PROJECT DESCRIPTION:
The purpose of this project is to clear and grade the site as shown on the attached plans and the construction of a 175–lot cluster home development. The project will be constructed in phases; these plans have been designed to show all E&SC measures necessary for construction of Phase I. Two points of access to the development will be constructed. The main entrance will be located along Plantation Road across from Petty Avenue (approx. 1/2 mile north of Hershberger Road). The main entrance will provide access to the entire development, except the lots located on Private Street 'C'. The second point of entry to the site will be from Plantation Circle. This second point of access will serve only Lots 101–120.

EXISTING SITE CONDITIONS:
The subject site is currently a large, steeply sloping hay field with medium to high–density vegetation. Along the East side of the site Tinker Creek flows form north to south.

OFF–SITE AREAS:
This development will require some roadway improvements to take place along Plantation Road. The improvements in Plantation Road will require a turn lane and taper and acceleration lane at the main entrance to the development. Plantation Road will be widened to accommodate the increased traffic generated by the site. Plans for these improvements are included in this package and are currently being reviewed by VDOT.

ADJACENT AREAS:
To the north of the proposed development lies a cemetery. Across Plantation Road to the west of the proposed development is a residential district (zoned R–1). To the east of the development is Tinker Creek flowing from north to south. Tinker Creek separates the site from several 1–2 acre residences. At the southeast corner of the site is a piece of property owned by someone. These plans show a dedicated right of way to this land. Directly south of the site is another residential development. Plantation Circle divides the residences from the development.

SOILS:
A subsurface investigation has not been prepared for this site. The soils map for this area shows generally blank type of soil with a high possibility of sinkholes and "Karst" topography.

CRITICAL AREAS:
There are several critical areas located on the site. Two temporary sediment basins will be constructed as shown on the plans. One of these sediment basins will be converted to a permanent detention facilities/wet pond once the grading operations have been completed and the disturbed areas have been stabilized. Sediment traps will also be located at strategic locations throughout the site to trap sediment–laden runoff. Diversion dikes will be constructed to direct runoff into the sediment basins and traps. Silt fence will be installed at the lower reaches of the project to prevent sediment from making its way into Tinker Creek.

EROSION & SEDIMENT CONTROL MEASURES:
Unless otherwise indicated, all vegetative and structural erosion and sediment control practices shall be constructed and maintained to the minimum standards and specifications of the "Virginia Erosion and Sediment Control Handbook", Third Edition:

1. The construction entrance to the development will be adjacent to the existing gravel road located at the bend in Plantation Circle until the main entrance has been graded and stabilized. The entrance shall be constructed in conformance with Std. & Spec 3.02. A wash rack shall be provided and maintained throughout the duration of the project.
2. Silt fence shall be installed in conformance with Std. & Spec 3.05 around the limits of construction on the site as shown on the erosion & sediment control plan.
3. Sediment traps & basins shall be constructed at the locations shown on the plans and the contractor shall divert runoff to them by creating diversion dikes and/or ditches; whichever the topography warrants.
4. Prior to the start of construction, the contractor shall install erosion and sediment control devices as shown on the plans.
This work shall be coordinated in order of the work, which is to follow: control at centers of flow, and other points of concentration shown shall be constructed in place first.

EROSION & SEDIMENT CONTROL CONSTRUCTION SEQUENCE:
General: this E&SC work sequence has been developed to minimize the potential for sedimentation of adjoining streams and waterways during the construction of this project and to assist the contractor in complying with local and state erosion and sediment control laws. This sequence does not contain every step necessary to ensure compliance. The contractor shall take additional step, depending on construction methods and means employed, to ensure compliance with said E&SC laws.

1. Obtain / pick–up grading permit from Roanoke county.
2. Call for E&SC pre–construction conference with Roanoke county inspection staff.

Phase I:
3. Construct construction entrance (CE).
4. Begin construction on temporary sediment basin (TSB) #1 outfall pipe. Clear and grub only as required for construction of outfall. Provide inlet protection as line is being constructed. Place fill as needed to build the outfall line. Control sediment runoff using sift fence (SF). Construct outlet structure and sediment riser.
5. Place silt fence (SF) at locations shown on plans. Clear and grub area of embankment and TSB#1, begin placement of fill in embankment and bottom of TSB #1. As grade reaches the 1060 elevation, divert flow into the sediment riser. Continue filling operations until TSB#1 is fully developed.
6. Construct temporary sediment traps (TST) as shown on the plan and as specified on sheet C–24. Construct DD and SF at each TST as shown hereon.
7. Seed down slope areas of DD and TST using temporary seed mixture.
8. Call for inspection of measure. Add measures or modify constructed measures as required to ensure acceptance / approval by Roanoke county inspection staff.
9. Begin clearing and grubbing of phase I area. Stage work to ensure that maximum drainage area for any TST is not exceeded.

