades and configuration for all earthwork, check elevations and dimensions of all pipes and structures.

**F. Inspection and Maintenance:**
1. Inspect the infiltration trench after each 1/2-inch or greater storm event. Water levels in the observation wells should be recorded several days to check trench drainage.
2. Annually inspect the condition of the grass buffer strips in swale trenches. Growth should be vigorous and dense. Bare spots, eroded areas, or burned out areas should be reseeded or resodded.
3. Mow grass filter strips at least twice a year to prevent muddy growth.
4. Sediment removal inlets should be cleaned out when sediment fills 25% of the available capacity.
5. Prune tree limbs overhanging the swale trench to prevent leaves from falling onto the trench.
TEMPORARY SLOPE DRAIN

TEMPORARY SLOPE DRAIN NOTES:

A) GENERAL NOTES:

1. PLACE ON UNDISTURBED SOIL OR WELL-COMPACTED FILL.

2. THE ENTRANCE SECTION SHALL SLOPE TOWARD THE SLOPE DRAIN AT A
   MINIMUM OF 1/2 INCH PER FOOT.

3. THE SOIL AROUND AND UNDER THE ENTRANCE SECTION SHALL BE
   HAND-TAMPED IN 6-INCH LIFTS TO THE TOP OF THE Dike TO PREVENT PIPING
   FAILURE AROUND THE INLET.

4. SEDIMENT MAY BE CONTROLLED AT THE OUTLET IF UPLAND PONDING
   WILL CREATE PROBLEMS.

B) INSPECTION AND MAINTENANCE:

1. THE SLOPE DRAIN STRUCTURE SHALL BE INSPECTED WEEKLY AND AFTER EVERY STORM EVENT OF
   1/2-INCH OR GREATER, AND REPAIRS SHALL BE MADE IF NECESSARY. THE CONTRACTOR SHALL
   AVOID THE PLACEMENT OF ANY MATERIAL ON AND PREVENT CONSTRUCTION TRAFFIC ACROSS THE
   SLOPE DRAIN.
**TEMPORARY SEDIMENT TRAP**

**A) CONSTRUCTION SPECIFICATIONS:**

1. The area under the embankment shall be cleared, grubbed, and stripped of any vegetation and root mat.
2. Fill material for the embankment shall be free of roots or other woody vegetation, organic material, large stones, and other objectionable material. The embankment shall be compacted in 6-inch layers by traversing with construction equipment.
3. The earthen embankment shall be seeded with temporary or permanent vegetation immediately after installation.
4. Construction operations shall be carried out to minimize erosion and water pollution.
5. The structure shall be removed and the area stabilized when the upslope drainage area has been stabilized.
6. All cut and fill slopes shall be 2:1:4 or flatter except for excavated, wet storage areas which may be at a maximum 1:1:4 grade.

**B) INSPECTION AND MAINTENANCE:**

1. Inspect the temporary sediment trap after each storm event of 0.25-inch or greater.
2. Remove and properly dispose of sediment when it accumulates to one-half the design volume as indicated by the clean-out stake.
3. Periodically check the embankment, spillway, and outlet apron for erosion damage, settling, seepage, or slumping along the toe and repair immediately.
4. Replace the spillway gravel facing if it becomes clogged.
5. Inspect vegetation and reseed if necessary.
6. Replace any displaced riprap so that no replacement rock is above the design grade.
7. Remove the temporary sediment trap after the drainage area has been permanently stabilized, inspected, and approved. Do so by draining any water, removing the sediment to a designated disposal area, and grading the site to blend with the surrounding area; then stabilize.

**CROSS SECTION OF OUTLET**

**OUTLET (PERSPECTIVE VIEW)**

**NOTE:** See minimum top width below.

**EXCAVATED AREA**

**GEOTEXTILE**

**DRAINAGE AREA IN AC.**

**DIVERSION Dike**

**VARIABLE**

**10' RIPRAP**

**7' COARSE AGGREGATE**

**H0**

**W**

**MINIMUM TOP ELEV.**

**NOT TO SCALE**

**EXCAVATED AREA**

**MAX. DEPTH = 4'**

**SOURCE:** Modified from WA, Dec. 1992

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**KANSAS CITY METROPOLITAN CHAPTER**

**TEMPORARY SEDIMENT TRAP**
ANTI-SEEP COLLAR

INSTALL COLLAR WITH CORRUGATIONS VERTICAL.

COLLAR TO BE OF SAME SZE AS THE PIPE WITH WHICH IT IS USED.

1/2" X 2" SLOTTED HOLES FOR 3/8" DIAMETER BOLTS.

CONTINUOUS HOLE.

CONTINUOUS HOLE AT 8" C.C.

