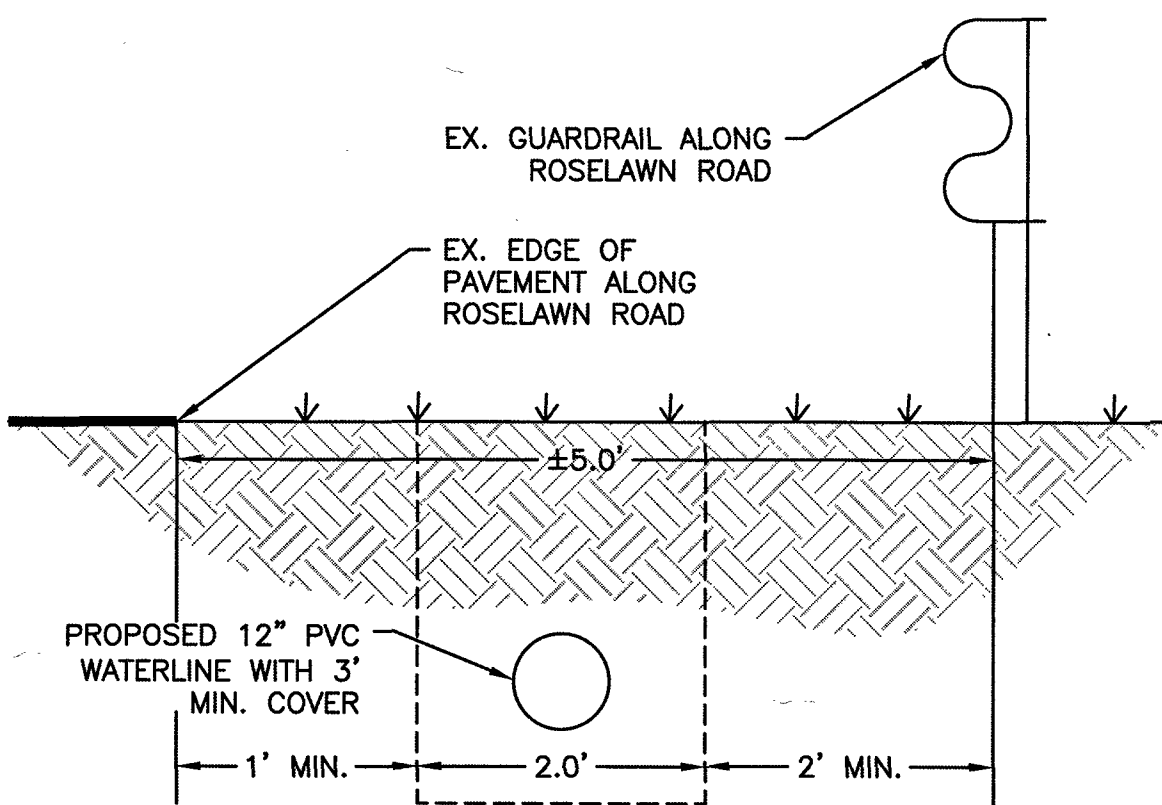
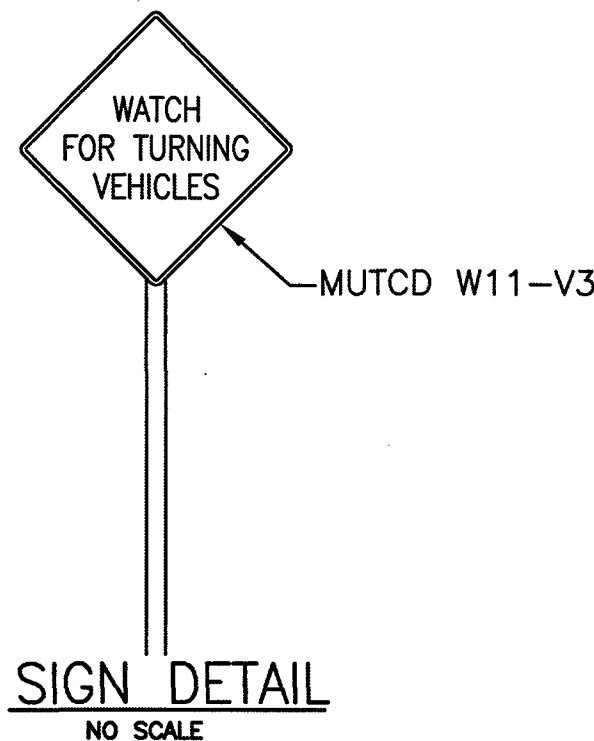


