

PRACTICE 5.1: PUMP-AROUND DIVERSION

Dewatering practice for temporarily pumping flow around segments of the stream channel during construction

DESCRIPTION

This practice involves installing a temporary pump-around system and in-stream barriers to divert flow around sections or reaches of the stream.

APPROPRIATE USES

- Where construction activities require that a linear segment of the stream be dewatered and maintained in a dry condition.
- When restoration practices (such as PRACTICE 3.1: Rock Cross Vanes) that span the entire width of the stream are installed.
- For watersheds less than 1 square mile in size.

LIMITATIONS

- Amount of flow capable of being diverted is determined by the capacity of the pump and the height of the in-stream barriers.
- Costs are proportional to diversion requirements.
- Pumps can break down and cause delays.

DESIGN REQUIREMENTS AND PROCEDURES

- Pump selection requires the computation of Total Dynamic Head (TDH):  
TDH = static suction lift + static discharge head + friction loss + velocity head (Godwin 2003).
- Height of in-stream barriers shall be the normal base flow depth + 1 foot of freeboard for pump-around diversions that will be installed and removed in the same workday.
- Height of in-stream barriers for a continuous pump-around shall be the 2-year storm elevation + 1 foot of freeboard. The minimum in-stream barrier height is 2 feet.
- Always requires a pump with a capacity greater than that required to pump the desired flow.

MATERIAL SPECIFICATIONS

- In-stream Barrier:** Either riprap per Specification 3.19: Riprap of the Virginia Erosion and Sediment Control Handbook or sandbags. Sandbags may be filled on site or pre-filled and made of burlap or polypropylene materials which are resistant to ultra-violet radiation, tearing, and puncture and should be woven tightly enough to prevent leakage of the fill material (i.e., sand, fine gravel, etc.).
- Sheeting:** Seamless polyethylene plastic sheeting with a minimum 4-mil thickness impervious and resistant to puncture, tearing and ultraviolet degradation or equivalent.