DETAILS OF CORRUGATED METAL ANTI-SEEP COLLAR

NOT TO SCALE

NOTES FOR COLLARS:

1. ALL MATERIALS TO BE IN ACCORDANCE WITH CONSTRUCTION MATERIAL SPECIFICATIONS.
2. WHEN SPECIFIED ON THE PLANS, COATING OF COLLARS SHALL BE IN ACCORDANCE WITH CONSTRUCTION AND CONSTRUCTION MATERIAL SPECIFICATIONS.
3. UNASSEMBLED COLLARS SHALL BE MARKED BY PAINTING OR TAGGING TO IDENTIFY MATCHING PAIRS.
4. THE LAP BETWEEN THE TWO HALF SECTIONS AND BETWEEN THE PIPE AND CONNECTING BAND SHALL BE CAUSED WITH ASPHALT MASTIC AT TIME OF INSTALLATION.
5. EACH COLLAR SHALL BE FURNISHED WITH TWO 1/2" DIAMETER RODS WITH STANDARD TANK LUGS FOR CONNECTING COLLARS TO PIPE.

SECTION B-B

NOT TO SCALE

DETAILS OF HELICAL PIPE ANTI-SEEP COLLAR

WELD 1 1/8" X 1 1/8" X 1 1/8" ANGLES TO COLLAR OR BEND A 90° ANGLE 1 1/8" WIDE AS SHOWN IN DRAWING.

NOTE:

FOR BANDS AND COLLARS MODIFICATIONS OF THE DETAILS SHOWN MAY BE USED PROVIDING EQUAL WATER TIGHTNESS IS MAINTAINED AND DETAILS DRAWINGS ARE SUBMITTED AND APPROVED BY THE ENGINEER PRIOR TO DELIVERY.

ISOMETRIC VIEW

NOT TO SCALE

SHEET METAL COLLAR SHALL BE CUT TO FIT CORRUGATIONS OF HELICAL BAND AND WELDED WITH A CONTINUOUS WELD.

DETAILS OF WELDED CONNECTIONS BETWEEN THE ANTI-SEEP AND THE BARREL.

AT NEEDS MUST BE WATER TIGHT.

AMERICAN PUBLIC WORKS ASSOCIATION

KANSAS CITY METROPOLITAN CHAPTER

ANTI-SEEP COLLAR

SOURCE: MODIFIED FROM VA. DEP. 1992
CONSTRUCTION SPECIFICATIONS:

A) SITE PREPARATION:
1. LOCATE ALL UNDERGROUND UTILITIES.
2. FOLLOW ALL FEDERAL, STATE, AND LOCAL REQUIREMENTS.
3. CLEAR, DRAIN, AND STRIP THE DAM FOUNDATION REMOVING ALL VEGETATIONAL ROCKS AND OTHER NONDEBRIS MATERIAL.
4. DISPOSE OF TREES, LINNS, LOGS, AND OTHER DEBRIS IN DESIGNATED MURDER AREAS.
5. EXCAVATE THE PRINCIPAL SPIFFWAY AREA, OUTLET APRON FIRST, THEN PROVIDE ANY SURFACE SOIL HAVING HIGH AMOUNTS OF ORGANIC MATTER FOR LATER USE.
6. CLEAR THE BASE AND GRADE TO ALLOW SURFACE DRAINAGE AND TO ENCOURAGE ESTABLISHMENT OF A GOOD COVER OF VEGETATION.
USE TRACKED EQUIPMENT TO AVOID COMPACTION.

B) PRINCIPAL SPIFFWAY:
1. SITE THE SPIFFWAY PIPE AND RISER ON A FIRM, EVEN FOUNDATION. PREPARE THE BEDDING FOR THE PIPE.
2. PLACE AROUND THE BARREL A 4-INCH LAYER OF MOIST, CLAYY, WORKABLE SOIL, NOT POROUS MATERIAL SUCH AS SAND, GRAVEL, OR SILT; COMPACT WITH HAND TAMPER OR TO AT LEAST THE DENSITY OF THE FOUNDATION SOIL. DO NOT RAISE THE PIPE FROM THE FOUNDATION WHEN COMPACTING UNDER THE PIPE HANGERS.
3. EMBRACE THE RISER AT 1 INCH CONCRETE TO PROVIDE AN ANTI-SUBLIMATION BLOCK. THE WEIGHT OF THE CONCRETE SHOULD BALANCE THE BUOYANT FORCE ACTING ON THE RISER.
4. PLACE A RISER RACK AROUND THE RISER INLET. TRASH RACKS CAN BE CONSTRUCTED BY WELDING A RIBBON IN A GRID WITH 4 TO 6-INCH SPACINGS.
5. INSTALL AN ANTI-SEEP DEVICES.
6. AT THE PIPE OUTLET, INSTALL A RIPRIP OR CONCRETE APRON AT LEAST 5 FEET WIDE AND 10 FEET LONG TO A STABLE GRADE.

