

ENGINEERS NOTES

SPECTRUM DESIGN, PC ASSUMES NO RESPONSIBILITY FOR INFORMATION ON OR ADEQUACY OF THE PLANS UNTIL THEY HAVE BEEN APPROVED BY REQUIRED PUBLIC AUTHORITIES.

COMMENCEMENT OF ANY WORK ON THE PROJECT IS AT THE SOLE RISK OF THE OWNER/DEVELOPER.

GENERAL NOTES

STANDARDS: ALL MATERIALS AND METHODS SHALL COMPLY WITH THE APPLICABLE STANDARDS OF THE AMERICAN SOCIETY OF TESTING AND MATERIALS (ASTM), AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI), VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT), VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (ESC HANDBOOK), COMMONWEALTH OF VIRGINIA DEPARTMENT OF HEALTH (VDH) AND/OR THE CITY OF ROANOKE, LATEST EDITIONS. RECOMMENDATIONS OF APPLICABLE MATERIALS MANUFACTURERS SHALL ALSO BE FOLLOWED AS PART OF THIS CONTRACT.

DEBRIS: CONSTRUCTION DEBRIS SHALL BE CONTAINERIZED IN ACCORDANCE WITH THE VIRGINIA LITTER CONTROL ACT. NO LESS THAN ONE LITTER RECEPTACLE SHALL BE PROVIDED ON SITE. ALL DAMAGED MATERIAL OR SURPLUS EXCAVATED MATERIAL NOT SUITABLE FOR USE AS FILL, BACKFILL OR TOPSOIL SHALL BECOME THE PROPERTY OF THE CONTRACTOR TO DISPOSE OF OFFSITE AS HE WISHES, WITHOUT INJURY TO THE OWNER OR ANY INDIVIDUAL.

ALL WORK WITHIN PUBLIC R/W SHALL ADHERE TO THE CITY OF ROANOKE EXCAVATION AND RESTORATION STANDARDS. COPIES OF THESE STANDARDS ARE AVAILABLE AT THE CITY OR ONLINE IN *PDF FORMAT AT WWW.ROANOKEVA.GOV.

- SPECIFIC AREAS TO ADDRESS INCLUDE:
- A. WIDTHS AND DEPTHS OF PAVEMENT RESTORATION INCLUDING EITHER REPLACEMENT OR MILL AND OVERLAY.
 - B. PAVEMENT MARKING REPLACEMENT OR ADDITIONS WHERE DISTURBED OR RELOCATED.
 - C. SIGNALIZED INTERSECTIONS: AFTER LOOP DETECTOR LOCATION BY MISS UTILITY, ALL LOOPS DISTURBED SHALL BE REPLACED OR REPAIRED WITHIN THREE BUSINESS DAYS.
 - D. FORMS: PERMIT APPLICATION, PERMIT BOND, AND WORK LOCATION SHEET.

OBTAIN AND PAY FOR ALL REQUIRED PERMITS AND FEES TO PERFORM WORK WITHIN ALLEY AND PUBLIC RIGHT-OF-WAY.

OBTAIN AND PAY FOR ALL STREET OPENING PERMITS REQUIRED BY THE CITY FOR UTILITY OR RETAINING WALL INSTALLATIONS.

REFER TO ARCHITECTURAL DRAWINGS FOR CONCRETE SCORING PATTERNS.

CONTRACTOR TO SUPPLY CITY WITH TRAFFIC CONTROL PLAN PRIOR TO ANY WORK WITHIN THE RIGHT OF WAY OF HENRY STREET, NW OR CENTRE AVENUE, NW.

UTILITIES SHOWN WERE OBTAINED FROM BEST AVAILABLE SOURCES. CONTRACTOR SHALL ASSUME MINOR DISCREPANCIES AND ASSUME COSTS ASSOCIATED TO CONNECT OR PROVIDE MINOR ADJUSTMENTS.

THE PROPERTY TO BE RE-DEVELOPED AND ALL ADJACENT PROPERTIES ARE ZONED AS D: DOWNTOWN.

