

11 Clearwater Drive Little Rock, AR 72204 501.688.1400

Specification Details Index

7/22/2009 11:25:16 AM

Erosion Control Details (ECD)

Standard Details

LRW ECD 3.00	Rock Check Dam
LRW ECD 3.01	Woven Willow Check Dam
LRW ECD 3.02	Semi-Pervious Straw Bale Sediment Barrier
LRW ECD 3.03	Straw Bale Dike
LRW ECD 3.04	Straw Bale/Gravel Drop Inlet Sediment Barrier
LRW ECD 3.05	Straw Anchoring
LRW ECD 3.06	Surface Roughening
LRW ECD 3.07	Silt Fence
LRW ECD 3.08	Silt Fence Typical Placement – One Slope
LRW ECD 3.09	Silt Fence Typical Placement – Two Slopes
LRW ECD 3.10	Silt Fence Placement for Perimeter Control
LRW ECD 3.11	Silt Fence Installation
LRW ECD 3.12	Curb Inlet Sediment Barrier (Sandbags)
LRW ECD 3.13	Rock Deflector

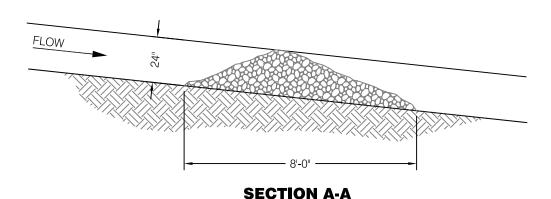
LRW ECD 3.14	Riprap Protection
LRW ECD 3.15	Rock Lined Channel
LRW ECD 3.16	In-Stream Erosion and Sediment Control Isolation Techniques
LRW ECD 3.17	In-Stream Erosion and Sediment Control Isolation Techniques
LRW ECD 3.18	In-Stream Erosion and Sediment Control Isolation Techniques
LRW ECD 3.19	Grass-Lined Channel Typical Installation
LRW ECD 3.20	Grass-Lined Channel Typical Cross Sections
LRW ECD 3.21	Temporary Gravel Construction Entrance/Exit
LRW ECD 3.22	Energy Dissipater
LRW ECD 3.23	Curb and Gutter Sediment Barrier
LRW ECD 3.24	Continuous Berm
LRW ECD 3.25	Coir Rolls / Coir Mats
LRW ECD 3.26	Erosion Blankets & Turf Reinforcement Mats Channel Installation
LRW ECD 3.27	Curb Inlet Sediment Barrier (Block & Gravel)
LRW ECD 3.28	Block and gravel Drop Inlet Sediment Barrier

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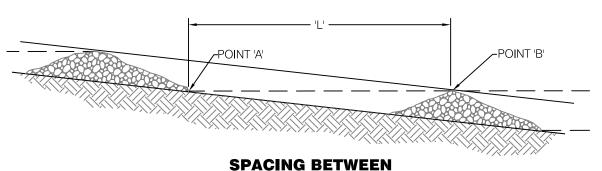
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VIEW LOOKING UP STREAM

NOTE: KEY STONE INTO THE DITCH BANKS AND EXTEND IT BEYOND THE ABUTMENTS A MINIMUM OF 18" TO PREVENT OVERFLOW AROUND DAM.



'L' = THE DISTANCE SUCH THAT POINTS 'A' AND 'B' ARE OF EQUAL ELEVATION.



CHECK DAMS

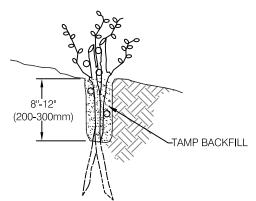
Wastewater SPECIFICATIONS Little Rock

Drawing Status: APPROVED Updated: 7/22/2009 10:41:01 AM Prepared By: Evangeline O'Neal

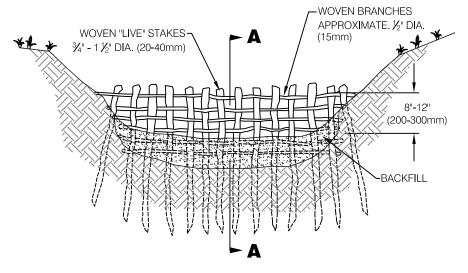
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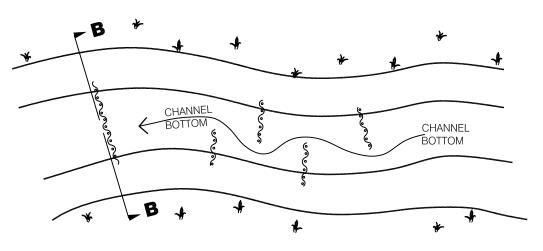
WILLOW CUTTING AND PLANTING SHOULD BE PERFORMED WHEN PLANT MATERIAL IS DORMANT.



SECTION A - A

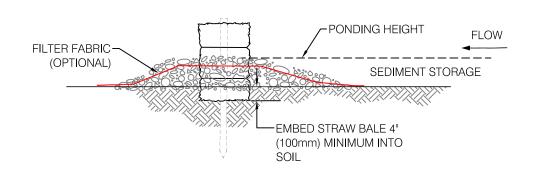


SECTION B - B

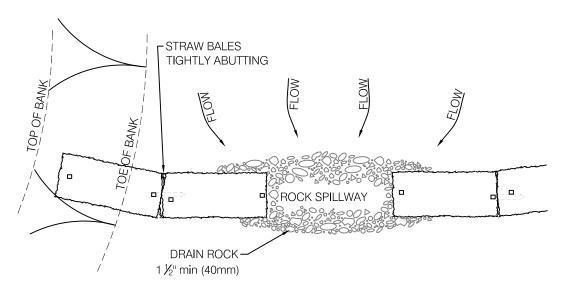


WOVEN WILLOW (LIVE) CHECKDAMS ACT AS VELOCITY DISSIPATORS TO REDUCE GULLY DOWNCUTTING

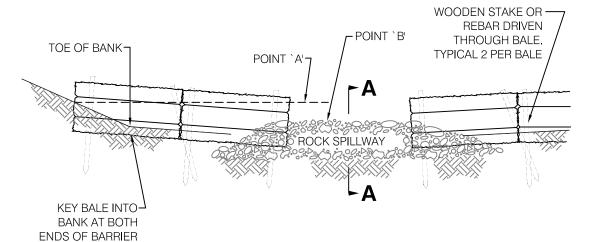
Notes



SECTION A - A



PLAN



VIEW LOOKING UPSTREAM

- 1. PLACE BALES PERPENDICULAR TO FLOW.
- 2. EMBED THE BALE 4" (100mm) INTO THE SOIL AND "KEY" THE END BALES INTO THE CHANNEL BANKS TO PREVENT FLOW AROUND THE BALES.
- 3. BALES PLACED IN A ROW WITH ENDS TIGHTLY ABUTTING.
- 4. POINT "A" SHALL BE HIGHER THAN POINT "B".
- 5. SPILLWAY HEIGHT SHALL NOT EXCEED 24" (0.6m).