C) EMBANKMENT:
1. SCARP THE EMBANKMENT FOUNDATION BEFORE PLACING FILL.
2. USE BULK FILL FROM PREDETERMINED BORROW AREAS. IT SHOULD BE CLEAN, STABILE, SOIL FREE OF ORGANIC MATERIAL, ROCKS, OR SALT. IT MUST BE WET ENOUGH TO AVOID CRACKING BUT NOT SO WET THAT WATER CAN BE SQUEEZED OUT.
3. PLACE THE MOST PERMISSIBLE SOIL IN THE DOWNSTREAM TOE AND THE LEAST PERMISSIBLE IN THE CENTER PORTION OF THE DAM.
4. COMPACT THE FILL MATERIAL IN 6 TO 8-INCH CONTINUOUS LAYERS OVER THE LENGTH OF THE DAM. CONSTRUCTION EQUIPMENT MAY BE BOUND OVER THE DAM SO THAT EACH LAYER IS TRAVELLED BY AT LEAST ONE WHEEL OF THE MACHINE. TRENCHED CONSTRUCTION EQUIPMENT DOES NOT PROVIDE ADEQUATE COMPACTION.
5. PROJECT THE SPIFFWAY BARREL WITH 2 FEET OF COMPACTION, HAND-TAMPED FILL, THEN TRAVELLING OVER THE PIPE WITH A TRUCK. COMPACT THE DAM TO IT ABOVE THE DESIGN HEIGHT TO ALLOW FOR SETTLING.

D) EMERGENCY SPIFFWAY:
1. CONSTRUCT THE SPIFFWAY IN UNDISTURBED SOIL AROUND THE END OF THE EMBANKMENT AND LOCATE IT SO THAT THE EXCESS FLOW WILL RETURN TO THE RECEIVING CHANNEL WITHOUT DAMAGING THE EMBANKMENT.
2. STABILIZE THE SPIFFWAY WITH VEGETATION AS SOON AS GRADING IS COMPLETED, OR INSTALL PAVING MATERIAL TO FINISHED GRADE IF THE SPIFFWAY IS NOT TO BE VEGETATED.

E) EROSION CONTROL:
1. MINIMIZE THE SIZE OF DISTURBED AREAS. AT THE COMPLETION OF EACH PHASE OF CONSTRUCTION, VEGETATE THE DISTURBED AREAS TO MINIMIZE EROSION.
2. USE TEMPORARY DIVERSIONS TO PREVENT SURFACE WATER FROM RUNNING INTO DISTURBED AREAS.
3. DIRECT ALL RUNOFF INTO THE BASIN AT LOW VELOCITY. EMBANKMENT THE PRINCIPAL SPIFFWAY OUTLET ELEVATION TO PREVENT PONDING OF WATER LONGER THAN 72 HOURS.
4. STABILIZE ALL DISTURBED AREAS EXCEPT THE LOWER HALF OF THE EMBANKMENT IMMEDIATELY AFTER CONSTRUCTION.

F) SAFETY:
BECAUSE DETENTION PONDS THAT IMPACT WATER ARE HAZARDOUS, THE FOLLOWING PRECAUTIONS SHOULD BE TAKEN:
1. AVOID STEEP SLOPES; SLOPES SHOULD BE EMBANKMENT.
2. AVOID SLOPES OF 3:1 OR FLATTER; 3:1 IS REQUIRED MAINTAINED BY TRUCK OR OTHER EQUIPMENT.
3. FENCE AREA AND POST WARNING SIGNS IF TRESPASSING IS LIKELY.
4. DENY THE BASIN BETWEEN STORM EVENTS.

C) INSPECTION AND MAINTENANCE:
1. INSPECT THE BASIN AFTER EACH STORM EVENT OF 1/2 INCH OR GREATER. IF THE BASIN STARTS TO POND WATER FOR EXTENDED PERIODS OF TIME, IT MAY BE CLOSED AND NEED TO BE CLEARED OUT.
2. REMOVE PROPERLY ANY DEBRIS THAT HAS BEEN COLLECTED AT THE UPHILL END OF THE BASIN.
3. PERIODICALLY CHECK THE EMBANKMENT, EMERGENCY SPIFFWAY, AND OUTLET FOR EROSION DAMAGE, PIPING, SETTLING, SEEPAGE, OR SLIDING ALONG THE TOE OR AROUND THE RAILER REPAIR IMMEDIATELY.
4. REMOVE TRASH AND OTHER DEBRIS FROM THE RISER, EMERGENCY SPIFFWAY, AND POOL AREA.
5. CLEAN OR REPLACE THE GRANDE RINING THE RISER IF THE POND POOL DOES NOT DRAIN PROPERLY.

SOURCE: MODIFIED FROM WRC, 1995

AMERICAN PUBLIC WORKS ASSOCIATION
KANSAS CITY METROPOLITAN CHAPTER
DETENTION/INFILTRATION BASIS
DIVERSION CHANNEL CROSSING NOTES:

A) GENERAL NOTES:

1. The diversion channel crossing must be operational before work is done in the stream. Construction will be performed in the dry.
2. Minimum width of bottom shall be 1 foot, equal to the bottom width of existing streambeds, whichever is less.
3. Maximum steepness of side slopes shall be 0.6:1. Depth and grade may be variable, dependent on site conditions, but shall be sufficient to ensure continuous flow of water in the diversion.
4. Channel must be lined with riprap or turf reinforcement mat depending on the expected velocity and shear stress in the channel.
5. Stream diversions may be seeded with a standard seed mix for the types of soil encountered and the time of year. Seed is sown. An average growth of two inches in height shall be achieved throughout the diversion with an 85% cover before water is allowed through it.
6. Stream diversion liners shall be secured at the upstream and downstream sides with non-erodible weights such as riprap. These weights shall allow normal flow of the stream. Soil shall not be mixed with stream diversion weights.
7. Stream diversion liners should be overlapped when a single or continuous liner is not available or is impractical. Overlap should be such that continuous flow of the stream is maintained. An upstream section should overlap a downstream section by a minimum of 15 inches. Overlaps along the cross-section should be made so that a liner is placed in the diversion bottom first and additional pieces of liner on the slopes overlap the bottom piece by a minimum of 18 inches. See detail for trimming installation.
8. Stream diversion liners shall be entrenched at the top of the slopes along with a line of sediment fence. Sediment fence may be excluded if the diversion liner is extended to such a point that sedimentation of the stream will not occur. If sediment fence is excluded, the diversion liner must be secured. Liners shall extend from slope break to slope break.
9. Staples used in securing soil-stabilization blankets and matting or riprap shall be used as necessary to anchor stream diversion liners to the side slopes of the diversion. See detail on drawing 030 for staple patterns.
10. Non-erodible materials such as riprap, jersey barriers, sandbags, plywood, or sheet piling shall be used as flow barriers to divert the stream away from its original channel and to prevent or reduce water backup into the construction area.
11. The downstream flow barrier is to be removed prior to the upstream barrier when opening a stream diversion.
12. Streams should be rediverted upon completion of the utility crossing for which the diversion was built. Prior to rediversion, any materials used to prevent water backup into the downstream end of the original streambed shall be removed. This material should not be placed in the downstream end of the diversion until after water has been rediverted to the original waterway. The stream should then be rediverted by removing all the materials damming the upstream end of the original streambed. The diversion should be sealed off at the downstream end and then backfilled. Once started, any work to relocate the stream shall not be discontinued until it is completed.
13. Stream should be rediverted only after backfilling and restabilization of the streambed and banks is completed. Restabilization shall consist of the installation of ungrouted riprap on all disturbed streambed areas or on the area 6 feet to either side of the centerline of its utility trench, whichever is greater. Slopes shall be of 3:1:1 or steeper. Refer to section 2605, Riprap for Installation Requirements. For slopes of 3:1:1 or flatter, vegetative stabilization may be used, pending approval by the plan-approving authority or inspection authority. Stabilization of streambeds and banks and the approach areas should occur immediately following the attainment of final grade.

B) INSPECTION AND MAINTENANCE:

Care must be taken to inspect any stream crossing area at the end of each day to ensure the construction materials are positioned securely. This will ensure that the work area stays dry and that no construction materials float downstream.
FLUME PIPE CROSSING

A) GENERAL NOTES:

1. THE FLUME PIPE CROSSING MUST BE MADE OPERATIONAL PRIOR TO THE START OF CONSTRUCTION IN THE STREAM.

2. CULVERTS, STONE, AND GEOTEXTILE MUST MEET THE PHYSICAL CONSTRAINTS FOR VEHICULAR TRAFFIC.

3. A LARGE FLUME PIPE OF AN ADEQUATE SIZE TO SUPPORT NORMAL CHANNEL FLOW SHALL THEN BE INSTALLED IN THE STREAM BED ACROSS THE PROPOSED TRENCH CENTERLINE. COARSE AGGREGATE, MINIMUM SIZE 2", OR RIPRAP SHALL BE PLACED CLOSE TO EACH END OF THE FLUME PIPE TO FORCE THE WATER TO FLOW THROUGH THE FLUME PIPE.

4. THE WATER CAN THEN BE PUMPED FROM WITHIN THE DANKED-OFF AREA INTO AN APPROVED DEPOSITING STRUCTURE. SEE DETAILS ESC-42 THROUGH ESC-44. THE TRENCH CAN THEN BE MSG UNDER THE FLUME PIPE. THE PIPE SECTIONS WILL THEN BE INSTALLED TO THE PROPER DEPTH UNDER THE FLUME PIPE. AFTER PIPE SECTIONS ARE INSTALLED, THE DITCH WILL BE BACKFILLED AND RESTABLISHED.

5. RESTABILIZATION SHALL CONSIST OF THE INSTALLATION OF UNROUTED RIPRAP ON ALL DISTURBED STREAMBANK AREAS, OR ON THE AREA 6 FEET EITHER SIDE OF THE CENTERLINE OF THE UTILITY TRENCH, WHICHEVER IS GREATER. SLOPES SHALL BE 3H:1V OR STEEPER. REFER TO SECTION 2501, RIPRAP FOR INSTALLATION REQUIREMENTS. FOR SLOPES OF 3H:1V OR FLATTER, VEGETATIVE STABILIZATION MAY BE USED. PENDING APPROVAL BY THE PLAN-APPROVING AUTHORITY OR INSPECTION AUTHORITY, STABILIZATION OF THE STREAMBED AND BANKS AND THE APPROACH AREAS SHOULD OCCUR IMMEDIATELY FOLLOWING THE ACHIEVEMENT OF FINAL GRADE.