GRADING & TRENCHING NOTES

CLEAR, GRUB & STRIP: ALL VEGETATION AND OVERBURDEN INCLUDING TOPSOIL, ORGANIC MATERIAL AND ANY UNSATISFACTORY SOIL MATERIALS, SHALL BE REMOVED TO THE EXTENT OF GRADING INDICATED ON THE GRADING PLAN.

BACKFILL: MATERIAL, COMPACTION AND METHODS PER VDOT REQUIREMENTS.

COMPACTION: FILL MATERIAL SHALL BE PLACED IN LIFTS NOT EXCEEDING SIX (6) INCHES AND COMPACTED TO NINETY-FIVE (95) PERCENT OF ITS MAXIMUM DENSITY AS DETERMINED IN ACCORDANCE WITH ASTM D698 (STANDARD PROCTOR). SEPARATE PROCTORS SHALL BE RUN FOR EACH SOIL TYPE BEING USED. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO INFORM THE TESTING AGENCY OF SOURCES OF FILL OR BACKFILL MATERIAL OTHER THAN THAT OBTAINED ON-SITE.

RIGHT-OF-WAY: ALL TRENCHING, BACKFILLING AND PATCHING WITHIN PUBLIC RIGHT-OF-WAY SHALL CONFORM TO THE CITY OF ROANOKE AND WWMA STANDARDS AND REQUIREMENTS INCLUDING TESTING AND INSPECTION PROCEDURES.

PAVEMENT NOTES

STANDARDS: ALL CONSTRUCTION METHODS AND MATERIALS SHALL BE IN ACCORDANCE WITH THE VDOT "ROAD & BRIDGE STANDARDS & SPECIFICATIONS," LATEST EDITION AND THE LATEST REQUIREMENTS OF THE CITY OF ROANOKE.

UTILITIES: ALL UTILITIES SHALL BE IN PLACE PRIOR TO LAYING THE BASE MATERIAL.

DRAINAGE NOTES

NATURAL DRAINAGE: THE CONTRACTOR SHALL MAKE PROVISIONS AT ALL TIMES TO ALLOW NATURAL DRAINAGE TO FLOW THROUGH THE WORK AREA WITH MINIMUM DAMAGE TO THE NEW CONSTRUCTION AND NO DAMAGE TO ADJACENT PROPERTY OR THE EXISTING DOWNSTREAM STORM DRAINAGE SYSTEM, WHETHER NATURAL OR MAN-MADE.

MATERIALS: RAIN WATER COLLECTION PIPE AND FITTINGS SHALL BE POLYVINYL-CHLORIDE PIPE (PVC) INSTALLED PER MANUFACTURER'S INSTRUCTIONS AND CONFORMING TO ASTM F-405 AND VDOT SECTION 240. ALL VISIBLE OUTLETS SHALL BE CAST IRON AS APPROVED BY THE ARCHITECT.

FLOOD: THE SUBJECT PROPERTY IS NOT WITHIN THE LIMITS OF THE FEMA 100 YEAR FLOOD BOUNDARY.

RECONDITIONING EXISTING SURFACES TO REMAIN: RECONDITION EXISTING SURFACES DAMAGED BY CONTRACTOR'S OPERATIONS, INCLUDING STORAGE OF MATERIALS AND EQUIPMENT, AND MOVEMENT OF VEHICLES. ALSO RECONDITION EXISTING LANDSCAPED AREAS WHERE MINOR REGRADEING IS REQUIRED.

WATER NOTES

STANDARDS: CONSTRUCTION OF ALL WATER LINES, STRUCTURES, AND PAVEMENT REPLACEMENT SHALL CONFORM TO THE REQUIREMENTS OF THE VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT) "ROAD AND BRIDGE STANDARDS AND SPECIFICATIONS" AND THE COMMONWEALTH OF VIRGINIA/STATE BOARD OF HEALTH (VDH) "WATER WORKS REGULATIONS" LATEST EDITIONS, AS MINIMUM STANDARDS, AS WELL AS THOSE OF THE WESTERN VIRGINIA WATER AUTHORITY (WVWA). SEE DETAILS.

SURFACE & COVER: IN AREAS OF WATER LINE CONSTRUCTION, GRADES SHALL BE WITHIN SIX (6) INCHES OF FINISHED SUBGRADE PRIOR TO THE COMMENCEMENT OF THIS WORK. MINIMUM CLEAR COVER OVER ALL WATER PIPE SHALL BE THREE (3) FEET.