- 1. THE STRAW BALES SHALL BE PLACED ON SLOPE CONTOUR.
- 2. BALES TO BE PLACED IN A ROW WITH THE ENDS TIGHTLY ABUTTING.
- 3. KEY IN BALES TO PREVENT EROSION OR FLOW UNDER BALES.

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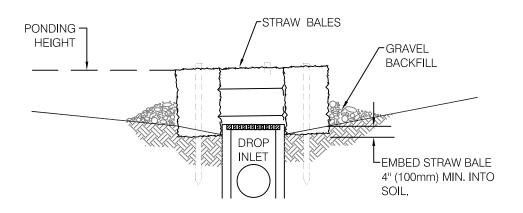
SPECIFICATIONS

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WOOD STAKES OR METAL REBAR STRAW BALES TIGHTLY STACKED OR OFFSET **CORNERS AS SHOWN** DRAIN GRATE **GRAVEL BACKFILL** LESS THAN-5% SLOPE

PLAN VIEW

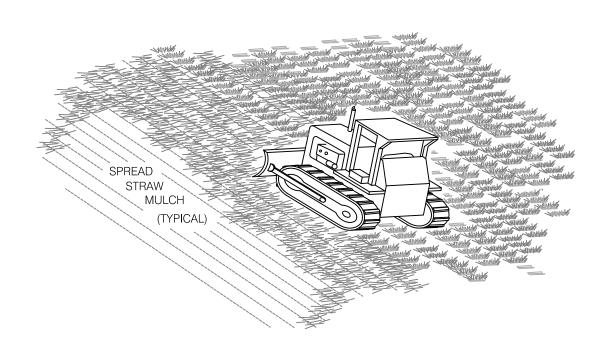


SECTION A-A

- 1. DROP INLET SEDIMENT BARRIERS ARE TO BE USED FOR SMALL, NEARLY LEVEL DRAINAGE AREAS. (LESS THAN 5%)
- 2. EMBED THE BALES 4" (100mm) INTO THE SOIL AND OFFSET CORNERS OR PLACE BALES WITH ENDS TIGHTLY ABUTTING. GRAVEL BACKFILL WILL PREVENT EROSION OR FLOW AROUND THE BALES.
- 3. THE TOP OF THE STRUCTURE (PONDING HEIGHT) MUST BE WELL BELOW THE GROUND ELEVATION DOWNSLOPE TO PREVENT RUNOFF FROM BYPASSING THE INLET. EXCAVATION OF A BASIN ADJACENT TO THE DROP INLET OR A TEMPORARY DIKE ON THE DOWNSLOPE OF THE STRUCTURE MAY BE NECESSARY.

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STRAW ANCHORING

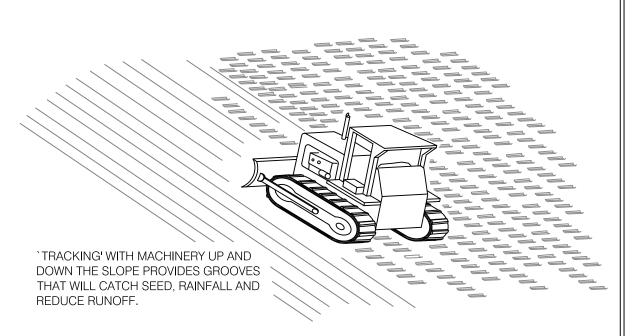
`TRACKING' WITH MACHINERY ON SANDY SOIL PROVIDES ROUGHENING WITHOUT UNDUE COMPACTION.

- 1. ROUGHEN SLOPE WITH BULLDOZER
- 2. BROADCAST SEED AND FERTILIZER.
- SPREAD STRAW MULCH 3" (76mm) THICK.
 (2½ TONS PER ACRE)
- 4. PUNCH STRAW MULĆH INTO SLOPE BY RUNNING BULLDOZER UP AND DOWN SLOPE.

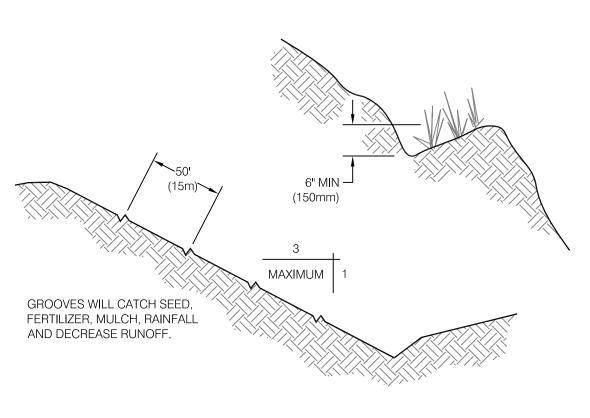
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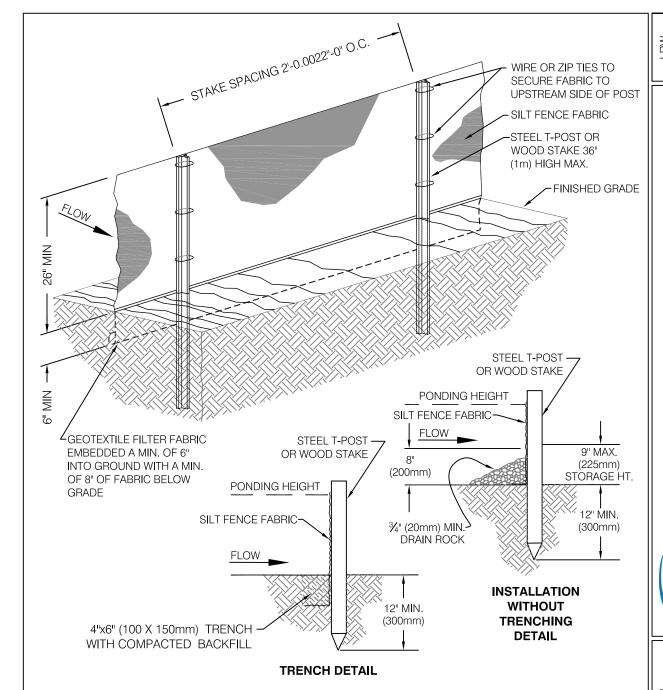
TRACKING