6. AFTER COMPLETION OF BACKFILLING, RESTORATION OF THE BANKS, AND LEVELING OF STREAM BED, THE FLUME PIPE CAN BE REMOVED. THE GRAVEL CAN BE REMOVED OR SPREAD IN THE STREAM BED DEPENDING ON PERMIT REQUIREMENTS. SEDIMENT CONTROL IN APPROACH AREAS SHALL NOT BE REMOVED UNTIL ALL CONSTRUCTION IS COMPLETED IN THE CROSSING AREA. ALL GROUND CONTOURS SHALL BE RETURNED TO THEIR ORIGINAL CONDITION.

B) INSPECTION AND MAINTENANCE:

CARE MUST BE TAKEN TO INSPECT ANY STREAM CROSSING AREA AT THE END OF EACH DAY TO ENSURE THAT CONSTRUCTION MATERIALS ARE POSITIONED SECURELY SO THAT THE WORK AREA STAYS DRY AND THAT CONSTRUCTION MATERIALS FLOAT DOWNSTREAM.

AMERICAN PUBLIC WORKS ASSOCIATION
KANSAS CITY
METROPOLITAN CHAPTER

SOURCE: MODIFIED FROM WA.BOR, 1992

SOURCE: MODIFIED FROM WA.BOR, 1992

SECTION A-A

SECTION B-B
COFFERDAM CROSSING NOTES:

A) GENERAL NOTES:

1. TO BE USED WHEN STREAM DIVERSION IS NOT PRACTICAL AND STREAM IS 10 FEET OR WIDER TO MAKE COFFERDAM INSTALLATION PRACTICAL.

2. CONSTRUCTION IS TO BE PERFORMED DURING LOW FLOW PERIODS.

3. CROSSING SHALL BE ACCOMPLISHED IN A MANNER THAT WILL NOT PROHIBIT THE FLOW OF THE STREAM.

4. AS WITH ALL UTILITY LINE CROSSINGS, APPROACH AREAS MUST BE CONTROLLED WITH PERIMETER MEASURES SUCH AS SEDIMENT FENCE.

5. REMOVE LARGE ROCKS, WOODY VEGETATION, OR OTHER MATERIAL FROM THE STREAMBED AND BANKS THAT MAY GET IN THE WAY OF PLACING THE RIPRAP, SANDBAGS, SHEET METAL, OR WOOD PLANKS OR INSTALLING THE UTILITY PIPE OR LINE.


7. INSTALL THE UTILITY PIPE OR LINE IN HALF THE STREAMBED. REMOVE THE RIPRAP OR OTHER MATERIALS AND BEGIN PLACING THEM ON THE OTHER SIDE OF THE STREAM.

8. RESTATIBILIZATION SHALL CONSIST OF THE INSTALLATION OF UNROOTED RIPRAP ON ALL DISTURBED STREAMBANK AREAS OR ON THE AREA 6 FEET TO BOTH SIDES OF THE CENTERLINE OF ITS UTILITY TRENCH. NOXIOUS PLANTS SHALL BE 3:1:1 OR STEEP. REFER TO THE RIPRAP SECTION FOR INSTALLATION REQUIREMENTS. FOR SLOPES OF 3:1:1 OR FLATTER, VEGETATIVE STABILIZATION MAY BE USED, PENDING APPROVAL BY PLAN-APPROVING AUTHORITY OR INSPECTION AUTHORITY. STABILIZATION OF STREAMBED AND BANKS AND APPROACH AREAS SHOULD OCCUR IMMEDIATELY FOLLOWING THE ATTAINMENT OF FINAL GRADE.

B) INSPECTION AND MAINTENANCE:

CARE MUST BE TAKEN TO INSPECT ANY STREAM CROSSING AREA AT THE END OF EACH DAY TO MAKE SURE THAT THE CONSTRUCTION MATERIALS ARE POSITIONED SECURELY. THIS WILL ENSURE THAT THE WORK AREA STAYS DRY AND THAT NO CONSTRUCTION MATERIALS FLOAT DOWNSTREAM.
**TEMPORARY CULVERT CROSSING**

1. **ELEVATION**
   - 2"-4" COARSE AGGREGATE
   - 6" DEEP
   - EARTH FILL
   - COVERED BY LARGE ANGULAR ROCK
   - GEOTEXTILE
   - CAPACITY OF PIPE CULVERTS TOGETHER = FLOW

2. **PLAN VIEW**
   - 2"-4" COARSE AGGREGATE
   - LARGE ANGULAR ROCK OVER EARTH FILL
   - DIVERSION OR SWALE
   - TOP OF BANK
   - 50' MINIMUM
   - DIVERSION OR SWALE
   - TOP OF BANK
   - 50' MINIMUM

**TEMPORARY CULVERT CROSSING NOTE:**

**A) GENERAL NOTES:**

1. CLEARING AND EXCAVATION OF THE STREAM BED AND BANKS SHALL BE KEPT TO A MINIMUM.

2. THE INVERT ELEVATION OF THE CULVERT SHALL BE INSTALLED ON THE NATURAL STREAMBED GRADE TO MINIMIZE INTERFERENCES WITH FISH MIGRATION.