TAPS/CONNECTIONS: ALL CONNECTIONS TO EXISTING WATER MAINS AND METER BOXES SHALL BE DONE BY THE CONTRACTOR AND COORDINATED WITH WWMA.

SEPARATION: THE CONTRACTOR SHALL COMPLY WITH THE STATE WATER WORKS AND WWMA REGULATIONS PERTAINING TO SEPARATION OF WATER AND SANITARY SEWER.

MATERIALS AND BEDDING: WATER PIPE SHALL BE DUCTILE IRON WITH PUSH-ON JOINTS. DUCTILE IRON PIPE SHALL CONFORM TO AWWA C-151/ANSI 21.51 AND FITTINGS SHALL CONFORM TO AWWA C-110/ANSI 21.10. THE PIPE AND FITTINGS SHALL BE BITUMINOUS COATED AND CEMENT LINED IN ACCORDANCE WITH AWWA C-104/ANSI 21.50 AND SHALL BE CLASS 50, AS A MINIMUM, UNLESS SPECIFIED OR INDICATED OTHERWISE. BEDDING AND BACKFILLING SHALL BE PER VDOT STANDARDS AND SPEC.

SERVICE: WATER SERVICE PIPE SHALL BE TYPE K COPPER TUBING. ALL CONNECTIONS SHALL USE COMPRESSION FITTINGS. FITTINGS FOR SERVICE LINES SHALL MEET AWWA SPEC. C-800-05. TRANSITION TO CPVC INSIDE BUILDING.

FINISH GRADE: THE CONTRACTOR SHALL LOCATE AND UNCOVER ALL VALVE BOXES AFTER PAVEMENT/SURFACE TREATMENT OF PAVED AREAS AND ADJUST THE TOPS TO FINAL ROAD GRADES, IF NECESSARY.

SEWER NOTES

STANDARDS: CONSTRUCTION OF ALL SANITARY SEWER LINES, STRUCTURES, AND PAVEMENT REPLACEMENT SHALL CONFORM TO THE REQUIREMENTS OF THE VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT) "ROAD AND BRIDGE STANDARDS AND SPECIFICATIONS" AND THE COMMONWEALTH OF VIRGINIA/STATE BOARD OF HEALTH (VDH) "SEWAGE HANDLING AND DISPOSAL REGULATIONS" LATEST EDITIONS, AS MINIMUM STANDARDS, AS WELL AS THOSE OF THE WWMA. SEE DETAILS.

SURFACE & COVER: IN AREAS OF SEWER CONSTRUCTION, GRADES SHALL BE THREE (3) FEET OVER THE CROWN OF THE PIPE TO BE LAID OR WITHIN SIX (6) INCHES OF FINISHED SUBGRADE PRIOR TO THE COMMENCEMENT OF THIS WORK. MINIMUM CLEAR COVER OVER PROPOSED LINES SHALL BE THREE (3) FEET.

SEPARATION: THE CONTRACTOR SHALL COMPLY WITH THE STATE WATER WORKS REGULATIONS PERTAINING TO SEPARATION OF WATER AND SANITARY SEWER. WHEN THE SEWER CANNOT MAINTAIN TEN (10) FEET HORIZONTAL SEPARATION MEASURED EDGE TO EDGE OR EIGHTEEN (18) INCHES VERTICAL SEPARATION EDGE TO EDGE (BELOW WATERLINE), THE SEWER SHALL BE CONSTRUCTED OF AWWA APPROVED MECHANICAL JOINT WATER PIPE AND PRESSURE TESTED IN PLACE TO FIFTY (50) PSI WITHOUT LEAKAGE PRIOR TO BACKFILLING.

MATERIAL & BEDDING: PIPE AND FITTINGS SHALL BE POLYVINYL CHLORIDE (PVC) SDR-35 AND SHALL CONFORM TO ASTM D-3034. BEDDING SHALL BE PER VDOT STANDARD AND SPEC. (CLASS B MIN.). ALL TRENCHES SHALL BE COMPACTED ACCORDING TO VDOT STANDARDS.

