I. PROJECT DESCRIPTION

THE PURPOSE OF THIS PROJECT IS TO PROVIDE DRAINAGE IMPROVEMENTS ON VARNELL AVENUE, N.E. BETWEEN 13TH STREET AND 26TH STREET IN THE CITY OF ROANOKE. THE DISTURBED AREA, OUTSIDE OF PAVEMENT, FOR THIS DRAINAGE IMPROVEMENT PROJECT IS 0.50 ACRES (21,725 SF.) THE NEW STORM PIPE LAYOUT WILL KEEP MOST OF THE SYSTEM AWAY FROM THE EXISTING SANITARY MAIN, LATERALS AND WATER MAIN ALONG VARNELL AVENUE. SOME WATER MAIN RELOCATIONS WILL BE NECESSARY TO CONSTRUCT THE STORM DRAIN SYSTEM. ONCE THE PROJECT IS COMPLETE, THE ROADS WILL BE MILLED AND PAVED.

II. EXISTING SITE CONDITIONS

THE EXISTING SITE IS ASPHALT ROADWAYS AND GRAVEL/GRASS AREAS. THE AREA GENERALLY DRAINS TO THE WESTERLY DIRECTION TOWARDS TINKER CREEK. THE EXISTING STORM DRAIN SYSTEM HAS LITTLE COVERAGE AREA AND IS UNDERSIZED. UPSTREAM OF THIS SYSTEM, THE ROADWAY GETS FLOODED EASILY. DUE TO THE CROSS-SLOPE OF THE ROAD IN SOME AREAS, MOST OF THE DRAINAGE ENDS UP ALONG THE NORTH SIDE OF VARNELL AVENUE WHICH AFFECTS THE MAJORITY OF HOMES ALONG THE ROAD. THE SOUTH SIDE OF THE ROAD HAS VERY FEW HOMES. 17TH STREET HAS BEEN ERODED ALONG THE EDGE OF THE ROAD DUE TO RUNOFF. CURB AND GUTTER AND CURB INLETS ARE PROPOSED ON THE NORTH SIDE OF VARNELL AVENUE TO KEEP THE DRAINAGE OUT OF THE MAJORITY OF HOMES' PROPERTIES. EXISTING SMALL GRASS SWALES ALONG THE SOUTH SIDE OF THE ROAD WILL BE IMPROVED AND PICK UP DRAINAGE WITH A NEW STORM PIPE UNDER THE SWALES WITH DROP INLETS. ERODED CHANNELS ALONG 17TH STREET AND VARNELL AVENUE WILL BE IMPROVED WITH CONCRETE PAVED CHANNELS.

III. ADJACENT PROPERTIES

THE PROJECT AREA IS LOCATED IN PUBLIC RIGHT OF WAY SURROUNDED BY MULTIPLE PRIVATE PROPERTY OWNERS.

IV. OFF-SITE AREAS

UNSUITABLE MATERIAL WILL BE HAULED FROM THE SITE AND DISPOSED OF AT A LAND DISTURBANCE PERMITTED SITE.

V. SOILS

ACCORDING TO THE USDA SCS SOILS MAPPING, THE PROJECT SITE LIES ON: 96.6% 5E, CHISWELL-LITZ COMPLEX, 25 TO 50% SLOPES. THE COMPOSITION IS AS FOLLOWS:

45% CHISWELL (HYDROLOGIC SOIL GROUP D):
SURFACE LAYER (0 TO 2 INCHES) CHANNERY SILT LOAM
SUBSOIL (2 TO 12 INCHES), VERY CHANNERY SILT LOAM
SUBSTRATRUM (12 TO 22 INCHES) BEDROCK
25% LITZ (HYDROLOGIC SOIL GROUP C):
SURFACE LAYER (0 TO 5 INCHES) CHANNERY SILT LOAM
SUBSOIL (5 TO 24 INCHES), VERY CHANNERY SILT LOAM
SUBSTRATRUM (24 TO 34 INCHES) BEDROCK
3.4% URBAN LAND

THE URBAN LAND CONSISTS OF ASPHALT, CONCRETE, BUILDINGS, OR OTHER IMPERVIOUS SURFACES.

THE EROSION POTENTIAL IS SLIGHT, THE PERMEABILITY IS WELL DRAINED AND THE SURFACE RUNOFF IS MODERATE.