SCALE: 1" = 40'



TYPICAL WATERLINE INSTALLATION
ALONGSIDE GUARDRAIL:
NO SCALE



WATERLINE INSTALLATION NOTES:

- PER AGREEMENT BETWEEN THE DEVELOPER AND THE WWA, THE WWA WILL CONSTRUCT THE PROPOSED WATERLINE STARTING AT THE POINT OF CONNECTION TO THE EXISTING WATERLINE AT THE EASTERN END OF THE PROJECT AND INCLUDING ALL WATERLINE CONSTRUCTION SHOWN ON THIS SHEET ALONG ROSELAWN ROAD. THE WWA SHALL INSTALL A 12"x8" TEE WITH AN 8" G.V. TO SERVE THE SUBDIVISION. THE DEVELOPER'S CONTRACTOR WILL BEGIN AT THIS G.V. AND BE RESPONSIBLE FOR CONSTRUCTING THE NEW WATERLINE ACROSS ROSELAWN ROAD AND THROUGHOUT THE DEVELOPMENT.
- THE PROPOSED 12" WATERLINE ALONG ROSELAWN ROAD SHALL BE DUCTILE IRON PRESSURE PIPE (DIP) OF THE PUSH-ON JOINT OR MECHANICAL JOINT VARIETY, CONFORMING TO ANSI/AWWA C151, LATEST REVISION. MINIMUM PRESSURE CLASS (PC) SHALL BE 350, MINIMUM THICKNESS CLASS SHALL BE 50.
- G.C. SHALL ENSURE THAT CONSTRUCTION FOR THE PROPOSED WATERLINE EXTENSION IS LIMITED TO THE EXISTING EASEMENT.
- G.C. SHALL ENSURE THAT ALL NECESSARY PERMITS ARE IN PLACE PRIOR TO ANY WORK WITHIN THE EXISTING CREEK FOR THE PROPOSED WATERLINE EXTENSION. A COPY OF THE PERMIT SHALL BE KEPT ON-SITE AND ALL WORK WITHIN THE CREEK SHALL CONFORM TO THE REQUIREMENTS OF THE PERMIT.
- SANDBAGS SHALL BE INSTALLED UPSTREAM OF THE WORK AREA IN THE CREEK AND A PUMP-AROUND SYSTEM UTILIZED AS NECESSARY TO ALLOW WATERLINE CONSTRUCTION TO OCCUR IN THE DRY.
- WATERLINE INSTALLATION UNDER THE CREEK BED SHALL BE COMPLETED IN A TIMELY FASHION TO LIMIT THE AMOUNT OF TIME THAT THE CREEK REMAINS DISTURBED.
- ANY GUARDRAIL THAT IS TEMPORARILY REMOVED FOR WATERLINE CONSTRUCTION SHALL BE RE-INSTALLED IMMEDIATELY WHEN WORK IS NOT TAKING PLACE OR A TEMPORARY CRASH WORTHY DEVICE MUST BE PROVIDED UNTIL SUCH TIME AS THE GUARDRAIL CAN BE RE-INSTALLED.
- DURING WATERLINE CONSTRUCTION ALONG ROSELAWN ROAD, THE NEAREST EDGE OF THE TRENCH MUST BE A MINIMUM OF TWO FEET FROM THE GUARDRAIL POSTS TO MAINTAIN THE STRUCTURAL INTEGRITY OF THE POSTS DURING CONSTRUCTION.
- THE G.C. SHALL REPLACE ANY PAVEMENT ALONG ROSELAWN ROAD, SOUTH ROSELAWN ROAD, AND ANY PRIVATE ENTRANCES THAT IS DAMAGED OR DISTURBED DURING WATERLINE CONSTRUCTION.
- THE G.C. SHALL COORDINATE PAVEMENT REPLACEMENT FOR THE PRIVATE DRIVEWAY WITH THE HOMEOWNER AS NECESSARY AND ENSURE THAT ACCESS IS MAINTAINED AT ALL TIMES.
- THE WATERLINE CROSSING ROSELAWN ROAD SHALL BE INSTALLED BY BORE OR DIRECTIONAL DRILL.