TAPS: ALL CONNECTIONS TO EXISTING SANITARY SEWER MAINS SHALL BE MADE BY THE CONTRACTOR AND COORDINATED WITH THE WWMA.

MANHOLE CONNECTIONS: PIPE SHALL BE CONNECTED TO MANHOLES THROUGH PRECAST OPENINGS AND JOINED WITH EITHER A FLEXIBLE BOOT ADAPTER OR A PIPE SEAL GASKET. TRANSITIONS BETWEEN ALLOWABLE TYPES OF PIPE SHALL BE MADE WITH AN ADAPTER COUPLING APPROVED BY THE WWMA WITHIN THE RIGHT-OF-WAY.

FINISH GRADE: THE CONTRACTOR SHALL LOCATE AND UNCOVER ALL SEWER MANHOLES AFTER PAVEMENT/SURFACE TREATMENT OF PAVED AREAS AND ADJUST THE TOPS TO FINAL ROAD GRADES, IF NECESSARY.

GENERAL EROSION & SEDIMENT CONTROL NOTES

ES-1: Unless otherwise indicated, all vegetative and structural erosion and sediment control practices will be constructed and maintained according to minimum standards and specifications of the Virginia Erosion and Sediment Control Handbook and Virginia Regulations (4VAC26-50) Erosion and Sediment Control Regulations.

ES-3: All erosion and sediment control measures are to be placed prior to or as the first step in clearing.

ES-4: A copy of the approved erosion and sediment control plan shall be maintained on the site at all times.

ES-5: Prior to commencing land disturbing activities in areas other than indicated on these plans (including, but not limited to, off-site borrow or waste area), the contractor shall submit a supplementary erosion control plan to the owner for review and approval by the plan approving authority.

ES-6: The contractor is responsible for installation of any additional erosion control measures necessary to prevent erosion and sedimentation as determined by the plan approving authority.

ES-7: All disturbed areas are to drain to approved sediment control measures at all times during land disturbing activities and during site development until final stabilization is achieved.

ES-9: The contractor shall inspect all erosion control measures periodically and after each runoff-producing rainfall event. Any necessary repairs or cleanup to maintain the effectiveness of the erosion control devices shall be made immediately.

EROSION AND SEDIMENT CONTROL NARRATIVE

RESPONSIBLE LAND DISTURBER

Upon award of the Construction Contract, the Contractor shall have in his employ a Responsible Land Disturber, who is certified by the Department of Environmental Quality. The name of this person is to be designated in writing by the Contractor to the State and local ESC plan approving authorities, the A/E, and the Owner along with copies of their certification prior to any land disturbance. The Responsible Land Disturber for this project shall be in charge of and is responsible for carrying out the land-disturbing activities on this project. Should the certified Responsible Land Disturber change at any time during the life of this project then the Land Disturbing Permit will become void and a new Permit must be obtained. Hereinafter RLD shall be interpreted as the Responsible Land Disturber. Relative to this plan, narrative, and the issued land disturbance permit the RLD shall be the "Operator".

PROJECT DESCRIPTION

The project area is a previously developed lot bounded by Henry Street to the west, an asphalt parking lot to the east, a vacant City of Roanoke parcel to the north, and an existing educational facility owned by the Roanoke Higher Education Authority to the south.

The existing lot is approximately 90% impervious, including compacted gravel, concrete, and brick paver surfaces; the remaining 10% is grass or mulch.

The project will re-develop the existing lot into a culinary arts educational facility owned by Roanoke Higher Education Authority and leased by Virginia Western Community College as part of the Virginia Community College System. The new facility will be connected to the existing building to its south. The new facility will contain kitchen classrooms, food storage areas, a loading/unloading area, and new lawn and patio spaces.

As part of the project, minor improvements will be made to the existing building south of the project area. Improvements include a canopy on part of the building adjacent to Henry Street and a new fence and gate adjacent to Centre Avenue for an outdoor area.

A total of approximately 21,227 square feet will be disturbed as part of this project.