CONTOUR FURROWS

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- 1. SILT FENCE SHALL BE CONSTRUCTED BEFORE UPSLOPE GROUND COVER IS REMOVED. CLEARING, GRUBBING, AND STUMPING CAN OCCUR BEFORE SILT FENCE INSTALLATION IF GROUND COVER IS NOT REMOVED.
- 2. WHERE POSSIBLE, SILT FENCE SHALL BE PLACED ON THE FLATTEST AREA AVAILABLE.
- 3. A RUN OF SILT FENCE SHOULD FOLLOW THE CONTOUR AS CLOSE AS POSSIBLE WITH THE ENDS TURNED UPSLOPE TO POND WATER BEHIND THE FENCE.
- 4. THE STAKES SHALL BE PLACED ON THE DOWN SLOPE SIDE OF THE GEOTEXTILE. THE STAKES SHALL BE A MIN. OF 2x2 NOMINAL (1-½" x 1-½" ACTUAL) HARDWOOD STAKE OF SOUND QUALITY. T-POSTS MAY BE SUBSTITUTED IF GROUND CONDITIONS REQUIRE.
- 5. WHERE TWO SILT FENCE SECTIONS ARE COMBINED INTO ONE RUN THE END STAKES SHALL BE CONNECTED TOGETHER, NOT SIMPLY OVERLAPPED.
- 6. IF RUNOFF OVERTOPS THE SILT FENCE, FLOWS AROUND THE ENDS, OR IN ANY OTHER WAY BECOMES A CONCENTRATED FLOW, ONE OF THE FOLLOWING SHALL BE PERFORMED, AS APPROPRIATE: 1) AN ADDITIONAL RUN OF SILT FENCE SHALL BE PLACED UPSTREAM, 2) THE LAYOUT OF THE SILT FENCE SHALL BE CHANGED, 3) ACCUMULATED SEDIMENT SHALL BE REMOVED, OR 4) OTHER PRACTICES SHALL BE IMPLEMENTED.
- 7. INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN NECESSARY. MAX. RECOMMENDED STORAGE HEIGHT IS 9" (225mm).
- 8. REMOVED SEDIMENT SHALL BE DEPOSITED TO AN AREA THAT WILL NOT CONTRIBUTE SEDIMENT OFF-SITE AND CAN BE PERMANENTLY STABILIZED.

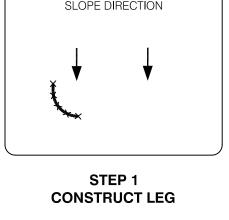
STEP 3

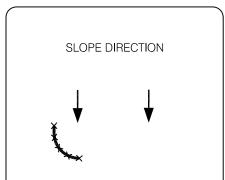
SLOPE DIRECTION

SLOPE DIRECTION

SLOPE DIRECTION

STEP 2 **CONSTRUCT DAM**



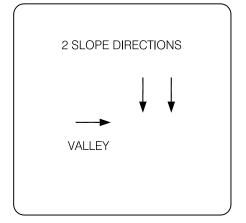


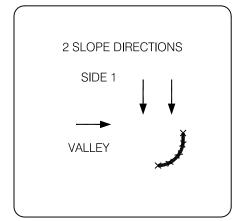
CONSTRUCT LEG 2

INSTALLATION WITH J-HOOKS OR `SMILES' INCREASE SILT FENCE EFFICIENCY.

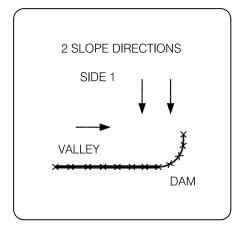
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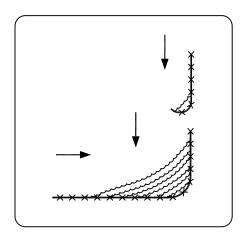




STEP 1 **CONSTRUCT A DAM**



STEP 2 **CONSTRUCT SIDE 2**

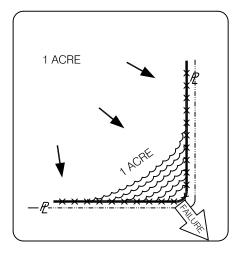


STEP 3 **CONSTRUCT J-HOOKS AS NEEDED**

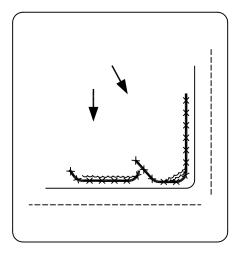
INSTALLATION WITH J-HOOKS WILL INCREASE SILT FENCE EFFICIENCY AND REDUCE **EROSION-CAUSING FAILURES.**

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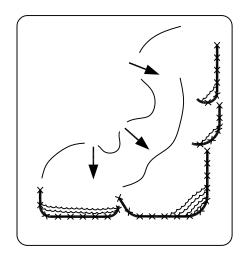
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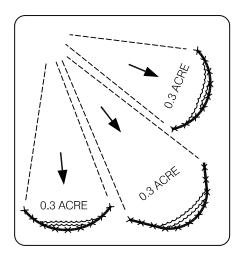


Incorrect - Do Not layout "perimeter control" silt fences along property lines. All sediment laden runoff will concentrate and overwhelm the system.



Correct - Install J-hooks





Discreet segments of silt fence, installed with J-hooks or `smiles' will be much more effective.