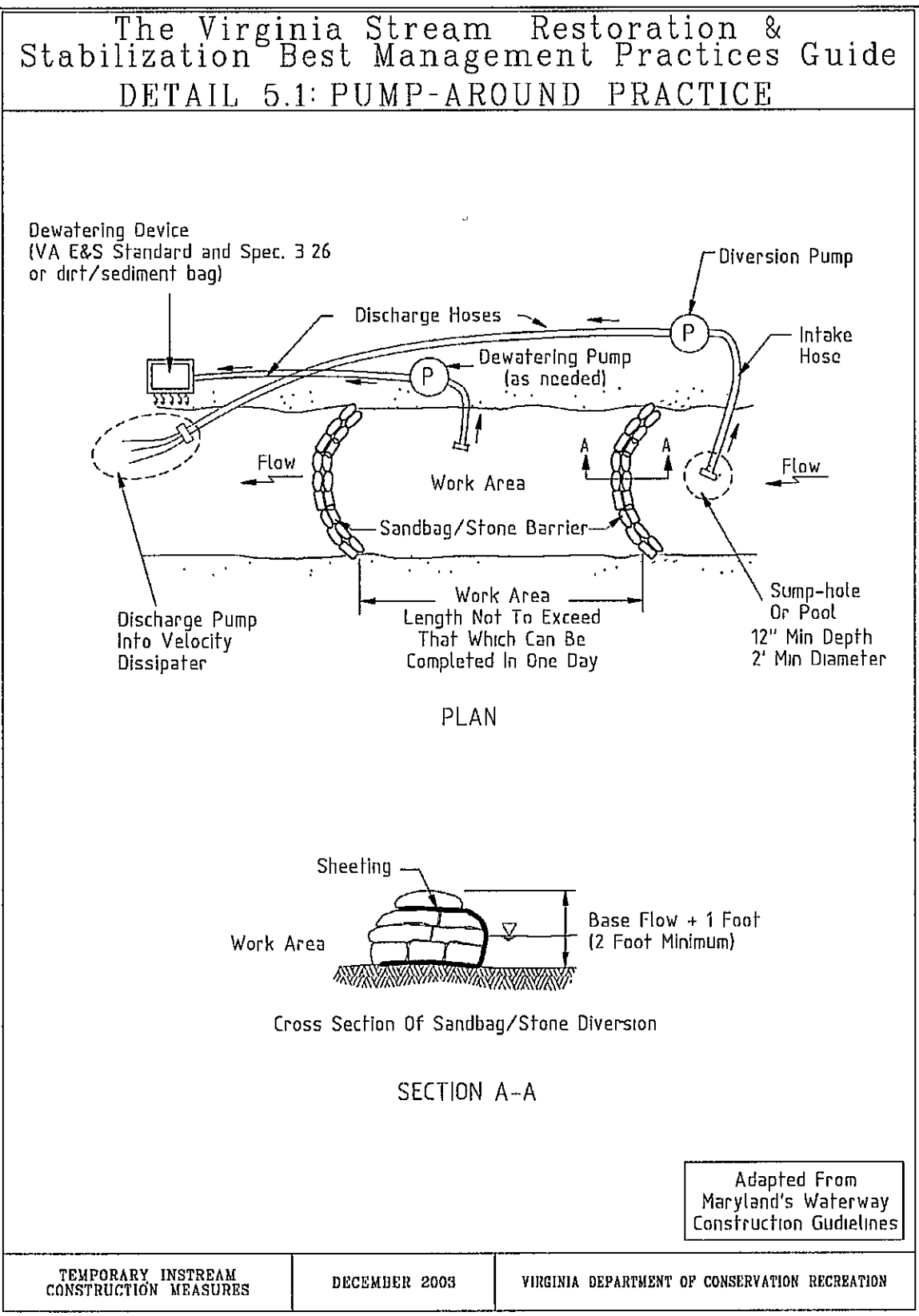
- Pumping Equipment:** Electric, diesel or gasoline venturi, vacuum, or centrifugal primed pump. Appropriately sized rigid intake and discharge pipe/hose with positive restrained joints. Necessary connectors and properly stored fuel.
- Dewatering Structure:** Per Standard and Specification 3.26 in the Virginia Erosion and Sediment Control Handbook or sediment/dirt bag per manufacturers specifications.
- Velocity Dissipater:** Riprap or sandbag lined "plunge pool" sized to be non-erosive at the discharge pipe velocity.