VI. CRITICAL AREAS

THE ENTIRE PROJECT IS CONSIDERED CRITICAL DUE TO THE CLOSE PROXIMITY OF THE SITE TO TINKER CREEK. STORM STRUCTURES WILL BE CONSTRUCTED AND BACKFILLED/RESTORED IN A TIMELY MANNER PREVENT SEDIMENT FROM ENTERING THE CREEK.

VII. EROSION AND SEDIMENT CONTROL MEASURES

ALL VEGETATIVE EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE CONSTRUCTED AND MAINTAINED BY THE CONTRACTOR IN ACCORDANCE WITH THE LATEST EDITION OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK.

A. STRUCTURAL PRACTICES
   1. SILT FENCE (SF)
   2. DROP INLET PROTECTION (IP)
   3. CURB INLET PROTECTION (IP)

B. VEGETATIVE PRACTICES
   1. PERMANENT SEEDING (PS) (SPECIFICATION THIS SHEET) WILL BE PROVIDED ON ALL DISTURBED AREAS ALREADY CONTAINING GRASS.
   2. TEMPORARY SEEDING (TS) (SPECIFICATION THIS SHEET) WILL BE PROVIDED ON ALL DISTURBED AREAS ALREADY CONTAINING GRASS.
   3. MULCHING (MU), SPEC 3.35 WILL BE USED IN CONJUNCTION WITH SEEDING.

C. MANAGEMENT STRATEGIES

   1. CONSTRUCTION WILL BE PLANNED SO THAT TRENCHING AND EXCAVATING OPERATIONS CAN BEGIN AND END AS SOON AS POSSIBLE.

   2. SOIL STOCKPILES SHALL NOT BE ALLOWED.

   3. CLASS II RIP RAP SHALL BE INSTALLED IMMEDIATELY FOLLOWING ENDWALL AND END PIPE CONSTRUCTION.

   4. PREVIOUSLY GRASSED AREAS SHALL BE SEEDED AND STRAW MULCHED IMMEDIATELY AFTER STORM STRUCTURE INSTALLATION.

   5. PERMANENT VEGETATION SHALL NOT BE CONSIDERED ESTABLISHED UNTIL A GROUND COVER IS ACHIEVED THAT IS UNIFORM, MATURE ENOUGH TO SURVIVE AND WILL INHIBIT EROSION.

D. MAINTENANCE
   1. DAMAGE TO EROSION CONTROL MEASURES CAUSED BY CONSTRUCTION TRAFFIC OR OTHER ACTIVITY SHALL BE REPAIRED BEFORE THE END OF EACH WORKING DAY.
   2. MAINTAIN ALL SEEDED AREAS UNTIL A UNIFORM STAND IS ACCEPTED. AREAS WHICH FAIL TO ESTABLISH VEGETATIVE COVER ADEQUATE TO PREVENT RILL EROSION WILL BE RESEEDED AND MULCHED AS SOON AS SUCH AREAS ARE IDENTIFIED.
   3. SILT FENCE BARRIERS AND INLET PROTECTION MEASURES WILL BE CHECKED DAILY FOR UNDERMINING OR DETERIORATION OF THE FABRICE. SEDIMENT SHALL BE REMOVED WHEN THE LEVEL REACHES HALF WAY TO THE TOP OF THE BARRIER.

VIII. MINIMUM STANDARDS (MS):

ALL APPLICABLE VIRGINIA EROSION AND SEDIMENT CONTROL REGULATIONS AND MINIMUM STANDARDS SHALL BE ADHERED TO DURING ALL PHASES OF CONSTRUCTION. THESE INCLUDE, BUT ARE NOT LIMITED TO THE FOLLOWING:

MS-1: STABLIZATION OF DENUDED AREAS:
PERMANENT OR TEMPORARY SOIL STABILIZATION SHALL BE APPLIED TO BARE AREAS WITHIN 7 DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE UNLESS OTHERWISE SHOWN. TEMPORARY SOIL STABILIZATION SHALL BE APPLIED WITHIN 7 DAYS TO DENUDED AREAS THAT MAY NOT BE AT FINAL GRADE, BUT REMAIN DORMANT OR UNDISTURBED FOR LONGER THAN 14 DAYS. PERMANENT STABILIZATION SHALL BE APPLIED TO AREAS THAT ARE TO BE LEFT DORMANENT FOR MORE THAN ONE YEAR.