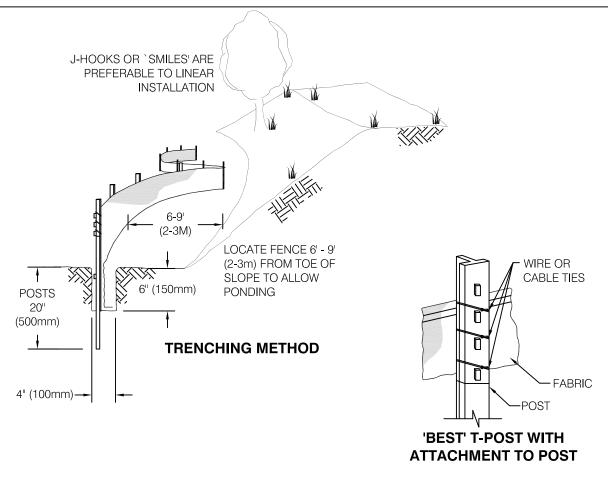
SILT FENCE NSTALLATION

Little Rock Wastewater SPECIFICATIONS

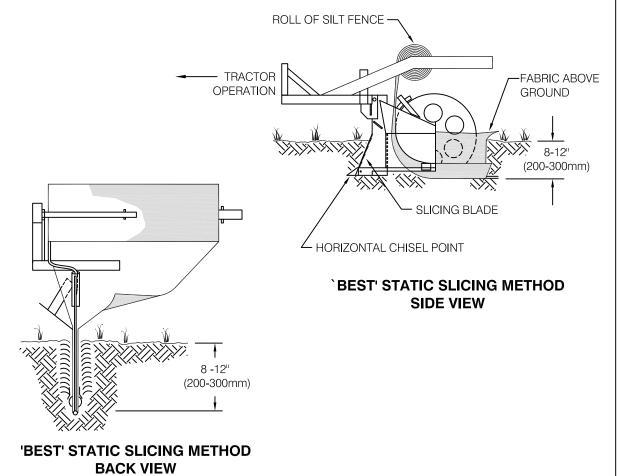
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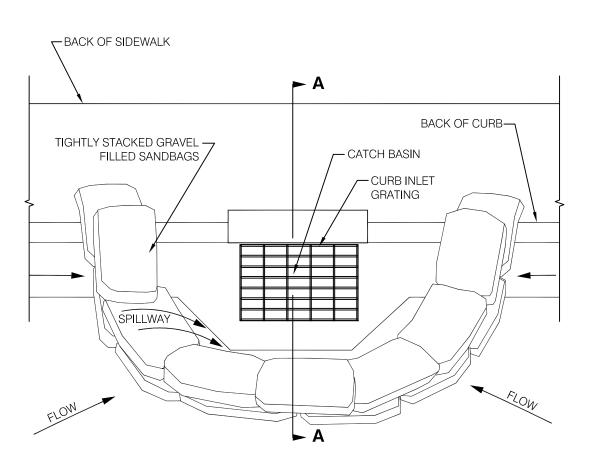


USE STEEL T-POST IF CANNOT ACHIEVE 500mm DEPTH WITH WOOD POSTS.

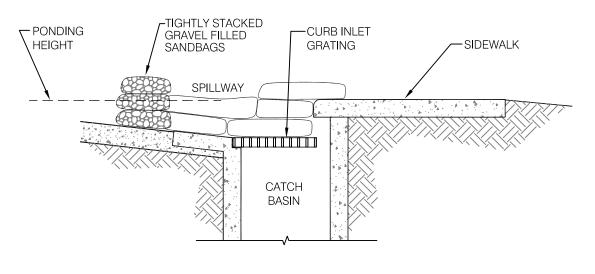


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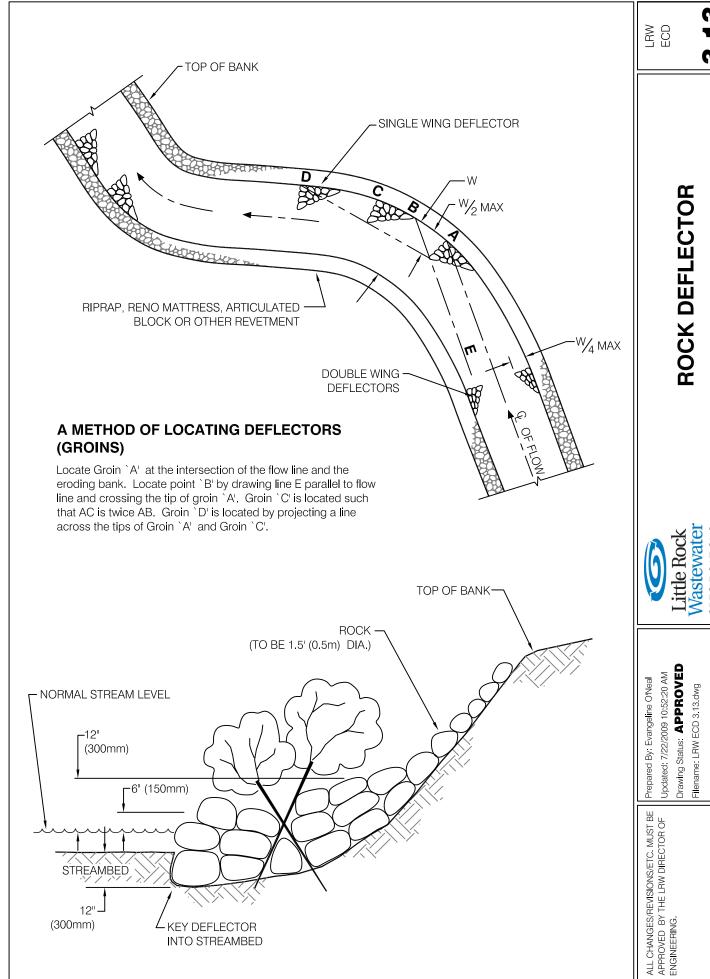


PLAN VIEW



SECTION A - A

- 1. PLACE CURB TYPE SEDIMENT BARRIERS ON GENTLY SLOPING STREET SEGMENTS WHERE WATER CAN POND AND ALLOW SEDIMENT TO SEPARATE FROM RUNOFF.
- SANDBAGS, OF EITHER BURLAP OR WOVEN GEOTEXTILE FABRIC, ARE FILLED WITH GRAVEL, LAYERED AND PACKED TIGHTLY.
- LEAVE ONE SANDBAG GAP IN THE TOP ROW TO PROVIDE A SPILLWAY FOR OVERFLOW.
- INSPECT BARRIERS AND REMOVE SEDIMENT AFTER EACH STORM EVENT. SEDIMENT AND GRAVEL MUST BE REMOVED FROM THE TRAVELED WAY IMMEDIATELY.