Phase II: (And each subsequent Phase)
10. A separate Erosion and Sediment Control Plan shall be submitted to, and approved by, Roanoke County prior to development of future phases.

PERMANENT STABILIZATION:
After the installed control devices are found to be functional, the contractor shall immediately proceed with clearing, grubbing, and preliminary grading operations. All exposed denuded areas shall be seeded within seven days after final grade has been obtained, and shall be accomplished in strict accordance with the "Virginia Erosion and Sediment Control Handbook", Third Edition
Following the completion of development and stabilization of all areas, and after it has been determined that erosion or sedimentation is no longer occurring on the site or at its boundaries, and drainage flows are functioning according to design, the contractor may then begin to remove the temporary erosion and sediment control devices. This work shall be done in a careful, neat, and organized manner.

MAINTENANCE REQUIREMENTS:
STD & SPEC 3.02 – TEMPORARY STONE CONSTRUCTION ENTRANCE
The entrance shall be maintained in a condition which will prevent tracking or flow of mud onto public right–of–way. This will require periodic top dressing with additional stone or the washing and reworking of existing stone as conditions demand and repair and/or cleanout of any structures used to trap sediment. All materials spilled, dropped, washed, or tracked from vehicles onto roadways or into storm drains must be removed immediately. The use of water trucks to remove materials dropped, washed, or tracked onto roadways will not be permitted under any circumstances.
STD & SPEC 3.05 – SILT FENCE
1. Silt fences shall be inspected immediately after each rainfall and at least daily during prolonged rainfall. Any required repairs shall be made immediately.
2. Close attention shall be paid to the repair of damaged silt fence resulting from end runs and undercutting.
3. Should the fabric on a silt fence decompose or become ineffective prior to the end of the expected usable life and the barrier still be necessary, the fabric shall be replaced promptly.
4. Sediment deposits should be removed after each storm event. They must be removed when deposits reach approximately one–half the height of the barrier.
5. Any sediment deposits remaining in place after the silt fence is no longer required shall be dressed to conform with the existing grade, prepared and seeded.
STD & SPEC 3.07 – STORM DRAIN INLET PROTECTION
1. The structure shall be inspected after each rain 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.
STD & SPEC 3.09 – TEMPORARY DIVERSION DIKE
The measure shall be inspected after every storm and repairs made to the dike, flow channel, outlet or sediment trapping facility, as necessary. Once every two weeks, whether a storm event has occurred or not, the measure shall be inspected and repairs made if needed. Damages caused by construction traffic or other activity must be repaired before the end of each working day.
STD & SPEC 3.13 – TEMPORARY SEDIMENT TRAP
1. Sediment shall be removed and the trap restored to its original dimensions when the sediment has accumulated to one half the design volume of the wet storage. Sediment removal from the basin shall be deposited in a suitable area and in such a manner that it will not erode and cause sedimentation problems.
2. Filter stone shall be regularly checked to ensure that filtration performance is maintained. Stone choked with sediment shall be removed and cleaned or replaced
3. The structure should be checked regularly to ensure that it is structurally sound and has not been damaged by erosion or construction equipment. The height of the stone outlet should be checked to ensure that its enter is at least 1 foot below the top of the embankment.

4VAC50–30–40 Minimum Standards
1. 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 to denuded areas that may not be at final grade but will remain dormant for longer than 30 days. Permanent stabilization shall be applied to areas that are to be left dormant for more than one year. REFER TO PS/TS SHOWN ON SHEET C–11 AND SEE NOTE 3 ON SHEET C–11.

2. 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 stockpiles on site as well as borrow areas and soil intentionally transported from the project site. NO TEMPORARY STOCKPILES ARE ANTICIPATED.

3. 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. REFER TO PS/TS SHOWN ON SHEET C–11 AND SEE NOTE 3 ON SHEET C–11,

4. Sediment basins and traps, perimeter dikes, sediment barriers and other measures intended to trap sediment shall be constructed as a first step in any land–disturbing activity and shall be made functional before upslope land disturbance takes place. REQUIRED AND SPECIFIED SEDIMENT TRAPS AND BASINS ARE SHOWN ON SHEET C–11. SEQUENCE OF WORK SHOWN HEREON.