4. THE CULVERT SHALL EXTEND A MINIMUM OF 1 FOOT BEYOND THE UPSTREAM AND DOWNSTREAM TOE OF THE AGGREGATE PLACED AROUND THE CULVERT. IN NO CASE SHALL THE CULVERT EXCEED 40 FEET IN LENGTH.

5. THE CULVERT SHALL BE COVERED WITH A MINIMUM OF 1 FOOT OF AGGREGATE. IF MULTIPLE CULVERTS ARE USED, THEY SHALL BE SEPARATED BY AT LEAST 12 INCHES OF COMPACTED AGGREGATE FILL.


7. UPON REMOVAL OF THE STRUCTURE, THE STREAM SHALL IMMEDIATELY BE SHAPED TO ITS ORIGINAL CROSS-SECTION AND PROPERLY STABILIZED.

**B) INSPECTION AND MAINTENANCE:**

CARE MUST BE TAKEN TO INSPECT ANY STREAM CROSSING AREA AT THE END OF EACH DAY TO MAKE SURE THAT THE CONSTRUCTION MATERIALS ARE POSITIONED SECURELY. THIS WILL ENSURE THAT THE WORK AREA STAYS DRY AND THAT NO CONSTRUCTION MATERIALS FLOAT DOWNSTREAM.
TEMPORARY BRIDGE CROSSING NOTES:

A) GENERAL NOTES:
1. CLEARING AND EXCAVATION OF THE STREAM BED AND BANKS SHALL BE KEPT TO A MINIMUM.
2. THE TEMPORARY BRIDGE STRUCTURE SHALL BE CONSTRUCTED AT OR ABOVE BANK ELEVATION TO PREVENT THE ENTRAPMENT OF FLOATING MATERIALS AND DEBRIS.
3. ABUTMENTS SHALL BE PLACED PARALLEL TO AND ON STABLE BANKS.
4. BRIDGES SHALL BE CONSTRUCTED TO SPAN THE ENTIRE CHANNEL. IF THE CHANNEL WIDTH EXCEEDS 8 FEET, AS MEASURED FROM TOP OF BANK, A FOOTING, PIER, OR BRIDGE SUPPORT MAY BE CONSTRUCTED WITHIN THE WATERWAY. ONE ADDITIONAL FOOTING, PIER, OR BRIDGE SUPPORT WILL BE PERMITTED FOR EACH ADDITIONAL 8-FOOT WIDTH OF THE CHANNEL. NO FOOTING, PIER, OR BRIDGE SUPPORT, HOWEVER, WILL BE PERMITTED WITHIN THE CHANNEL FOR WATERWAYS WHICH ARE LESS THAN 8 FEET WIDE.
5. STRINGERS SHALL EITHER BE LOGS, SAWN TIMBER, PRESTRESSED CONCRETE BEAMS, METAL BEAMS, OR OTHER APPROVED MATERIALS.
6. DECKING MATERIALS SHALL BE OF SUFFICIENT STRENGTH TO SUPPORT THE ANTICIPATED LOAD. ALL DECKING MEMBERS SHALL BE PLACED PERPENDICULAR TO THE STRINGERS, BUTTED TIGHTLY, AND SECURELY FASTENED TO THE STRINGERS. DECKING MATERIALS MUST BE BUTTED TIGHTLY TO PREVENT ANY SOIL MATERIAL OR DEBRIS FROM FALLING INTO THE WATERWAY BELOW.
7. RUN PLANKING SHALL BE SECURELY FASTENED TO THE LENGTH OF THE SPAN. ONE RUN PLANK SHALL BE PROVIDED FOR EACH TRACK OF THE EQUIPMENT WHEELS. ALTHOUGH RUN PLANKS ARE OPTIONAL, THEY MAY BE NECESSARY TO PROPERLY DISTRIBUTE LOADS.
8. CURBS OR FENDERS MAY BE INSTALLED ALONG THE OUTER SIDES OF THE DECK AND ARE AN OPTION WHICH WILL PROVIDE ADDITIONAL SAFETY.
9. BRIDGES SHALL BE SECURELY ANCHORED AT ONLY ONE END USING STEEL CABLE OR CHAIN. ANCHORING AT ONLY ONE END WILL PREVENT CHANNEL OBSTRUCTION IN THE EVENT THAT FLOODWATERS FLOAT THE BRIDGE. ACCEPTABLE ANCHORS ARE LARGE TREES, LARGE BOULDERS, OR DRIVEN STEEL ANCHORS. ANCHORING SHALL BE SUFFICIENT TO PREVENT THE BRIDGE FROM FLOATING DOWNSTREAM AND POSSIBLY CAUSING AN OBSTRUCTION TO THE FLOW.
10. ALL AREAS DISTURBED DURING INSTALLATION SHALL BE STABLED WITHIN 7 CALENDAR DAYS OF THAT DISTURBANCE. WHEN THE TEMPORARY BRIDGE IS NO LONGER NEEDED, ALL STRUCTURES INCLUDING ABUTMENTS AND OTHER BRIDGING MATERIALS SHOULD BE REMOVED IMMEDIATELY.