RESPONSE: DISTURBED AREAS MUST BE SEEDED WITHIN 7 DAYS IF THEY ARE NOT IN GRAVEL/PAVED AREAS.

MS-2: STABILIZATION OF SOIL STOCKPILES
DURING CONSTRUCTION OF THE PROJECT, SOIL STOCKPILES SHALL BE STABILIZED OR PROTECTED WITH SEDIMENT TRAPPING MEASURES. THE APPLICANT IS RESPONSIBLE FOR TEMPORARY PROTECTION AND PERMANENT STABILIZATION OF ALL STOCKPILES ON THE SITE AS WELL AS SOIL INTENTIONALLY TRANSPORTED FROM THE PROJECT SITE.

RESPONSE: SOIL STOCK PILES SHALL NOT BE ALLOWED.

MS-3: PERMANENT VEGETATIVE COVER
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, IN THE OPTION OF THE LOCAL AUTHORITY (CITY OF ROANOKE), IS UNIFORM AND MATURE ENOUGH TO SURVIVE.

RESPONSE: DISTURBED AREAS WILL BE SEEDED IF THEY ARE NOT IN GRAVEL/PAVED AREAS.

MS-4: TIMING AND STABILIZATION OF SILT TRAPPING MEASURES
SEDIMENT TRAPS, STORM DRAIN INLET PROTECTION, SILT FENCING AND OTHER MEASURES INTENDED TO TRAP SEDIMENT SHALL BE CONSTRUCTED AS A FIRST STEP IN ANY LAND DISTURBING ACTIVITY. THE STRUCTURES SHALL BE MADE FUNCTIONAL BEFORE UPSLOPE LAND DISTURBANCE TAKES PLACE.

RESPONSE: INLET PROTECTION SHALL BE INSTALLED AS SHOWN ON PLANS PRIOR TO ANY UPSLOPE LAND DISTURBANCE ACTIVITY

MS-5: STABILIZATION OF EARTHEN STRUCTURES:
STABILIZATION MEASURES SHALL BE APPLIED TO EARTHEN STRUCTURES SUCH AS DAMS, DIKES AND DIVERSIONS IMMEDIATELY AFTER INSTALLATION.

RESPONSE: NOT APPLICABLE

MS-6: SEDIMENT BASINS:
A SEDIMENT BASIN SHALL CONTROL SURFACE RUNOFF FROM DISTURBED AREAS THAT ARE COMPRISED OF FLOW FROM DRAINAGE AREAS GREATER THAN OR EQUAL TO 3 ACRES. THE SEDIMENT BASIN SHALL BE DESIGNED AND CONSTRUCTED TO ACCOMODATE THE ANTICIPATED SEDIMENT LOADING FOR THE LAND DISTURBING ACTIVITY. THE OUTFALL DEVICE OR SYSTEM DEVICE SHALL TAKE INTO ACCOUNT THE TOTAL DRAINAGE AREA FLOWING THROUGH THE DISTURBED AREA TO BE SERVED BY THE BASIN.

RESPONSE: NOT APPLICABLE.

MS-7 CUT AND FILL SLOPES:
CUT AND FILL SLOPES SHALL BE CONSTRUCTED IN A MANNER THAT WILL MINIMIZE EROSION. SLOPES THAT ARE FOUND TO ERODING EXCESSIVELY WITHIN ONE YEAR OF PERMANENT STABILIZATION SHALL BE PROVIDED WITH ADDITIONAL SLOPE STABILIZING MEASURES UNTIL PROBLEM IS CORRECTED.

RESPONSE: ONE SMALL CUT SLOPE EXISTS IN PROJECT WILL BE MONITORED DURING 1 YEAR WARRANTY PERIOD. ADDITIONAL EROSION CONTROL MEASURES WILL BE UTILIZED IF NECESSARY.

MS-8 CONCENTRATED RUNOFF 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.

RESPONSE: THE SINGLE CUT SLOPE ON THE PROJECT DOES NOT HAVE A CONCENTRATED FLOW ABOVE IT.

MS-9 WATER SEEPS FROM A SLOPE FACE:
WHENEVER WATER SEEPS FROM A SLOPE FACE, ADEQUATE DRAINAGE OR OTHER PROTECTION SHALL BE PROVIDED.

RESPONSE: NOT APPLICABLE.