5. Stabilization measures shall be applied to earthen structures such as dams, dikes and diversions immediately after installation. REFER TO NARRATIVE / SEQUENCE OF WORK.

6. Sediment traps and sediment basins shall be designed and constructed based upon the total drainage area to be served by the trap or basin. SEDIMENT TRAPS AND BASIN ARE SIZED AS REQUIRED.
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. The outfall system shall, at a minimum, maintain the structural integrity of the basin during a twenty–five year storm of 24–hour duration. Runoff coefficients used in runoff calculations shall correspond to a bare earth condition or those conditions expected to exist while the sediment basin is utilized.

7. Cut and fill slopes shall be designed and constructed in a manner that will minimize erosion. Slopes that are found to be eroding excessively within one year of permanent stabilization shall be provided with additional slope stabilizing measures until the problem is corrected. REFER TO MEASURES AND REQUIREMENTS STIPULATED ON SHEET C–11.

8. Concentrated runoff shall not flow down cut or fill slopes unless contained within an adequate temporary or permanent channel, flume or slope drain structure. N/A – STORM DRAIN SYSTEM OUTFALLS INTO AN EXISTING SYSTEM.

9. Whenever water seeps from a slope face, adequate drainage or other protection shall be provided. IF ENCOUNTERED DURING CONSTRUCTION TO BE ADDRESSED WITH PLAN REVISION.

10. 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. REFER TO IP AS SHOWN ON SHEET C–11.

11. Before newly constructed stormwater conveyance channels or pipes are made operational, adequate outlet protection and any required temporary or permanent channel lining shall be installed in both the conveyance channel and receiving channel. N/A – SYSTEM OUTFALLS INTO AN EXISTING COLLECTION / CONVEYANCE SYSTEM.

12. When work in a live watercourse is performed, precautions shall be taken to minimize encroachment, control sediment transport and stabilize the work area to the greatest extent possible during construction. Nonerodible material shall be used for the construction of causeways and cofferdams. Earthen fill may be used for these structures if armored by nonerodible cover materials. NOT APPLICABLE.

13. 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

14. All applicable federal, state and local regulations pertaining to working in or crossing live watercourses shall be met. NOT APPLICABLE

15. The bed and banks of a watercourse shall be stabilized immediately after work in the watercourse is completed. NOT APPLICABLE

16. Underground utility lines shall be installed in accordance with the following standards in addition to other applicable criteria:
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. Restabilization shall be accomplished in accordance with these regulations.
f. Applicable safety regulations shall be complied with.
REFER TO NARRATIVE AND WORK SEQUENCE.

17. Where construction vehicle access routes intersect paved or public roads, provisions shall be made to minimize the transport of sediment by vehicular tracking onto the paved surface. Where sediment is transported onto a paved or public road surface, the road surface shall be cleaned thoroughly at the end of each day. Sediment shall be removed from the roads by shoveling or sweeping and transported to a sediment control disposal area. Street washing shall be allowed only after sediment is removed in this manner. This provision shall apply to individual development lots as well as to larger land–disturbing activities. REFER TO SHEET C–11 FOR LOCATION OF CE.

18. 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 disposition of temporary measures shall be permanently stabilized to prevent further erosion and sedimentation. REFER TO NARRATIVE AND WORK SEQUENCE.

19. Properties and waterways downstream from development sites shall 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 storm of 24–hour duration in accordance with the following standards and criteria:
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 outfall 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; andst
(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 its banks and by the use of a two–year storm to demonstrate that stormwater will not cause erosion of channel bed or banks; and
(c) 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 or pipes 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 to 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 outfalls into a natural channel or will not cause the pre–development peak runoff rate from a ten–year storm to increase when runoff outfalls 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 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 dissipators shall be placed at the outfall of all detention facilities as necessary to provide a stabilized 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 separate development 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.
k. All measures used to protect properties and waterways shall be employed in a manner which minimizes impacts on the physical, chemical and biological integrity of rivers, streams and other waters of the state.
STORMWATER DETENTION PROVIDED AT DETENTION BASIN TO ADDRESS THIS REQUIREMENT.

COMMONWEALTH OF VIRGINIA
WM. THOMAS AUSTIN
No. 039907
PROFESSIONAL ENGINEER

Revisions	Date
1 PHASE I REVISIONS	11/10/06

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THE VILLAGE AT TINKER CREEK – PHASE I
EROSION & SEDIMENT CONTROL NARRATIVE
ROANOKE COUNTY, VIRGINIA

Vertical Scale: N/A
Horizontal Scale: 1"=100'
Commission Number: 1966–AS
Sheet No.: C–11A