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 (Gottwin 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 butyl or polypropylene materials which are resistant to ultraviolet 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 Dissipator:** Riprap or sandbag lined "plunge pool" sized to be non-erosive at the discharge pipe velocity.

CONSTRUCTION RECOMMENDATIONS

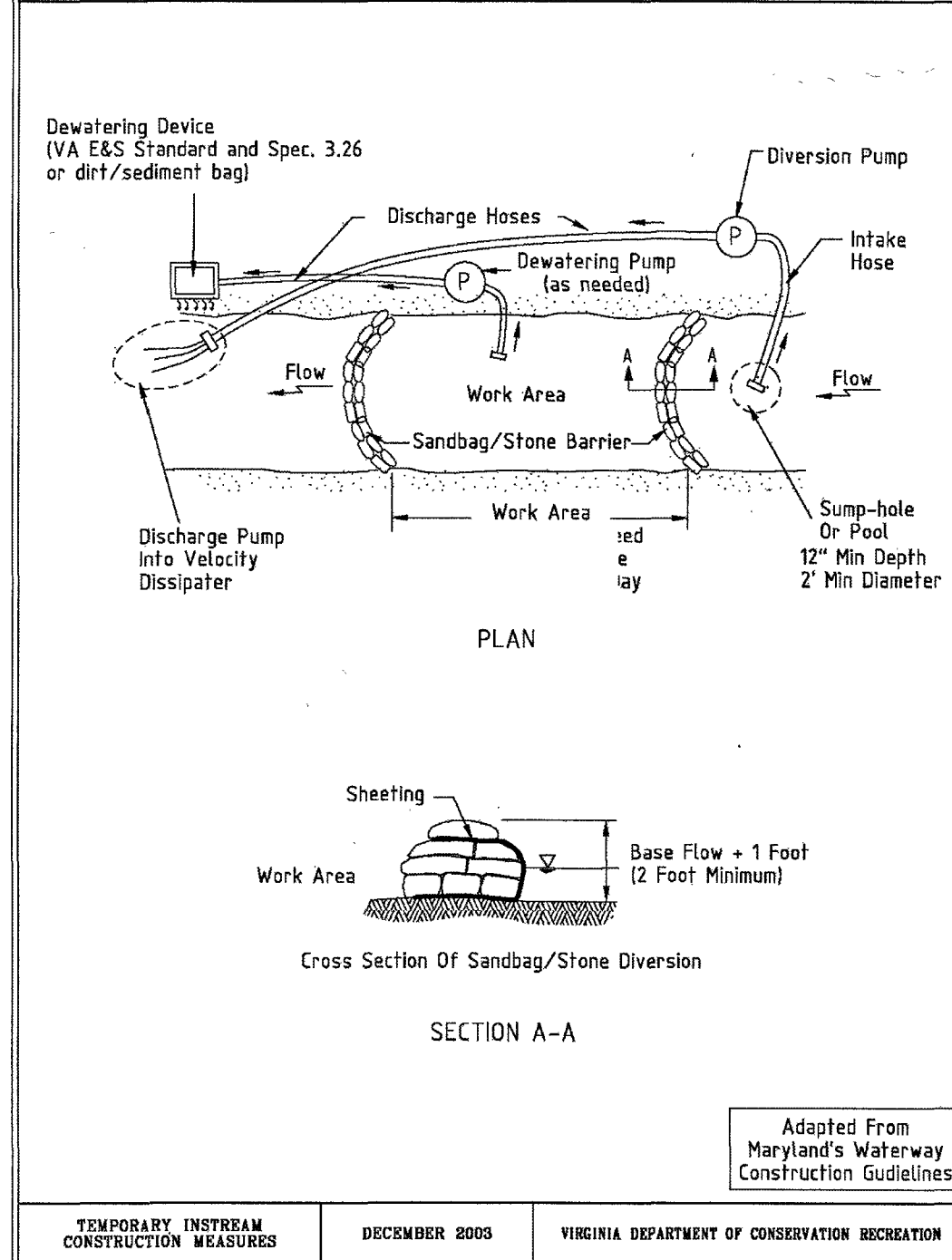
- Sandy material may be used to fill sandbags. If permitted, material from the channel may be used to fill the bags.
- The length of stream dewatered should be determined by the amount of work that can be completed in one workday. Continuous pumping adds increased costs and risks of failure and delays.
- 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