MS-10 STORM SEWER INLET PROTECTION:
ALL STORM SEWER INLETS SHALL BE PROTECTED SO THAT SEDIMENT-LADEN WATER CANNOT ENTER THE CONVEYANCE SYSTEM WITHOUT FIRST BEING FILTERED OR OTHERWISE TREATED TO REMOVE SEDIMENT.

RESPONSE: INLET PROTECTION IS PROVIDED AT ALL INLETS.

MS-11 STABILIZATION OF OUTLETS:
BEFORE NEWLY CONSTRUCTED STORMWATER CONVEYANCE CHANNELS ARE MADE OPERTIONAL, ADEQUATE OUTLET PROTECTION AND ANY REQUIRED TEMPORARY OR PERMANENT CHANNEL LINING SHALL BE INSTALLED IN BOTH THE CONVEYANCE CHANNEL AND RECEIVING CHANNEL.

RESPONSE: AFTER EW-1 AND CONNECTING PIPE IS INSTALLED THE CONTRACTOR SHALL INSTALL CLASS II RIPRAP OVER GEOTECTILE FABRIC IMMEDIATELY.

MS-12 WORK IN LIVE WATERCOURSES:
PRECAUTIONS SHALL BE TAKEN TO MINIMIZE ENCROACHMENT AND SEDIMENT TRANSPORT WHEN WORKING IN LIVE WATERCOURSES. THE WORK AREA SHALL BE STABILIZED TO THE GREATEST EXTENT POSSIBLE DURING CONSTRUCTION OF CAUSEWAYS AND COFFERDAMS. EARTHEN FILL MAY BE USED FOR THESE STRUCTURES IF ARMORED BY NONERODIBLE COVER MATERIALS.

RESPONSE: CLASS II RIP RAP SHALL BE INSTALLED OVER GEOTEXTILE FABRIC IMMEDIATELY FOLLOWING INSTALLATION OF VDOT EW-1 AND END PIPE.

MS-13 CROSSING A LIVE WATERCOURSE:
WHEN A LIVE WATERCOURSE MUST BE CROSSED BY CONSTRUCTION VEHICLES MORE THAN TWICE IN ONE MONTH PERIOD, A TEMPORARY STREAM CROSSING CONSTRUCTED OF NONERODIBLE MATERIALS SHALL BE PROVIDED.

RESPONSE: NOT APPLICABLE

MS-14 APPLICABLE REGULATIONS:
ALL APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS PERTAINING TO WORKING IN OR CROSSING A LIVE WATERCOURSE SHALL BE MET.

RESPONSE: NOT APPLICABLE

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.

RESPONSE: CLASS II RIP RAP SHALL BE INSTALLED OVER GEOTEXTILE FABRIC IMMEDIATELY FOLLOWING INSTALLATION OF VDOT EW-1 AND END PIPE.

MS-16 UNDERGROUND UTILITIES
UNDERGOUND UTILITIES 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 OPEN AT ONE TIME.
B: EXCAVATED MATERIAL SHALL BE PLACED ON THE UPHILL SIDE OF TRENCHES.
C: EFFLUENT FOR 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 OFFSITE PROPERTY.
D: RESTABILIZATION SHALL BE ACCOMPLISHED IN ACCORDANCE WITH THESE REGULATIONS.
E: APPLICABLE SAFETY REGULATIONS SHALL BE COMPILED WITH AT ALL TIMES

RESPONSE: THIS PROJECT SHALL HAVE STRICTER REQUIREMENTS OF NO MORE THAN 100 LINEAR FEET OF TRENCH BEING OPEN AT ONE TIME TO LIMIT EXPOSED DISTURBED AREAS.

MS-17 CONSTRUCTION ACCESS ROUTES:
WHERE CONSTRUCTION VEHICLE ACCESS ROUTES INTERSECT PAVED ROADS, PROVISIONS SHALL BE MADE TO MINIMIZE THE TRANSPORT OF SEDIMENT BY VEHICULAR TRACKING ON TO PAVED SURFACES.

RESPONSE: IT IS NOT ANTICIPATED CONSTRUCTION TRAFFIC WILL BE TRACKING SEDIMENT DUE TO THE LINEAR NATURE OF THE PROJECT AND THE MAJORITY OF TRAFFIC NEVER LEAVING PAVED SURFACES.

MS-18 TEMPORARY E&S CONTROL MEASURE REMOVAL:
ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION OR AFTER TEMPORARY MEASURES ARE NO LONGER NEEDED, UNLESS OTHERWISE AUTHORIZED BY THE LOCAL AUTHORITY (CITY OF ROANOKE).