CROSS SECTION

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CLASS 1 OR CLASS 2 **DESIGNED STONE SIZE** SMOOTH FOUNDATION **UNDER FILTER** FILTER FABRIC OR SAND AND GRAVEL FILTER 6" (150mm) MIN. THICK KEYWAY AT TOE OF SLOPE

TYPICAL SECTION

- "T" = THICKNESS: THICKNESS SHALL BE DETERMINED BY THE ENGINEER.
- MIN. THICKNESS SHALL BE 1.5x THE MAX. STONE DIA. (NEVER LESS THAN 6" (150mm).

*N*astewater SPECIFICATIONS jttle Rock

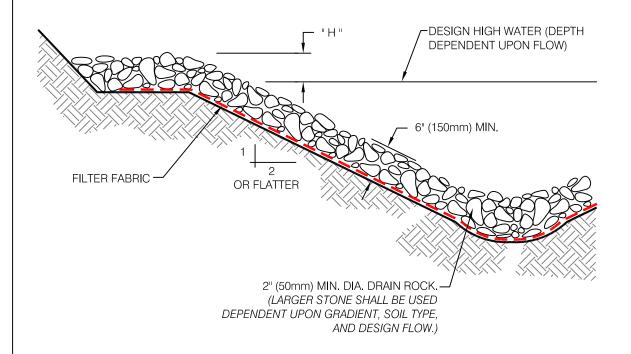
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DESIGN HEIGHT (" H "), WIDTH AND STONE SIZE SHALL BE DETERMINED BY THE ENGINEER

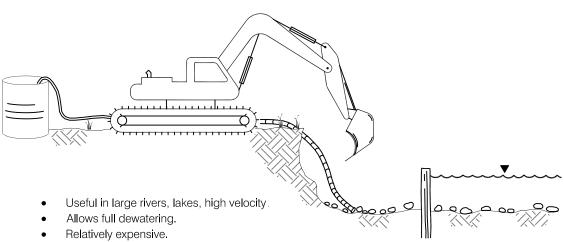


TYPICAL SECTION

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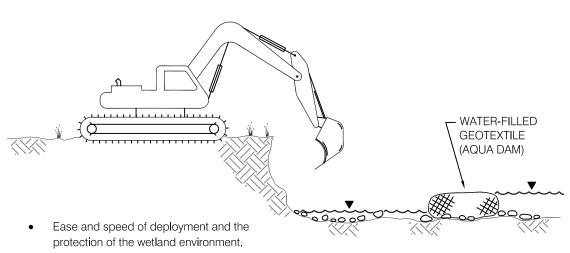
Notes



Not really appropriate for small streams.

Requires staging and heavy equipment access areas.

SHEET PILE ENCLOSURES



- Allows partial dewatering.
- Construction and repairs to seawalls and groins.
- Silt containment and sediment collection.
- Can be designed for small streams to large rivers.
- Erosion control through diversion or containment.
- Moderately expensive.

WATER-FILLED GEOTEXTILE (AQUA DAM)

LRW ECD

EROSION AND SEDIMENT CONTROL ISOLATION TECHNIQUES **IN-STREAM**



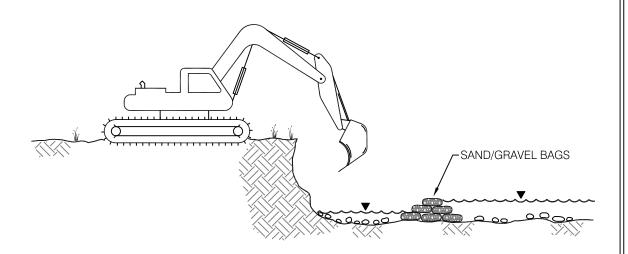
Nastewater SPECIFICATIONS

Drawing Status: APPROVED Updated: 7/22/2009 10:55:02 AM Prepared By: Evangeline O'Neal

Filename: LRW ECD 3.17 dwg

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- Inexpensive.
- Difficult to dewater.
- Labor intensive to install and remove.
- Sand may be deposited in stream if bags break, better to use clean gravel.

SAND BAG/GRAVEL BAG TECHNIQUE

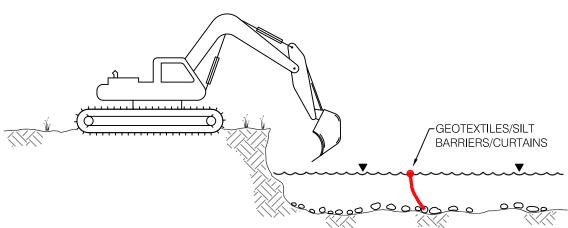
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Temporary, portable Coffer Dam, water diversion or fluid retention system for use in open water up to 12 feet deep.

Free standing - many types

- available.
- Easy installation.
- Allows partial dewatering.
- Can be designed for large and small streams.
- Relatively expensive.

COFFER DAMS

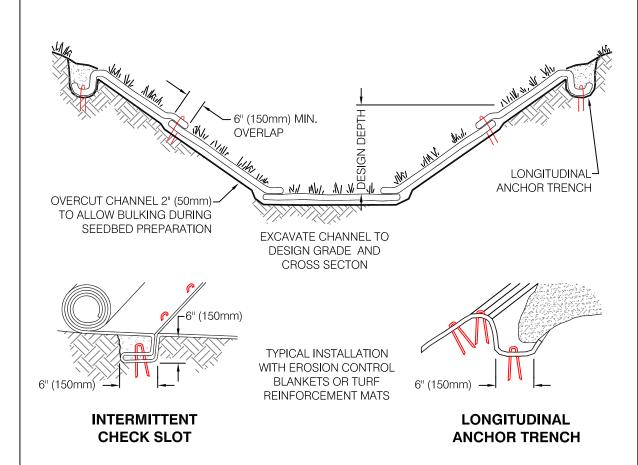


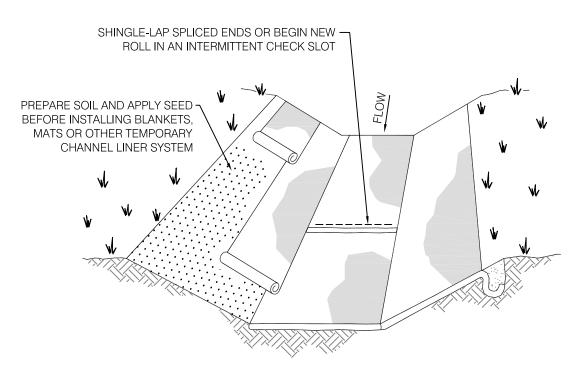
- Used in slow water or lakes only.
- Inexpensive.
- Does not allow dewatering.
- Not very effective especially when removing.