EXISTING SITE CONDITIONS

The existing site is previously developed, as described above. There is an existing drainage divide running east to west approximately in the north-south center of the lot and running approximately perpendicular to the north-south property lines. The northeast quadrant of the lot drains to an existing DI-1 storm drain inlet and into the Wells Avenue storm drain network. The southeast quadrant drains to an existing DI-1 storm drain inlet and to the east along Centre Avenue. The northwest quadrant drains overland to Henry Street and into a curb inlet near the intersection of Henry Street and Wells Avenue. The southwest quadrant drains overland to Henry Street and into a curb inlet near the intersection of Henry Street and Centre Avenue. Slopes throughout the site are no more than 3%.

OFF-SITE AREAS

No off-site areas will be impacted by this plan.

SOILS

Soils at this site are classified by the Natural Resources Conservation Service as 50% Urban Land and 50% 6D-Chiswell-Litz-Urban Land complex.

Urban land typically consists of asphalt, concrete, or other impervious surfaces. Examples are highways, shopping centers, and industrial parks. Permeability, water capacity, and depth to bedrock varies, as land has been disturbed and often mixed with borrowed fill from another site.

Chiswell-Litz-Urban Land complex is well drained with a very high runoff class. The hydrological soil group is C/D.

The Contractor shall anticipate variable soil conditions, as soil is unclassified.

CRITICAL EROSION AREAS

There are no critical erosion areas associated with this site.

EROSION AND SEDIMENT CONTROL MEASURES

Unless otherwise indicated, all structural erosion and sediment control practices will be constructed and maintained in accordance with the minimum standards and specifications to the Virginia Erosion and Sediment Control Handbook, latest edition. References to VDOT refer to the Virginia Department of Transportation "Road and Bridge Standards and Specifications," latest edition.

STRUCTURAL PRACTICES

- Silt Fence - Sid. & Spec. 3.05**
 - A temporary sediment barrier consisting of a synthetics filter fabric stretched across and attached to supporting posts and entrenched.
- Storm Drain Inlet Protection - Sid. & Spec. 3.07**
 - A temporary filter placed around/over a storm drain inlet structure to filter out sediment from stormwater leaving the site.
- Temporary Right-of-Way Diversion - Sid. & Spec. 3.11**
 - A temporary gravel dam used to filter out sediment from stormwater leaving the site.

PERMANENT STABILIZATION

Permanent or temporary soil stabilization shall be applied to denuded areas within seven (7) days after final grade is reached on any portion of the site. Temporary soil stabilization shall be applied within seven (7) days to denuded areas that may not be at final grade but will remain dormant for longer than thirty (30) days. Permanent stabilization shall be applied to areas that are to be left dormant for more than one year.

EROSION AND SEDIMENT CONTROL NARRATIVE (CONT'D)

MANAGEMENT STRATEGIES

- The RLD shall be responsible for the installation and maintenance of all erosion and sediment control practices maintaining them in good and effective operating condition.
- The RLD shall notify the Architect when the local governing official has inspected and approved all in-place erosion and sediment control devices.
- Construction shall be sequenced so that the duration of grading operations is as brief as possible.
- Temporary seeding or other stabilization shall follow within 7 days after grading, or installation if a temporary measure.
- Limits of disturbance shall be honored. Any disturbance required for utility line installation shall be limited to within ten (10) feet of the utility centerline.
- No solid materials, including building materials, garbage, and debris shall be discharged to surface waters of the State, except as authorized by a Section 404 permit.
- Where sediment is transported onto a public road surface, the road shall be cleaned thoroughly at the end of each day at a minimum. Sediment shall be removed by shoveling or sweeping. Cleared sediment shall be returned to the point of likely origin or other suitable location. The generation of dust shall be minimized. Bulk clearing of accumulated sediment shall not include flushing the area with water. Street washing shall be allowed only after sediment has been so removed.
- Ensure and demonstrate compliance with applicable State and/or local wastewater disposal, sanitary sewer or septic system regulations.
- All sediment removed from sediment trapping measures or cleaning operations shall be appropriately wasted so as not to become a dust or sediment problem elsewhere.

MAINTENANCE

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

- Storm Drain Inlet Protection - sediment shall be removed and the trap restored to its original dimensions when the sediment has accumulated to one half of the design depth of the trap.
- Right-of-Way Diversion - shall be checked regularly for structural/functional integrity. Replace any damaged or eroded areas.
- Silt Fence - shall be checked regularly for structural/functional integrity. Replace or repair any damaged areas.