RESPONSE: ALL E&S CONTROL MEASURES SHALL BE REMOVED UPON STABILIZATION OF SURROUNDING AND UPSTREAM AREAS AND ONCE APPROVED BY THE DEVELOPMENT REVIEW STAFF.

MS-19 ADEQUACY OF RECEIVING CHANNELS
PROPERTIES AND WATERWAYS DOWNSTREAM FROM THE DEVELOPMENT SITE SHALL BE PROTECTED FROM SEDIMENT DEPOSITION, EROSION, AND DAMAGE DUE TO INCREASES IN VOLUME, VELOCITY, AND PEAK FLOW RATES OF STORM WATER RUNOFF FOR 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; AND
   b. ALL PREVIOUSLY CONSTRUCTED MAN-MADE CHANNELS SHALL BE ANALYZED BY THE USE OF A TEN-YEAR STORM 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 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 CAUSED 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 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.

RESPONSE: THIS PROJECT IS CLASSIFIED AS A LINEAR DEVELOPMENT PROJECT SINCE IT'S CONSTRUCTION WILL PREDOMINANTLY BE CARRIED OUT WITHIN THE CITY OF ROANOKE RIGHT OF WAY. THE LAND DISTURBING ACTIVITIES ARE LINEAR IN NATURE WITH THE INSTALLATION OF APPROXIMATELY 2,540 FEET OF RCP AND 1,850 FEET OF CURB AND GUTTER. THE TAILWATER CONDITION AT THE OUTLET POINT IN TINKER CREEK DURING STORM EVENTS WILL PREVENT EROSION. THE FEMA FLOOD PROFILE SHOWS THE 10 YEAR ELEVATION AT 10.2 FEET HIGHER THAN THE OUTLET PIPE INVERT. DUE TO THIS ONLY THE DISTURBED AREA IMMEDIATELY AROUND THE NEW ENDWALL WILL BE COVERED IN CLASS II RIP RAP TO MINIMIZE DISTURBANCE AT THE CREEK. THE CALCULATIONS PROVIDED ARE PERFORMED CONSERVATIVELY IN A ZERO TAILWATER CONDITION. AS EACH INLET STRUCTURE IS CONSIDERED TO BE AN OUTFALL, THE CONSTRUCTION OF THIS LINEAR DEVELOPMENT PROJECT WILL BE EXEMPTED FROM STORMWATER MANAGEMENT REQUIREMENTS FOR THE FOLLOWING REASONS:

1. LESS THAN ONE (1) ACRE OF LAND WILL BE DISTURBED PER OUTFALL. SEE SHEET 4 FOR ALL DISTURBED AREA MEASURE.
2. THERE IS AN INCREASE IN THE PEAK FLOW RATE COMPARING THE EXISTING AND PROPOSED CONDITION USING THE OUTFALL TO TINKER CREEK AS THE POINT OF ANALYSIS. DESPITE THIS INCREASE, STORM WATER IS DIRECTED TO A DESIGNATED FEMA FLOODPLAIN WHICH IS CONSIDERED TO BE AN ADEQUATE SYSTEM.
3. THERE WILL BE NO ANTICIPATED EROSION PROBLEM DOWNSTREAM OF THE DISCHARGE POINT AFTER THE CONSTRUCTION OF THIS PROJECT.

IX. STORMWATER MANAGEMENT:

THERE ARE NO PROPOSED STORM WATER MANAGEMENT FACILITIES.

X. SOIL STOCKPILES AND BORROW AREAS:

NO STOCK PILES ARE ALLOWED IN PROJECT AND NO BORROW AREAS ARE REQUIRED.

XI. SEQUENCE OF CONSTRUCTION

1. CONSTRUCT STORM STRUCTURES STARTING FROM DOWNSTREAM END.
2. IMMEDIATELY BACKFILL TRENCH / EXCAVATION AREA.
3. IN GRASSY AREAS, PROVIDE PERMANENT SEEDING, MULCH, AND STABILIZE ALL DISTURBED AREAS.
4. IN GRAVEL AREAS, RESTORE GRAVEL IMMEDIATELY AFTER BACKFILLING TRENCH.
5. PERMANENT VEGETATION MUST BE PROTECTED THROUGHOUT PROJECT.
6. REMOVE SILT FENCE ONCE VEGETATION IS ESTABLISHED
7. CLOSE OUT PROJECT