CONSTRUCTION RECOMMENDATIONS

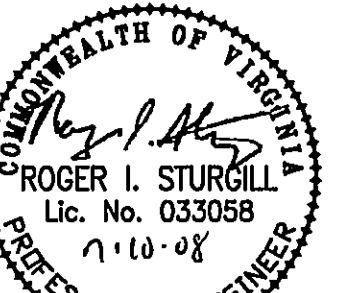
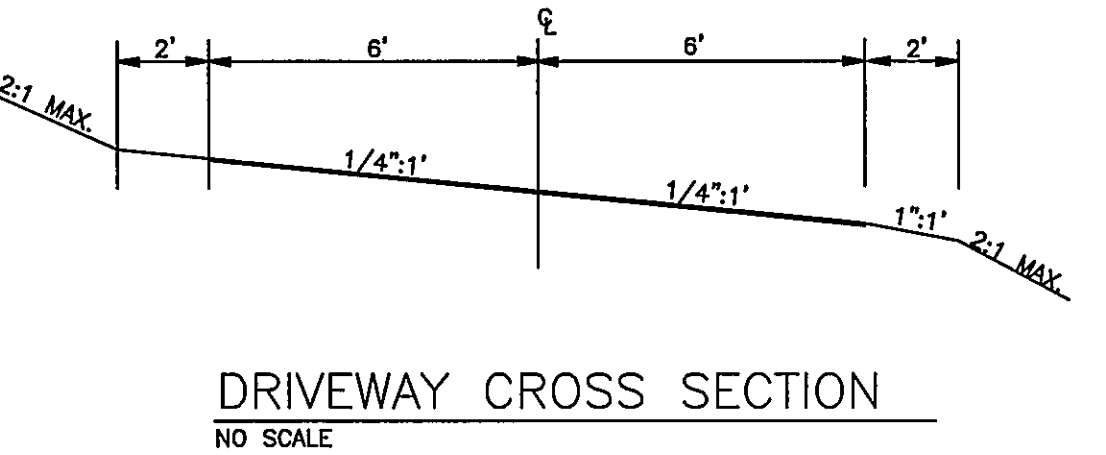
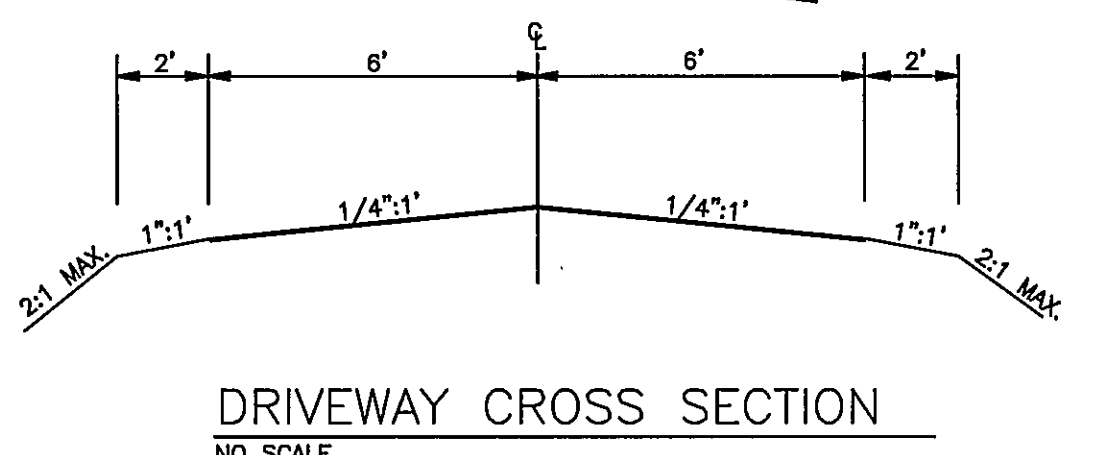
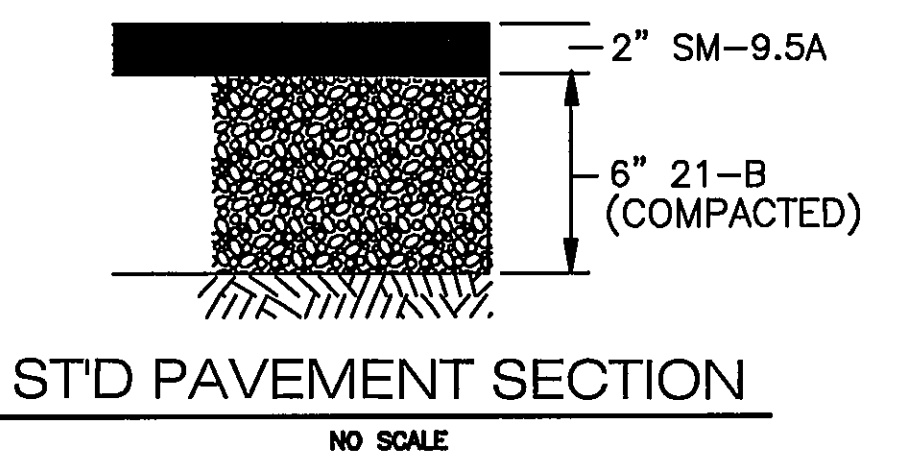
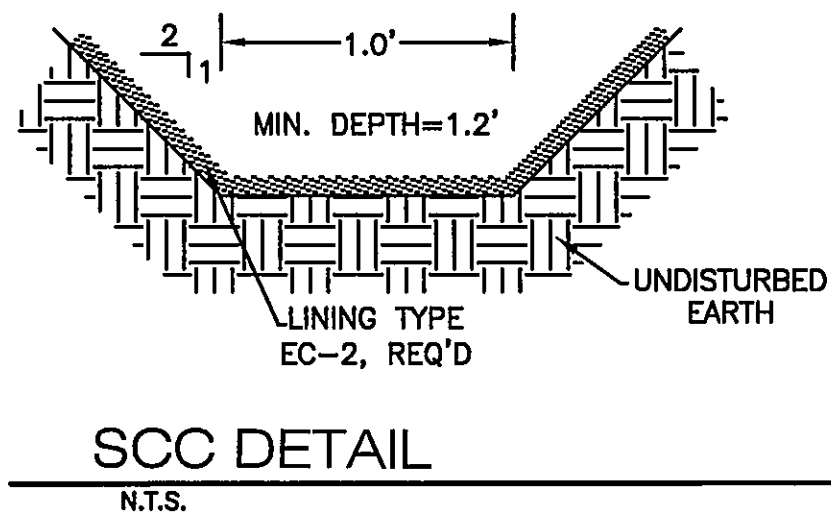
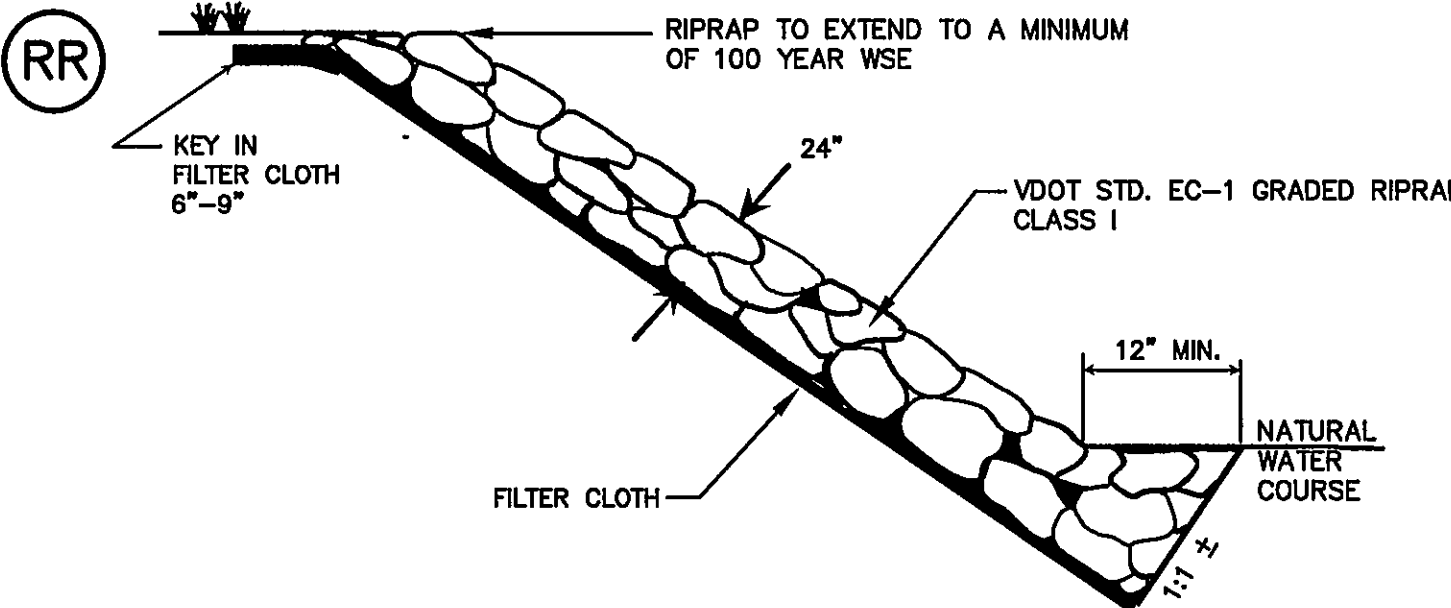
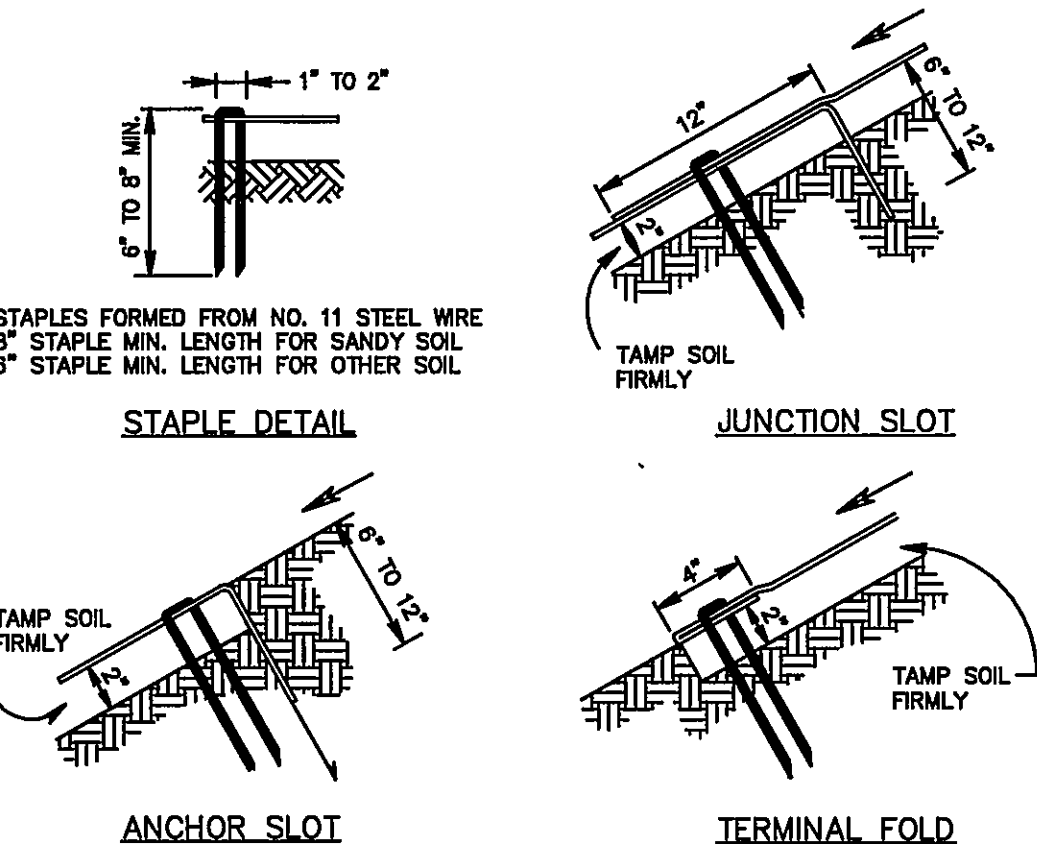
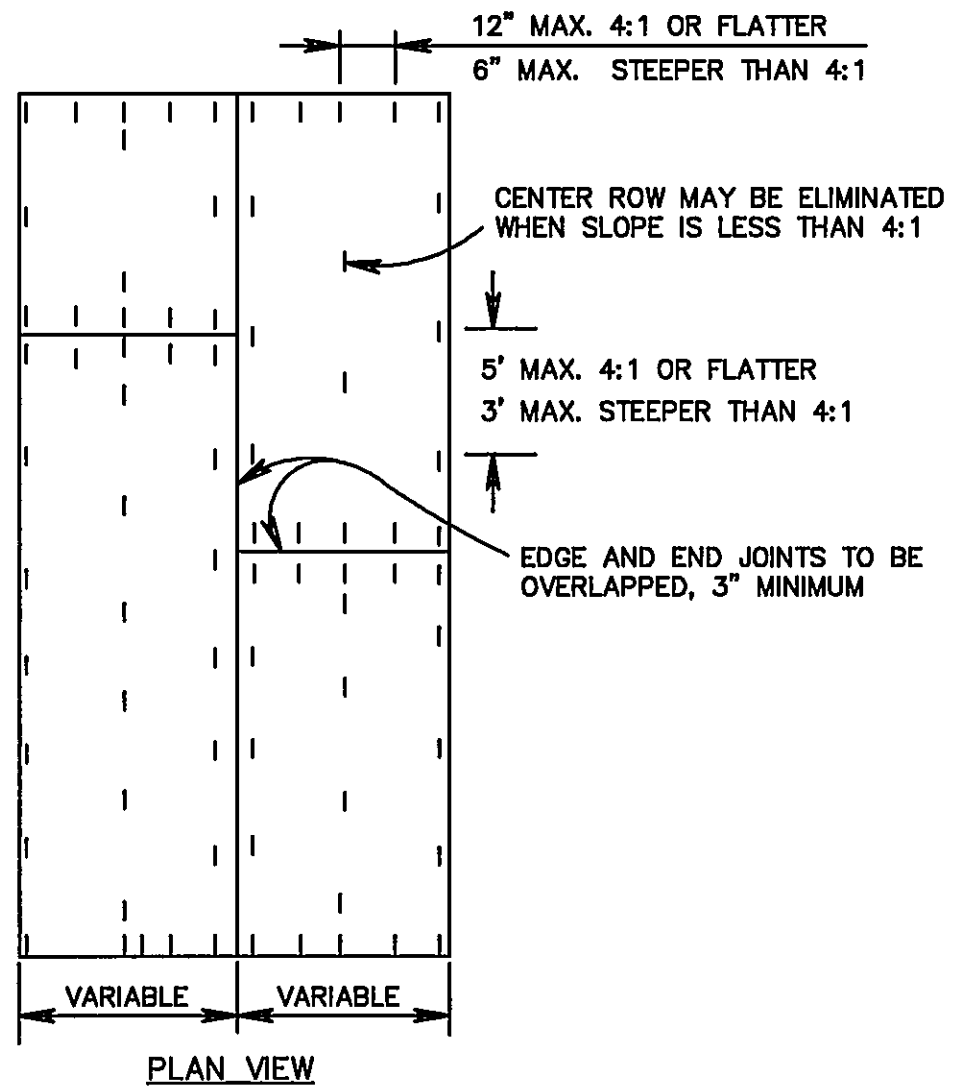
- Sandy material may be used to fill sandbags. If permitted, material from the channel may be used to fill the bags.
- The length of stream dewatered should be determined by the amount of work that can be completed in one workday. Continuous pumping adds increased costs and risks of failure and delays.
- Where possible, utilize existing pools within the stream in place of an excavated sump-hole.
- Strategic placement of the in-stream barrier can eliminate multiple installations during construction.
- Remove all large debris located within the foundation of the barrier to ensure proper sealing and reduce leakage through the barrier.
- Sandbag/stone barrier should be monitored daily for leakage and repaired as necessary.