GEOTEXTILES, SILT BARRIERS, CURTAINS

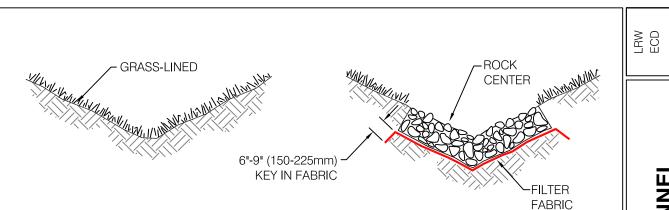
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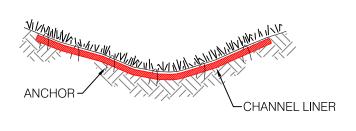


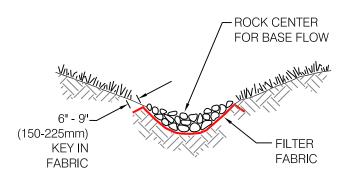


- DESIGN VELOCITIES EXCEEDING 2-FT/SEC (0.5m/sec) REQUIRE TEMPORARY BLANKETS, MATS OR SIMILAR LINERS TO PROTECT SEED AND SOIL UNTIL VEGETATION BECOMES ESTABLISHED.
- GRASS-LINED CHANNELS WITH DESIGN VELOCITIES EXCEEDING 6-FT/SEC (2m/sec) SHOULD INCLUDE TURF REINFORCEMENT MATS.

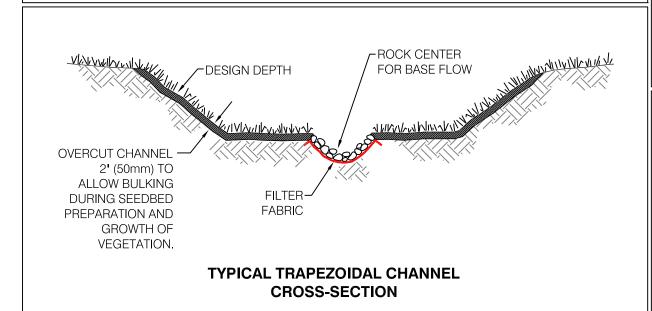


TYPICAL V-SHAPED CHANNEL CROSS-SECTIONS





TYPICAL PARABOLIC CHANNEL CROSS-SECTIONS



GRASS-LINED CHANNEL IYPICAL CROSS SECTIONS

Little Rock
Wastewater
SPECIFICATIONS

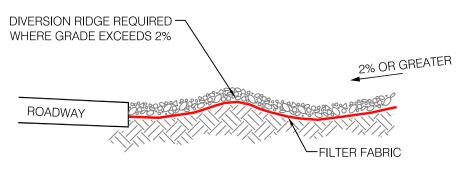
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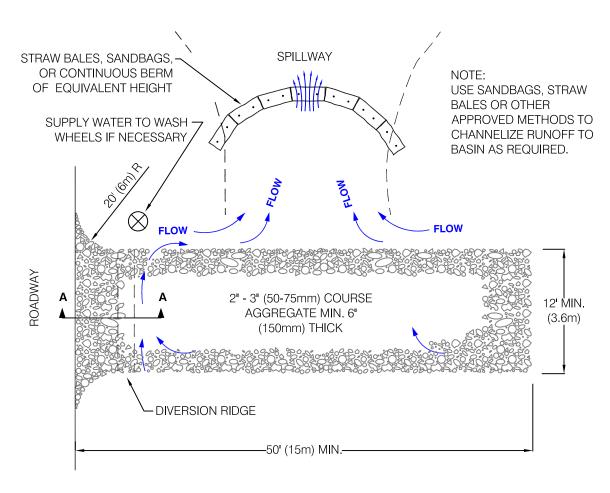
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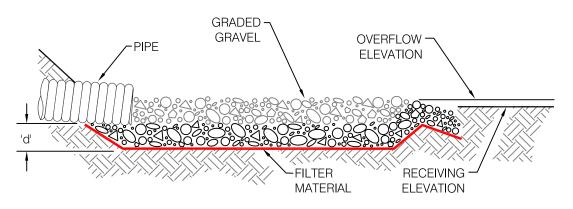
SECTION A - A



PLAN

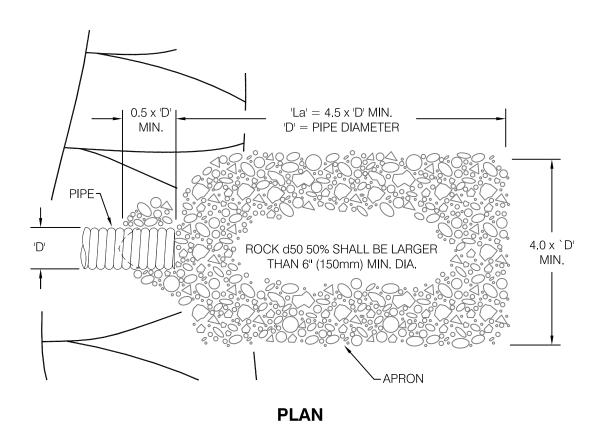
- THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT.
- 2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY.
- WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.

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THICKNESS ('d') = 1.5 x MAX. ROCK DIAMETER - 6" (150mm) MIN.

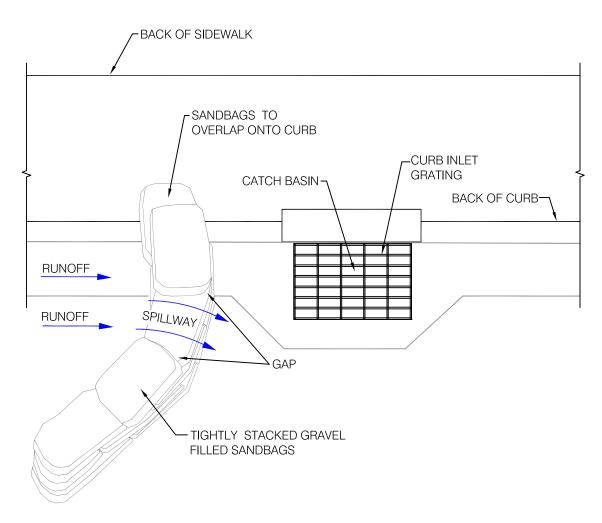
SECTION



- 'La' = LENGTH OF APRON. DISTANCE 'La' SHALL BE OF SUFFICIENT LENGTH TO DISSIPATE ENERGY.
- 2. APRON SHALL BE SET AT A ZERO GRADE AND ALIGNED STRAIGHT.
- 3. FILTER MATERIAL SHALL BE FILTER FABRIC OR 6" (150mm) THICK MIN. GRADED GRAVEL LAYER.