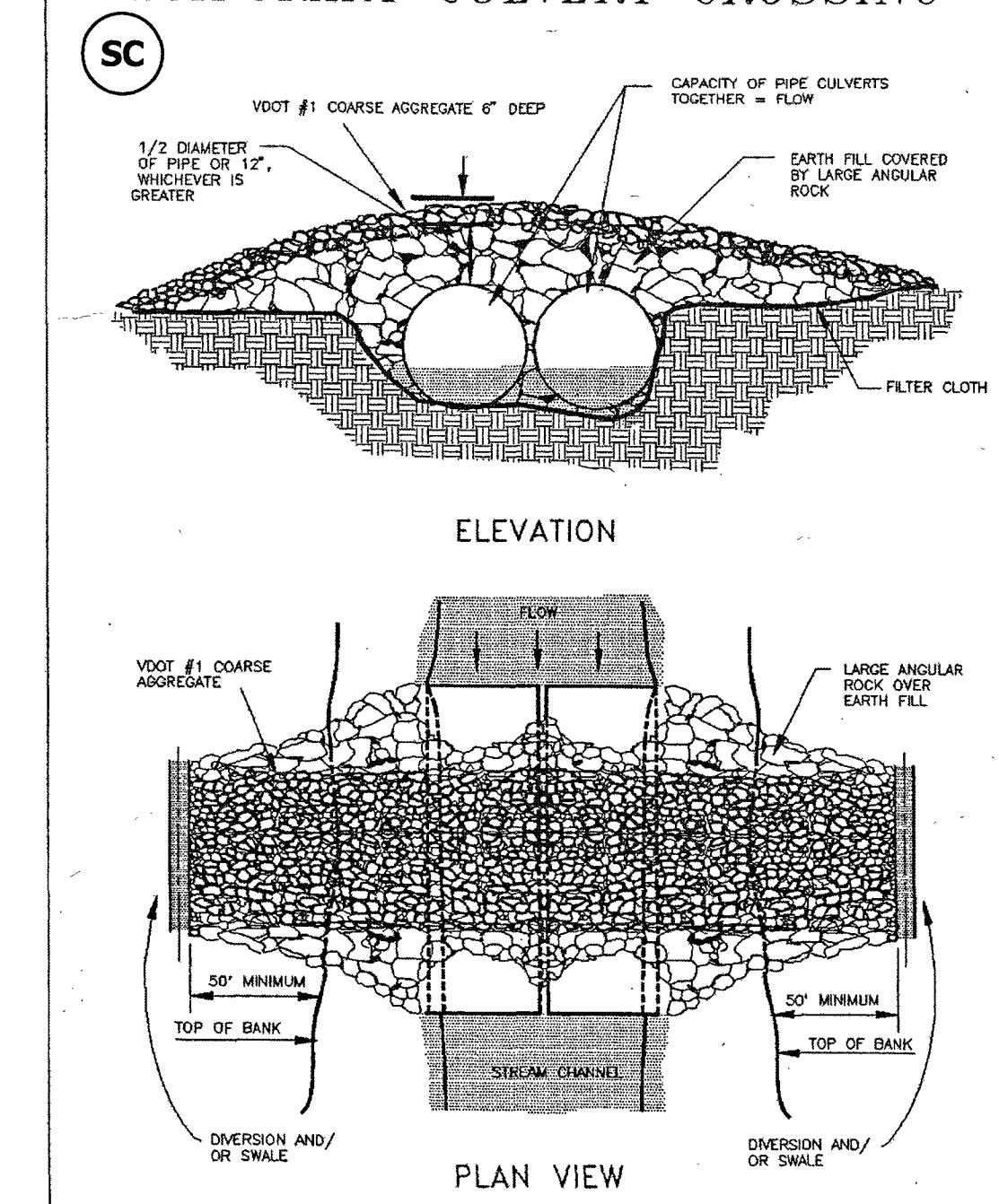
- Excavate sump hole or identify existing pool upstream of the work area.
- Install velocity dissipator downstream of the work area.
- Set up pump and hose/pipes.
- Install upstream and downstream barriers and start pump.
- Use de-watering pump and dewatering device to remove water left between the in-stream 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.