UNDERGROUND UTILITY INSTALLATION

Underground utility lines shall be installed in accordance with the following standards in addition to other applicable criteria:

- No more than 500 linear feet of trench may be open at one time.
- Excavated material shall be placed on the uphill side of trenches.
- 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.
- Re-establishment of disturbed area shall be accomplished in accordance with the ESC Handbook and contract documents.
- Applicable safety regulations shall be complied with.

DISPLAY & STATUS OF PLAN

Plan must be maintained on-site and kept available for inspectors at all times from the date of commencement of construction to the date of final stabilization. Note that this narrative and RLD's log of inspection reports and all certifications are part of the plan (keep with this narrative).

The Plan with all attachments, reports, etc. shall be retained by the contractor for at least three (3) years from the date that the site is finally stabilized.

Erosion and Sediment Control Minimum Standards

NOTE:

- CHECKMARK INDICATES ITEM IS APPLICABLE TO PROJECT.
- N/A - NOT APPLICABLE.

MS-1 STABILIZATION OF DENuded AREAS

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 14 days. Permanent stabilization shall be applied to areas that are to be left dormant for more than one year.

MS-2 STABILIZATION OF SOIL STOCKPILES

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.

MS-3 PERMANENT VEGETATION

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.

MS-4 TIMING AND STABILIZATION OF SEDIMENT TRAPPING MEASURES

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. INLET PROTECTION, SILT FENCE

MS-5 STABILIZATION OF EARTHEN STRUCTURES

Stabilization measures shall be applied to earthen structures such as dams, dikes and diversions immediately after installation.

MS-6 SEDIMENT BASINS

Sediment basins, traps, and sediment basins shall be designed and constructed based upon the total drainage area to be served by the trap or basin.

- 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.
- 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.

MS-7 CUT AND FILL SLOPES

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.

MS-8 CONCENTRATED RUNOFF FLOW DOWN CUT OR FILL SLOPES

Concentrated runoff shall not flow down cut or fill slopes unless contained within an adequate temporary or permanent channel, flume or slope drain structure.

MS-9 WATER SEEPS FROM A SLOPE FACE

Whenever water seeps from a slope face, adequate drainage or other protection shall be provided.

MS-10 STORM SEWER INLET PROTECTION

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.

MS-11 STABILIZATION OF OUTLETS

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.

MS-12 WORK IN LIVE WATERCOURSES

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.

MS-13 CROSSING A LIVE WATERCOURSE

When a live watercourse must be crossed by construction vehicles more than twice in any six-month period, a temporary or permanent vehicular stream crossing constructed of nonerodible material shall be provided.

MS-14 APPLICABLE REGULATIONS

All applicable federal, state and local regulations pertaining to working in or crossing live watercourses shall be met.

MS-15 STABILIZATION OF BED AND BANKS

The bed and banks of a watercourse shall be stabilized immediately after work in the watercourse is completed.

MS-16 UTILITY CONSTRUCTION

- Underground utility lines shall be installed in accordance with the following standards in addition to other applicable criteria:
 - No more than 500 linear feet of trench may be opened at one time.
- Excavated material shall be placed on the uphill side of trenches.
- 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.
- Material used for backfilling trenches shall be properly compacted in order to minimize erosion and sedimentation.
- Restabilization shall be accomplished in accordance with these regulations.
- Applicable safety regulations shall be complied with.

MS-17 CONSTRUCTION ACCESS ROUTES

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.

MS-18 TEMPORARY EROSION & SEDIMENT CONTROL MEASURE REMOVAL

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 necessary, 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.