INSTALLATION GUIDELINES

- Excavate sump hole or identify existing pool upstream of the work area.
- Install velocity dissipater downstream of the work area.
- Set up pump and hose/pipe.
- Install upstream and downstream barriers and start pump.
- Use de-watering pump and dewatering device to remove water left between the in-stream barriers after primary pump installation and as needed during construction.
- Complete in-stream construction activities and remove in-stream barriers.
- Restore/repair impacted stream areas.



SOIL STABILIZATION BLANKET  
\*\*TO BE USED ON ALL SLOPES 3:1 OR STEEPER



1208 Corporate Circle  
Roanoke, Virginia 24018  
Phone: 540/772-9580  
FAX: 540/772-8050

501 Branchway Road  
Richmond, Virginia 23288  
Phone: 804/784-0671  
FAX: 804/784-2028

880 Technology Park Drive  
Suite 200  
Glenn Allen, Virginia 23069  
Phone: 804/553-0132  
FAX: 804/553-0133

448 Peppers Ferry Road, NW  
Christiansburg, Virginia 24073  
Phone: 540/381-4290  
FAX: 540/381-4291

1581 Commerce Road  
Suite 401  
Verona, Virginia 24482  
Phone: 540/248-2820  
FAX: 540/248-3251

RESUB. HANGING ROCK TERRACE UTILITY LOT  
DETAILS  
CATAWBA DISTRICT  
ROANOKE COUNTY, VIRGINIA

DRAWN BY: A.J.S.  
DESIGNED BY: A.J.S.  
CHECKED BY: S.M.H.  
DATE: 05-28-2008  
REVISIONS:  
06-18-2008

SCALE: AS SHOWN  
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