*NOTE: All Joints From Sta 0+00 to Sta 8+00 ARE ALL Restrained Joints With Loc Gaskets

The Virginia Stream Restoration & Stabilization Best Management Practices Guide DETAIL 5.1: PUMP-AROUND PRACTICE

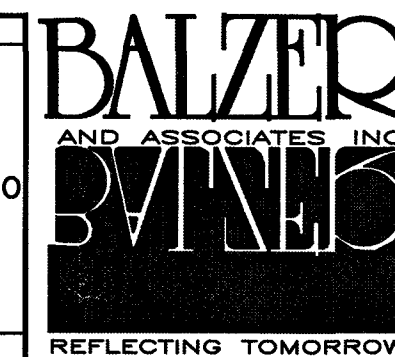


TEMPORARY CULVERT CROSSING (SC)



Source: Va. DSWC

Plate 3.24-2



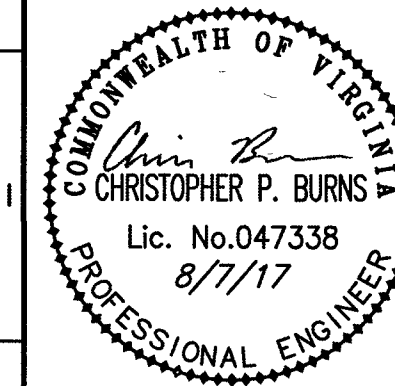
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Balzer and Associates, Inc.

1208 Corporate Circle
Roanoke, VA 24018
540-772-9580
FAX 540-772-8050



FOX HUNT SUBDIVISION
5661 ROSELAWN ROAD
OFF-SITE WATERLINE EXTENSION 1
WINDSOR HILLS DISTRICT
ROANOKE COUNTY, VIRGINIA

DRAWN BY CPB
DESIGNED BY CPB
CHECKED BY BTC
DATE 10/1/2015
SCALE 1"=40'

REVISIONS:
1/7/2016
3/7/2016
4/26/2016
5/17/2017
7/20/2017
8/7/2017

SHEET NO.

C5

JOB NO. 04150025.00