MS-19 PROTECTION OF DOWNSTREAM PROPERTIES AND WATERWAYS

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. Stream restoration and relocation projects that incorporate natural channel design concepts are not man-made channels and shall be exempt from any flow rate capacity and velocity requirements for natural or man-made channels:

- 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.
- Adequacy of all channels and pipes shall be verified in the following manner:
 - 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
 - CONTRIBUTING DRAINAGE AREA OF THE PROJECT IS APPROXIMATELY 0.72 ACRES. CONTRIBUTING DRAINAGE AREA TO POINT OF ANALYSIS IS 920.9 ACRES. THE POINT OF ANALYSIS WATERSHED IS OVER 100X GREATER THAN THE CONTRIBUTING AREA OF THE PROJECT. SEE DRAINAGE CALCULATIONS FOR MORE INFORMATION.
- 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.
- All previously constructed man-made channels shall be analyzed by the use of a 10-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
- Pipes and storm sewer systems shall be analyzed by the use of a 10-year storm to verify that stormwater will be contained within the pipe or system.

- If existing natural receiving channels or previously constructed man-made channels or pipes are not adequate, the applicant shall:
 - Improve the channels to a condition where a 10-year storm will not overtop the banks and a two-year storm will not cause erosion to the channel, the bed, or the banks; or
 - Improve the pipe or pipe system to a condition where the 10-year storm is contained within the appurtenances;
- 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 10-year storm to increase when runoff outfalls into a man-made channel; or
- Provide a combination of channel improvement, stormwater detention or other measures which is satisfactory to the VESCP authority to prevent downstream erosion.

- The applicant shall provide evidence of permission to make the improvements.
- All hydrologic analyses shall be based on the existing watershed characteristics and the ultimate development condition of the subject project.
- If the applicant chooses an option that includes stormwater detention, he shall obtain approval from the VESCP 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.
- 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.
- All on-site channels must be verified to be adequate.
- 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.
- In applying these stormwater management 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.
- 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.
- Any plan approved prior to July 1, 2014, that provides for stormwater management that addresses any flow rate capacity and velocity requirements for natural or man-made channels shall satisfy the flow rate capacity and velocity requirements for natural or man-made channels if the practices are designed to (i) detain the water quality volume and to release it over 48 hours; (ii) detain and release over a 24-hour period the expected rainfall resulting from the one year, 24-hour storm; and (iii) reduce the allowable peak flow rate resulting from the 1.5, 2, and 10-year, 24-hour storms to a level that is less than or equal to the peak flow rate from the site assuming it was in a good forested condition, achieved through multiplication of the forested peak flow rate by a reduction factor that is equal to the runoff volume from the site when it was in a good forested condition divided by the runoff volume from the site in its proposed condition, and shall be exempt from any flow rate capacity and velocity requirements for natural or man-made channels as defined in any regulations promulgated pursuant to § 62.1-44.15:54 or 62.1-44.15:65 of the Act.
- For plans approved on and after July 1, 2014, the flow rate capacity and velocity requirements of § 62.1-44.15:52 A of the Act and this subsection shall be satisfied by compliance with water quantity requirements in the Stormwater Management Act (§ 62.1-44.15:24 at seq. of the Code of Virginia) and attendant regulations, unless such land-disturbing activities are in accordance with 9VAC25-870-48 of the Virginia Stormwater Management Program (VSPM) Regulation or are exempt pursuant to subdivision C 7 of § 62.1-44.15:34 of the Act.
- Compliance with the water quantity minimum standards set out in 9VAC25-870-66 of the Virginia Stormwater Management Program (VSPM) Regulation shall be deemed to satisfy the requirements of this subdivision 19.

KEY PLAN

GENERAL NOTES

City of Roanoke
Planning, Building, & Development

COMPREHENSIVE DEVELOPMENT PLAN

APPROVED

by ptkr1
06/02/2017

SPECTRUM DESIGN
architects | engineers

10 CHURCH AVE SE, PLAZA SUITE 1 ROANOKE, VIRGINIA 24011 540.342.6001

CLAUDE MOORE
COMPLEX ADDITION
ROANOKE, VA

PROJECT CODE #: 935-18158

SPECTRUM DESIGN PROJECT NO. 14132

STATE OF VIRGINIA
MICHAEL A. RAKES
Lic. No. 28199
9/18/2016
PROFESSIONAL ENGINEER

DATE: 18 SEPTEMBER 2016
DESIGN ARCHITECT: MAR
CHECKED BY: THL
DRAWN BY: THL
REVISIONS: NUMBER DATE

SHEET TITLE

GENERAL NOTES & E&SC NOTES

C503