

1. THE EROSION CONTROL NARRATIVE BY ENGINEERING CONCEPTS, INC. SHALL BE ADHERED TO AS A PART OF THE CONTRACT. ALL NEW EROSION CONTROL DEVICES SHALL BE INSTALLED PER THE NARRATIVE AND PLAN AND ARE IN ADDITION TO THE EXISTING EROSION CONTROL MEASURES APPROVED WITH THE MASS GRADING PHASE OF THIS PROJECT.

- ### EROSION CONTROL PHASING NOTES

1. INSTALL INLET AND OUTLET PROTECTION AS THE STORM SYSTEM IS INSTALLED.
2. INSTALL AGGREGATE BASE COURSE AS IDENTIFIED IN THE PERMANENT PAVEMENT SECTION FOR CONSTRUCTION ROAD STABILIZATION.
3. CONTRACTOR SHALL REMOVE EROSION CONTROL MEASURES ONLY AFTER DISTURBED AREAS ARE STABILIZED AND APPROVAL HAS BEEN OBTAINED FROM THE CITY OF ROANOKE AND ROANOKE COUNTY INSPECTORS.

FOR INSTALLED EROSION CONTROL MEASURES SEE THE MASS GRADING EROSION CONTROL NARRATIVE  
EROSION AND SEDIMENT CONTROL NARRATIVE

## PROJECT DESCRIPTION

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The purpose of this project is to develop a new eight lot subdivision with associated infrastructure. The future uses are restaurants, retail, hotel, daycare, and offices. The total disturbed area will be 60 Acres in Roanoke County and 8.20 Acres in Roanoke City. Utilities are planned for this development. The amount of disturbance to the ground surface will not be confined to within the site additional grading in the rights-of-way will be required. Cut material will be hauled from this site to reach finished grade. The contractor shall provide a separate erosion and sediment control plan for offsite borrow area prior to permit issuance.

## EXISTING SITE CONDITIONS

The upper development area slopes to the existing detention facility on the Orvis property. The remainder of the site slopes to the south and southeast. The site has well established grass with trees along the northeast property line. An existing gravel area is located on the county portion of the property along with a shed.

ADJACENT PROPERTY

Properties Northeast of the site are zoned R1 & C1. The property to the Northwest is zoned CG. U.S. Route 460 is located to the east and Blue Hills Drive is located to the south of the site.

### OFF-SITE DRAINAGE

This site will receive runoff from an area located in the northeast portion of the site. This runoff will enter the proposed onsite storm drain system and outfall into the pond located in the county portion of the site.

## SOILS

The proposed site is underlain by the Rome Formation of the Cambrian Age. It consists of shale, limestone and dolomite. The onsite soils have a low shrink swell potential. The soil on-site with more shale material is readily compacted. The soils on-site with more clay material may require drying before compaction.

### CRITICAL EROSION AREAS

Critical erosion areas include any disturbed 3:1 slopes and ditch linings. All slopes, 3:1 OR steeper, will receive turf reinforcement matting. Ditch linings will receive turf reinforcement matting and vegetation.

## EROSION AND SEDIMENT CONTROL MEASURES

EROSION AND SEDIMENT CONTROL MEASURES  
Unless otherwise indicated, all vegetative and structural erosion and sediment control practices shall be constructed and maintained according to minimum standards and specifications of the 1992 Virginia Erosion and Sediment Control Handbook. The minimum standards of the Virginia Erosion and Sediment Control Regulations shall be adhered to unless otherwise waived or approved by a variance.

## STRUCTURAL PRACTICES

1. CRS-CONSTRUCTION ROAD STABILIZATION-3.03  
Temporary stabilize access road with stone immediately after grading. The design aggregate base section shown on the pavement section detail on sheet 8 of the plan set will act as the CRS.
2. IP-STORM DRAIN INLET PROTECTION-3.07  
All storm sewer drain inlets shall be protected as shown during construction.
3. CIP-CULVERT INLET PROTECTION-3.08  
A sediment filter to prevent sediment from entering the existing culverts.
4. OP-OUTLET PROTECTION-3.18  
A stone line apron will be placed at the outlet of the pipe at the ponds and at the outlet of the pipe at the temporary sediment basin to prevent scour.