XII. PROPERTY OWNER

CITY OF ROANOKE, VA
215 CHURCH AVENUE, SW
ROANOKE, VA 24011

TEMPORARY SEEDING MIXTURE (TS)

DESCRIPTION	% BY WEIGHT
TEMPORARY SEEDING	
ANNUAL RYE GRASS	100
RATE: 2 POUNDS PER 1000 SQUARE FEET	
ROWING DATES: FEBRUARY 16 TO APRIL 30	
ANNUAL RYE GRASS / WINTER RYE MIX	
ANNUAL RYE	50
WINTER RYE	50
RATE: 2 POUNDS PER 1000 SQUARE FEET	
SOWING DATES: SEPTEMBER 1 TO FEBRUARY 15	
GERMAN MILLET	
RATE: 1 POUND PER 1000 SQUARE FEET	
SOWING DATES: MAY 1 TO AUGUST 31	

PERMANENT SEEDING MIXTURE (PS)

TYPE A

15 OCTOBER TO 1 FEBRUARY
K-31 FESCUE @ 5 LB / 1000 SF
BORZY WINTER RYE @ 1/2 LB / 1000 SF

1 FEBRUARY TO 1 JUNE
K-31 FESCUE @ 5 LB / 1000 SF
ANNUAL RYE @ 1/2 LB / 1000 SF

1 JUNE TO 1 SEPTEMBER
K-31 FESCUE @ 5 LB / 1000 SF
GERMAN MILLET @ 1/2 LB / 1000 SF

1 SEPTEMBER TO 15 OCTOBER
K-31 FESCUE @ 5 LB / 1000 SF
ANNUAL RYE @ 1/2 LB / 1000 SF

TYPE B (SLOPES 3:1 OR STEEPER)

15 MARCH TO 1 MAY
CROWN VETCH @ 1/2 LB / 1000 SF
PERENNIAL RYEGRASS @ 1/2 LB / 1000 SF
RED TOP @ 1/8 LB / 1000 SF

15 AUGUST TO 1 OCTOBER
CROWN VETCH @ 1/2 LB / 1000 SF
PERENNIAL RYEGRASS @ 1/2 LB / 1000 SF
RED TOP @ 1/8 LB / 1000 SF

LIME: 140 LB / 1000 SF PULVERIZED AGRICULTURAL LIMESTONE

FERTILIZER: 5-20-10 @ 25 LB / 1000 SF
38-0-0 @ 7 LB / 1000 SF

MULCH: IF REQUIRED, SHALL BE USED OVER ALL SEEDED AREAS AND SHALL BE APPLIED IN ACCORDANCE WITH SECTION 1.75 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST EDITION.

SOIL CONDITIONING: INCORPORATION OF LIME AND FERTILIZER, SELECTION OF CERTIFIED SEED, MULCHING, MAINTENANCE OF NEW SEEDLINGS, AND RESEEDING SHALL BE IN ACCORDANCE WITH SPECIFICATIONS CONTAINED WITHIN THE VIRGINIA SOIL EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST EDITION. ADDITIONAL SEEDING TO BE PERFORMED AS REQUIRED BY THE INSPECTOR.

SEED APPLICATION: APPLY SEED UNIFORMLY WITH A CYCLONE SEEDER, DRILL, CULTIPACKER SEEDER, OR HYDROSEEDER ON A FIRM, FRIABLE, SEEDBED. MAXIMUM SEEDING DEPTH SHALL BE 1/4 INCH.

ROANOKE
OFFICE OF THE
CITY ENGINEER
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ROOM 350
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DESIGNED: ARG
DRAWN: ARG
CHECKED: JJK

COMMONWEALTH OF VIRGINIA
JOSEPHUS M. JOHNSON-KOROMA
Lic. No. 46165
05/05/14
PROFESSIONAL ENGINEER

REV.	DATE:	DESCRIPTION
1	02/05/14	RESUBMITTAL AFTER 1ST COMMENTS

DATE: 11/19/2013
SCALE: 1"=20'-0" 24"x36" SHEET

VARNELL AVENUE DRAINAGE IMPROVEMENTS PROJECT
CITY OF ROANOKE, VIRGINIA
EROSION AND SEDIMENT CONTROL NOTES

APPROVED AUG 04 2014

SHEET 2 OF 10
PLAN NO. 6758