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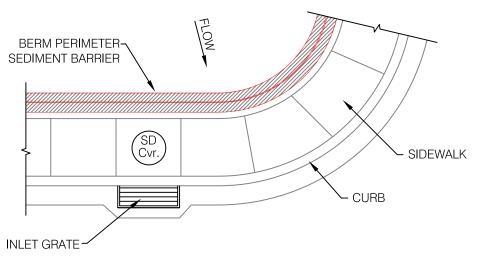
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PLAN VIEW

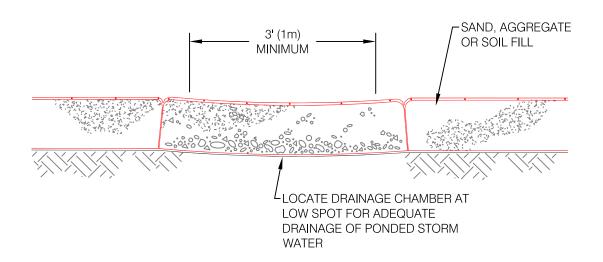
- PLACE CURB TYPE SEDIMENT BARRIERS ON GENTLY SLOPING STREET SEGMENTS, WHERE WATER CAN POND AND ALLOW SEDIMENT TO SEPARATE FROM RUNOFF.
- 2. SANDBAGS OF EITHER BURLAP OR WOVEN 'GEOTEXTILE' FABRIC, ARE FILLED WITH GRAVEL, LAYERED AND PACKED TIGHTLY.
- 3. A GAP EQUIVALENT TO 'ONE SANDBAG' IN THE TOP ROW TO PROVIDE A SPILLWAY FOR OVERFLOW.
- 4. INSPECT BARRIERS AND REMOVE SEDIMENT AFTER EACH STORM EVENT. SEDIMENT AND GRAVEL MUST BE REMOVED FROM THE TRAVELED WAY IMMEDIATELY.

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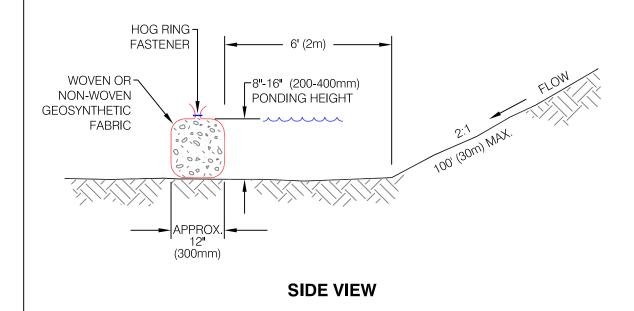


TYPICAL APPLICATION

PERIMETER SEDIMENT BARRIER

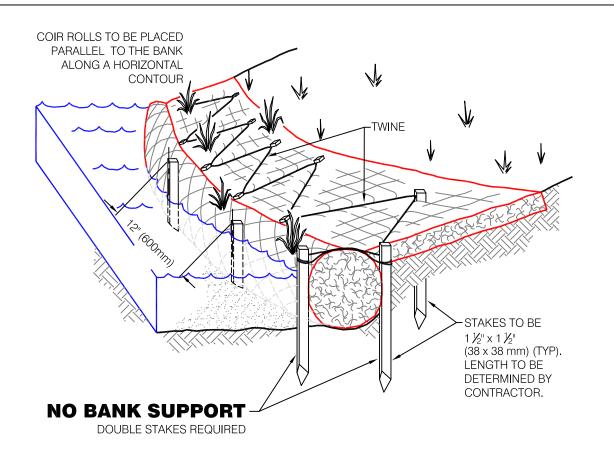


FRONT VIEW

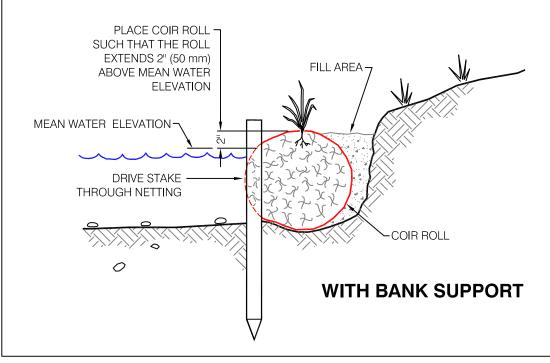


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Drawing Status:



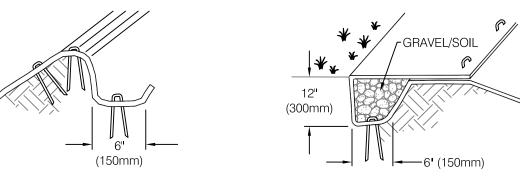
- COIR ROLLS: EASY TO INSTALL; PREPARE SOIL, INCLUDING CLEANING ALL THE WEEDS (SPRAY A HERBICIDE IF NECESSARY) AND GRADING. THE SURFACE OF THE SOIL SHOULD BE SMOOTH AND FREE OF ROCKS, ROOTS AND OTHER OBSTRUCTIONS.
- 2. COIR MATS: ROLL THE MAT ACROSS THE SLOPE; START AT THE TOP OF THE SLOPE BY ANCHORING THE MAT IN A 6" DEEP AND 6" WIDE ANCHOR TRENCH; STAPLE (8" METAL STAPLES OR 12" WOODEN WEDGES ARE RECOMMENDED); BACKFILL AND COMPACT; CUT A WHOLE IN THE MAT WHERE NEED TO PLANT PERENNIAL GROUND COVERS.
- DRY COIR ROLLS HAVE MORE STRENGTH AND DURABILITY THAN VEGETATED COIR ROLLS; SLOW DEGRADING COIR FIBER LAST LONGER PROVIDING EROSION PROTECTION, THEREBY ALLOWING SUFFICIENT TIME TO ESTABLISH A SUSTAINABLE VEGETATION IN FIELD CONDITIONS.
- CHOOSE STRONG AND BIODEGRADABLE COIR PRODUCTS FOR SEDIMENT CONTROL AND REDUCE TRASH HAULING AND WASTE DISPOSAL COSTS.