B) INSPECTION AND MAINTENANCE:
CARE MUST BE TAKEN TO INSPECT ANY STREAM CROSSING AREA AT THE END OF EACH DAY TO MAKE SURE THAT THE CONSTRUCTION MATERIALS ARE POSITIONED SECURELY. THIS WILL ENSURE THAT THE WORK AREA STAYS DRY AND THAT NO CONSTRUCTION MATERIALS FLOAT DOWNSTREAM.
STRAW BALE/SEDIMENT FENCE PIT NOTES:

A) GENERAL NOTES:

1. PIT SHALL CONSIST OF STRAW BALE, SEDIMENT FENCE, A STONE OUTLET THAT IS A COMBINATION OF RIPRAP AND AGGREGATE, AND A DRY STORAGE PIT.

2. THE STRUCTURE MUST HAVE A CAPACITY WHICH IS DICTATED BY THE FOLLOWING FORMULA:

   \[ \text{PUMP DISCHARGE (GPM)} \times 16 = \text{CUBIC FEET OF STORAGE REQUIRED} \]

3. IN CALCULATING THE CAPACITY, INCLUDE THE VOLUME AVAILABLE FROM THE FLOOR OF THE EXCAVATION TO THE CREST OF THE STONE MIR.

4. THE EXCAVATED AREA SHOULD BE A MINIMUM OF 3 FEET BELOW THE BASE OF THE STRAW BALES OR SEDIMENT FENCE.

5. THE PERIMETER MUST BE INSTALLED AS PER THE GUIDELINES FOUND IN SECTION A, STRAW BALE BARRIER AND IN SECTION A, SEDIMENT FENCE.


7. THE DRY STORAGE PIT MAY BE DEWATERED ONLY AFTER A MINIMUM OF 6 HOURS OF SEDIMENT SETTLING TIME. THIS EFFLUENT SHOULD BE PUMPED ACROSS A WELL-VEGETATED AREA OR THROUGH A SEDIMENT FENCE PRIOR TO ENTERING A WATERCOURSE.

8. ONCE THE DRY STORAGE AREA IS FILLED TO HALF OF THE EXCAVATED DEPTH, ACCUMULATED SEDIMENT SHALL BE REMOVED AND PROPERLY DISPOSED OF.

9. ONCE THE DEVICE HAS BEEN REMOVED, GROUND CONTOURS WILL BE RETURNED TO ORIGINAL CONDITION.

B) INSPECTION AND MAINTENANCE:

1. THE DEWATERING DEVICES MUST BE INSPECTED FREQUENTLY AND REPAIRED OR REPLACED. ONCE THE SEDIMENT BUILD-UP PREVENTS THE STRUCTURE FROM FUNCTIONING AS DESIGNED.

2. THE ACCUMULATED SEDIMENT WHICH IS REMOVED FROM A DEWATERING DEVICE MUST BE SPREAD ON SITE AND STABILIZED OR DISPOSED OF AT AN APPROVED DISPOSAL SITE AS PER APPROVED PLAN.
**DEWATER BOX NOTES:**

**A) GENERAL NOTES:**

1. The box selected should be made of steel, sturdy wood, or other materials suitable to handle the pressure requirements imposed by the volume of water. Fifty-five gallon drums sealed top to bottom are normally readily available and in most cases will suffice.

2. Bottom of the box shall be made porous by drilling holes.

3. Coarse aggregate shall be placed over the holes at a minimum depth of 12 inches. Metal hardware cloth may be required between the aggregate and the holes if holes are drilled larger than the majority of the stone.

4. As a result of the fast rate of flow through the aggregate, the effluent must be directed over a well-vegetated strip at least 50 feet long after leaving the base of the filter box.

5. The box shall be sized as follows:

   PUMP DISCHARGE (GPM) X 16 = CUBIC FEET OF STORAGE REQUIRED

6. Once the water level nears the top of the box, the pump must be shut off while the box drains and additional capacity is made available.

7. The box shall be designed to allow for emergency flow over the top.

   NOTE: Using a dewater box only allows for minimal settling time for sediment particles; therefore, it should only be used when site conditions restrict the use of the other methods.

**B) INSPECTION AND MAINTENANCE:**

1. The dewatering devices must be inspected frequently and repaired or replaced once the sediment build-up prevents the structure from functioning as designed.

2. Clean-out of the box is required once one-third of the original capacity is depleted due to sediment accumulation. The tank shall be clearly marked showing the clean-out point.