VEGETATIVE PRACTICES  
SEE APPROVED MASS GRADING PLANS

## MAINTENANCE

MAINTENANCE

In general, all erosion and sediment control measures will be checked daily and after each significant rainfall. The following items will be checked in particular:

1. The gravel outlets will be checked regularly for sediment buildup that may prevent drainage. If the gravel is clogged by sediment, it shall be removed and cleaned, or replaced.

## PERMANENT STABILIZATION

PERMANENT SEEDING shall be stabilized with permanent seeding within 7 days of reaching final grade. All areas disturbed by construction shall be stabilized with permanent seeding according to Std. on Spec. 3.32, PERMANENT SEEDING, of the 1992 Virginia Erosion and Sediment Control Handbook. Mulch (straw or fiber) will be used on all seeded areas. In all seeding operations, seed, fertilizer and lime will be applied prior to mulching. Erosion control blankets may be installed over fill slopes, which have been brought to final grade and have been seeded to protect the slopes properly.

## STORM WATER MANAGEMENT

The flow generated on site will travel through the proposed stormwater pipe system to City Pond #1. The outfall pipe from the pond #1 will connect to an existing storm drain offsite. Flow generated on site will travel through the proposed pipe system to County Pond #2. The outfall pipe from the pond #2 will outfall into a ditch adjacent to U.S. Route 460.

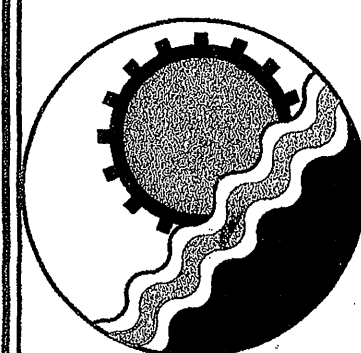
THIS SHEET IS FOR  
EROSION & SEDIMENT CONTROL ONLY.

SEE ATTACHED MASS GRADING SHEETS 7  
AND 8 FOR EROSION AND SILTATION  
MEASURES APPROVED WITH THE MASS  
GRADING REVIEW.

#### 4VAC50-30-40 Minimum Standards.

An erosion and sediment control program adopted by a district or locality must be consistent with the following criteria, techniques and methods:

- Permanent or temporary soil stabilization shall be applied to denuded areas within seven days after final grade is reached on any portion of the site. Temporary soil stabilization shall be applied within seven days after final grade is reached on any portion of the site. That grade but will remain denuded for longer than 30 days. Permanent stabilization of all soil exposed to erosion shall be installed within six months after final grade is reached. Temporary stabilization shall be applied to areas that are to be left denuded for more than one year. **AS SHOWN ON THE APPROVED MAAS GRADING PLANS.**
- During construction of the project, soil stockpiles and borrow areas shall be stabilized or protected with sediment trapping measures. The applicant is responsible for the temporary protection and permanent stabilization of all soil exposed to erosion, as well as any soil areas and soil intentionally transported from the project site. **AS SHOWN ON THE APPROVED MAAS GRADING PLANS.**
- A permanent vegetative cover shall be established on denuded areas not otherwise permanently stabilized. Permanent vegetation shall not be considered established until a ground cover is achieved that is uniform, mature enough to survive and will inhibit erosion. **AS SHOWN ON THE APPROVED MAAS GRADING PLANS.**
- Sediment basins and traps, perimeter ditches, sediment barriers and other measures intended to trap sediment shall be installed as a first step prior to any final grading activity and shall be maintained before upslope land disturbance takes place. **AS SHOWN ON THE APPROVED MAAS GRADING PLANS.**
- Stabilization measures shall be applied to earthen structures such as dikes, ditches and diversions immediately after installation. **AS SHOWN ON THE APPROVED MAAS GRADING PLANS.**
- Sediment traps and sediment basins shall be designed and constructed based upon the total drainage area to be served by the trap or basin. **AS SHOWN ON THE APPROVED MAAS GRADING PLANS.**
- a. The minimum storage capacity of a sediment trap shall be 134 cubic yards per acre of drainage area and the trap shall only control drainage areas less than three acres.
- b. Surface runoff from disturbed areas that is comprised of flow from drainage areas greater than or equal to three acres shall be controlled by a sediment basin. The minimum storage capacity of a sediment basin shall be 134 cubic yards per acre of drainage area. Sediment basins shall be designed to maintain the structural integrity of the basin during a two-year five day storm of 24-hour duration. Runoff calculations used in runoff calculations shall correspond to a bare earth condition or those conditions expected to exist while the sediment basin is utilized.
- c. Cut and fill slopes shall be designed and constructed in a manner that will minimize erosion. Slopes that are found to be eroding significantly will be regraded to the original surface and will be protected with additional slope stabilizing measures until the problem is corrected. **MAXIMUM SLOPE FOR THIS PROJECT IS 2 TO 1.**
- d. Concentrated runoff shall not flow down cut or fill slopes unless contained within an adequate temporary or permanent channel, flume or slope drain structure. **AS SHOWN ON THE APPROVED MAAS GRADING PLANS.**
- e. Whenever water seeps from a slope face, adequate drainages or other protection shall be provided. **IF ENCOUNTERED DURING CONSTRUCTION THEN APPROPRIATE MEASURE WILL BE PROVIDED.**
- f. All storm sewer inlets that are made operable during construction shall be protected so that sediment laden water cannot enter the conveyance system without first being filtered or otherwise treated to remove sediment. **AS SHOWN ON PLANS.**
- g. Before newly constructed stormwater conveyance channels or pipes are made operational, adequate outlet protection and any required temporary or permanent channel shall be installed by both the conveyance channel and receiving channel. **AS SHOWN ON PLANS**
- h. When work in a watercourse is performed, precautions shall be taken to minimize encroachment, control sediment transport, stabilize the banks and prevent sediment input possible during construction. Nonerodible material shall be used for the construction of causeways and groynes. Earthen fill may be used for these structures if eroded by nonerodible cover materials. **NOT APPLICABLE.**
- i. When a live watercourse must be crossed by construction vehicles more than twice in any six-month period, a temporary vehicular stream crossing constructed of nonerodible material shall be provided. **NOT APPLICABLE.**
- j. All applicable federal, state and local regulations pertaining to working in or crossing live watercourses shall be met. **NOT APPLICABLE.**
- k. The bed and banks of a watercourse shall be stabilized immediately after work in the watercourse is completed. **NOT APPLICABLE.**
- Underground utility lines shall be installed in accordance with the following standards in addition to other applicable criteria. **AS SHOWN ON PLANS.**
- a. No more than 500 linear feet of trench may be opened at one time.
- b. Excavated material shall be placed on the uphill side of trenches.
- c. Effluent from dewatering operations shall be filtered or passed through an approved sediment trapping device, or both, and discharged in a manner that does not adversely affect flowing streams or off-site property.
- d. Material used for backfilling trenches shall be properly compacted in order to minimize erosion and promote stabilization.
- e. Restoration shall be accomplished in accordance with these regulations.
- f. Applicable state regulations shall be complied with.