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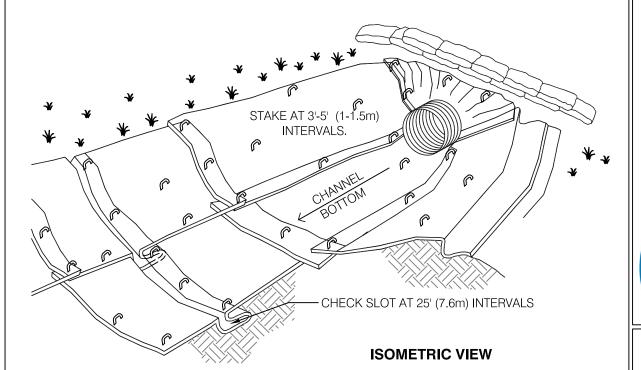
ALL CHANGES/REVISIONS/ETC. MUST BE APPROVED BY THE LRW DIRECTOR OF ENGINEERING.

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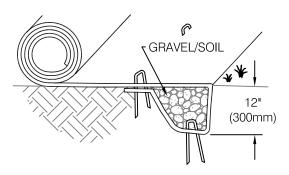
LONGITUDINAL ANCHOR TRENCH

TERMINAL SLOPE & CHANNEL ANCHOR TRENCH

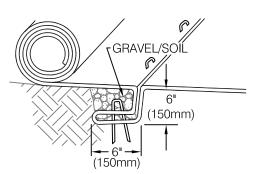


NOTES:

- 1. CHECK SLOTS TO BE CONSTRUCTED PER MANUFACTURERS SPECIFICATIONS.
- 2. STAKING OR STAPLING LAYOUT PER MANUFACTURERS SPECIFICATIONS.



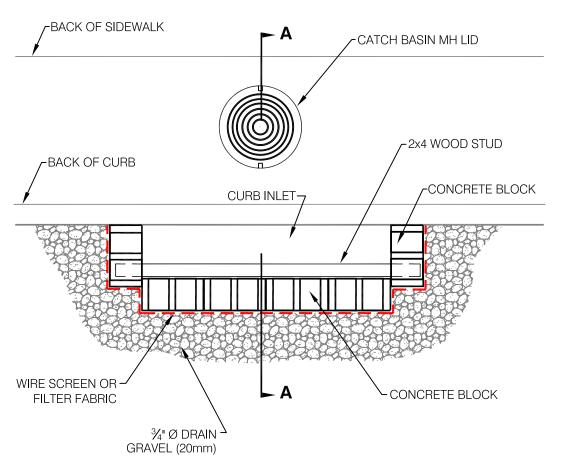
INITIAL CHANNEL ANCHOR TRENCH



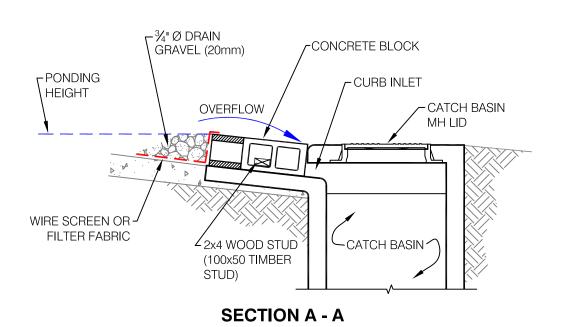
INTERMITTENT CHECK SLOT

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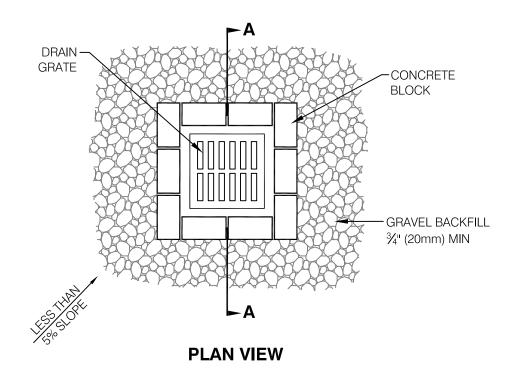
PLAN VIEW

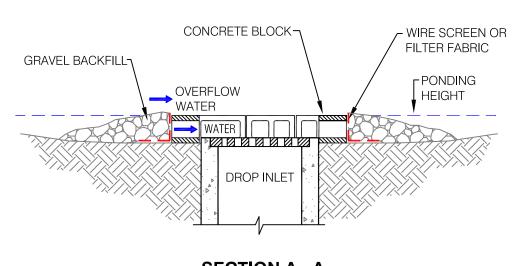


- USE BLOCK AND GRAVEL TYPE SEDIMENT BARRIER WHEN CURB INLET IS LOCATED IN GENTLY SLOPING STREET SEGMENT, WHERE WATER CAN POND AND ALLOW SEDIMENT TO SEPARATE FROM RUNOFF.
- 2. BARRIER SHALL ALLOW FOR OVERFLOW FROM SEVERE STORM EVENT.
- INSPECT BARRIERS AND REMOVE SEDIMENT AFTER EACH STORM EVENT. SEDIMENT AND GRAVEL MUST BE REMOVED FROM THE TRAVELED WAY IMMEDIATELY.

Prepared By: Evangeline O'Neal

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SECTION A - A

- DROP INLET SEDIMENT BARRIERS ARE TO BE USED FOR SMALL, NEARLY LEVEL DRAINAGE AREAS. (LESS THAN 5%)
- EXCAVATE A BASIN OF SUFFICIENT SIZE ADJACENT TO THE DROP INLET.
- THE TOP OF THE STRUCTURE (PONDING HEIGHT) MUST BE WELL BELOW THE GROUND ELEVATION DOWNSLOPE TO PREVENT RUNOFF FROM BYPASSING THE INLET. A TEMPORARY DIKE MAY BE NECESSARY ON THE DOWNSLOPE SIDE OF THE STRUCTURE.