3. The accumulated sediment which is removed from a dewatering device must be spread on site and stabilized or disposed of at an approved disposal site as per approved plan.
**DIRT BAG® NOTES:**

**A) GENERAL NOTES:**

1. The DIRT BAG® will have an opening large enough to accommodate a 4" discharge hose with attached strap to prevent the pumped water from escaping the DIRT BAG® without being treated.

2. Install the DIRT BAG® on a slope. It should be placed so the incoming water flows through the DIRT BAG®, do not allow water to flow out of the opening without being treated through the fabric. To increase the efficiency of the filtration, the bag should be placed on an aggregate bed to allow water to flow through all surfaces of the bag.

3. Disposal may be accomplished as directed by the engineer. If the site allows, the DIRT BAG® may be cut open and seeded, removing the visible fabric. The DIRT BAG® is strong enough to be lifted if it must be hauled away.

**B) INSPECTION AND MAINTENANCE:**

The DIRT BAG® should be considered full when it is impractical for the bag to treat sediment laden runoff at a reasonable rate, and should be replaced with a new DIRT BAG®.
**TURBIDITY CURTAIN**

**TURBIDITY CURTAIN NOTES:**

**A) GENERAL NOTES:**

1. **TYPE I** is designed for use in small lakes and ponds with little or no wind current and light turbidity.

2. **TYPE II** is designed for use on rivers and streams, large open lakes, bays, and beaches with moderate currents and wind exposure.

3. **TYPE III** is similar to **TYPE II** only with additional stress plates or special fabric to help relieve stresses caused by strong currents.

**B) INSPECTION AND MAINTENANCE:**

1. The primary care the barrier requires while in use consists of keeping the anchor lines secure and properly positioned to allow the barrier to function as efficiently as possible.

2. Should repairs to the geotextile fabric become necessary, there are normally repair kits available from manufacturers; manufacturer’s instructions must be followed to ensure the adequacy of the repair.

3. When the curtain is no longer required as determined by the inspector, the curtain and related components shall be removed so as to minimize turbidity. Remaining sediment shall be sufficiently settled before removing the curtain. Sediment may be removed and the original depth or plan elevation restored. Any spoils must be taken to upland area and stabilized.

**AMERICAN PUBLIC WORKS ASSOCIATION**

**KANSAS CITY**

**METROPOLITAN CHAPTER**

**TURBIDITY CURTAIN**

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**Source:** Modified from NA OEC, 1992
TURBIDITY CURTAIN TYPICAL LAYOUTS

TURBIDITY CURTAIN INSTALLATIONS NOTES:

A) INSTALLATION IN CURRENTS:
   1. The current adds forces to the barrier which must be resisted by the load lines and anchoring system. Type II and Type III barriers are equipped with top load cables. These cables are used to transmit the loads on the barrier to the anchor points at the terminal ends and to any anchors spaced along the barrier length.
   2. Additional anchors are generally required at the joints between barrier sections and sometimes at locations along the bottom between joints. When the current is in excess of 3 feet per second, the entire installation should be designed by a qualified engineer. A plan of the barrier perimeter should be made keeping in mind the direction and velocity of the current. Loads on the barrier and the anchoring system must be determined. The anchor locations should be marked with buoys conforming to the location plan before the barrier is deployed, and the anchors, when set in place, should be tested to ensure their holding capacity is sufficient for the loads expected.

B) FLOATING BARRIERS INSTALLATION IN CALM WATERS:
   This barrier is deployed around the construction site without any special anchorage. It may be desirable to place stakes at points along the perimeter to hold the barrier in position. The ends should be anchored well up on the shore. A strong steel or wood post is generally adequate for this purpose. The lower edge of the curtain should be above the bottom at the lowest water level expected.

C) ACROSS CURRENT:
   1. If intermediate anchor points are required, they should be in place with buoys marking their location before deploying the barrier.
   2. Set the terminal end anchor points well up on shore. Tie off one end of the barrier to the upstream anchor point. Stretch the flueled barrier out along the bank if possible or along the shoreline as close to the bank as possible. With a boat take the free end of the barrier to the opposite shore and secure it. From the upstream side of the barrier use the boat to bring the barrier connection points back to the matching intermediate anchor points. After all anchor points are connected, unfurl the barrier.

D) PARALLEL TO CURRENT:
   1. If intermediate anchor points are required, they should be in place with buoys marking their location before deploying the barrier.
   2. Set the upstream and downstream anchor points. Tie off one end of the barrier to the upstream anchor point. Allow the flueled barrier to drift downstream. Connect the intermediate anchors to the matching barrier points as the curtain is deployed. Tie off the downstream end of the barrier, return to the intermediate anchor points and make any necessary adjustments in the lines. After all anchor points are connected, unfurl the barrier.

STREMS, PONDS AND LAKES (PROTECTED AND NON-TIDAL) NOT TO SCALE

TIDAL WATERS AND/OR HEAVY WIND AND WAVE ACTION NOT TO SCALE

SOURCE: MODIFIED FROM VA. DCR, 1992 AND RIVER-FLO CANVAS PRODUCTS, INC., 1995