- Where construction vehicle access routes intersect private or public roads, provisions shall be made to minimize the transport of sediment and debris onto the roadway surface. When sediment is transported onto a paved or unpaved public road surface, the road surface shall be cleaned thoroughly at the end of each day. Sediment shall be removed from the roads by sweeping or other means that is sufficient to a sediment control disposal area. Street sweeping shall be allowed after each sediment is removed from the roadway. This provision shall apply to individual development lots as well as to all larger land-clearing activities. **PREVENT DEBRIS FROM ENTERING BLUE HILLS DRIVE.**
- All temporary erosion and sediment control measures shall be removed within 30 days after final site stabilization or after the temporary measures are no longer needed, unless otherwise authorized by the local program authority. Trapped sediment and the disturbed soil areas resulting from the disruption of temporary measures shall be permanently stabilized to prevent further erosion and sedimentation. **CONTACT ROCKWOLD COUNTY AND ROCKWOLD CITY PRIOR TO REMOVING MEASURES.**
- Properties and waterways downstream from development sites that be protected from sediment deposition, erosion and damage due to increases in volume, velocity and peak flow rate of stormwater runoff for the stated frequency of a given storm duration in accordance with the following standards and criteria. **FINAL DESIGN SHOWS POND 4 OUTFALLING INTO AN EXISTING STORM DRAIN SYSTEM AND POND 2 INTO AN EXISTING DITCH ALONG ROUTE 460.**
- a. Concentrated stormwater runoff leaving a development site shall be discharged directly into an adequate natural or man-made receiving channel, pipe or storm sewer system. For those sites where runoff is discharged into a pipe or pipe system, downstream stability analyses at the outlet of the pipe or pipe system shall be performed.
- b. Adequacy of all channels and pipes shall be verified in the following manner:
- (1) The applicant shall demonstrate that the total drainage area to the point of analysis within the channel is one hundred times greater than the contributing drainage area of the project in question; or
- (2) a. Natural channels shall be analyzed by the use of a two-year storm to verify that stormwater will not overtop channel banks nor cause erosion of channel bed or banks; and
- b. All previously constructed man-made channels shall be analyzed by the use of a ten-year storm to verify that stormwater will not overtop the banks and by the use of a two-year storm to demonstrate that stormwater will not cause erosion of channel bed or banks; and
- (3) Pipes and storm sewer systems shall be analyzed by the use of a ten-year storm to verify that stormwater will be contained within the pipe or system.
- c. If existing natural receiving channels or previously constructed man-made channels are not adequate, the applicant shall:
- (1) Improve the channel to a condition where a ten-year storm will not overtop the banks and a two-year storm will not cause erosion of the channel bed or banks; or
- (2) Improve the pipe or pipe system to a condition where the ten-year storm is contained within the appurtenances; or
- (3) Develop a site design that will not cause the pre-development peak runoff rate from a two-year storm to increase when runoff outlets into a natural channel or will not cause the pre-development peak runoff rate from a ten-year storm to increase when runoff outlets into a man-made channel; or
- (4) Provide a combination of channel improvement, stormwater detention or other measures which is satisfactory to the plan-approving authority to prevent downstream channel erosion.
- d. The applicant shall provide evidence of permission to make the improvements.
- e. All hydrologic analyses shall be based on the existing watershed characteristics and the ultimate development of the subject project.
- f. If the applicant chooses an option that includes stormwater detention he shall obtain approval from the locality of a plan for maintenance of the detention facilities. The plan shall set forth the maintenance requirements of the facility and the person responsible for performing the maintenance.
- g. Outfall from a detention facility shall be discharged to a receiving channel, and energy dissipaters shall be placed at the outfall of all detention facilities as necessary to provide a stabilizing transition from the facility to the receiving channel.
- h. All on-site channels must be verified to be adequate.
- i. Increased volumes of sheet flows that may cause erosion or sedimentation on adjacent property shall be diverted to a stable outlet, adequate channel, pipe or pipe system, or to a detention facility.
- j. In applying these stormwater runoff criteria, individual lots or parcels in a residential, commercial or industrial development shall not be considered to be separately developed projects. Instead, the development, as a whole, shall be considered to be a single development project. Hydrologic parameters that reflect the ultimate development condition shall be used in all engineering calculations for the design of pipes, ditches and other outlets of the site.
- k. All measures used to protect properties and waterways shall be employed in a manner which minimizes impacts on the shore, channel and riparian habitat, and the ecology of the river, stream and other outlets of the site.



# ENGINEERING CONCEPTS, INC.

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U.S. ROUTE 460 R/W VARIES

U.S. ROUTE 460

No.	Revision	By	Appd	Date	Drawn	DRB
△	CITY, COUNTY & VDOT NOV. COMMENTS	DRB	JDE	03/22/07	Designed	JDE/JSN
△	CITY, COUNTY & VDOT APRIL COMMENTS	DRB	JDE	05/24/07	Checked	JDE
△	CITY COMMENTS, 6/18/07	DRB	JDE	06/18/07	Approved	JDE
△	CITY COMMENTS, 7/9/07	DRB	JDE	07/12/07		

BLUE HILLS VILLAGE EROSION CONTROL PLAN
BLUE HILLS DRIVE & U.S. ROUTE 460 ROANOKE, VIRGINIA

SCALE: 1"=60'  
OCT. 20, 2006  
PROJECT: 06067  
14