

SOIL EROSION CONTROL NARRATIVE

PROJECT DESCRIPTION:

THE PURPOSE OF THIS PROJECT IS TO INSTALL ADDITIONAL WATERLINE THROUGHOUT THE PROPERTY. THERE WILL NOT BE ANY INCREASE IN IMPERVIOUS AREA AS THE GROUND DISTURBED WILL BE REPAIRED TO MATCH EXISTING CONDITIONS. THIS PROJECT WILL DISTURB NO MORE THAN 3.61 ACRES (157,180 SF). THE EROSION & SEDIMENT CONTROL MEASURES SHOWN HERE ARE DESIGNED IN ACCORDANCE WITH THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VA ESCH).

EXISTING SITE CONDITIONS:

THE EXISTING SITE IS DEVELOPED WITH A MANUFACTURING PLANT / STORAGE YARD. THE PURPOSE OF THE PLANT IS TO MANUFACTURE AND STORE MATERIAL NEEDED FOR INSTALLATION AND REPAIR OF RAILROADS.

ADJACENT PROPERTY:

ADJOINING OWNERS ARE SHOWN ON THE PLANS. THE PROPERTY IS BOUNDED BY THE ROANOKE RIVER TO THE WEST AND THE NORFOLK & SOUTHERN RAILROAD (N/ S & W RAILWAY) ON THE NORTH AND SOUTH. PROPERTY TO THE EAST IS OWNED BY KOPPERS INDUSTRIES, INC. NO MAJOR IMPACTS WILL OCCUR TO ADJOINING PROPERTIES. RUNOFF IS BEING DETAINED AND/OR INFILTRATED WITHIN THE DEVELOPMENT AREA. OVERFLOW RUNOFF CONTINUES THE EXISTING PATH TO AN EXISTING SUMP AREA ADJACENT THE RAILROAD.

OFF-SITE AREAS:

THIS PROJECT DOES NOT ANTICIPATE THE NEED FOR OFF-SITE WASTE AREAS. IF SOIL IS NEEDED TO BE HAULED OFF-SITE, THE CONTRACTOR SHALL PROVIDED THE LOCATION OF THESE AREAS TO THE GOVERNING AUTHORITY. EROSION CONTROL PLANS OR MEASURES WILL BE REQUIRED FOR THESE OFF-SITE LOCATIONS OR MAY ALREADY BE IN PLACE.

SOILS:

57A—Wheeling-Urban land complex, 0 to 2 percent slopes, rarely flooded

Map Unit Setting

National map unit symbol: kggv
Mean annual precipitation: 30 to 45 inches
Mean annual air temperature: 50 to 57 degrees F
Frost-free period: 171 to 207 days
Farmland classification: Not prime farmland

Map Unit Composition

Wheeling and similar soils: 40 percent
Urban land: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wheeling

Setting

Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from limestone, sandstone, and shale

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 71 inches: loam
H3 - 71 to 75 inches: gravelly sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Available water storage in profile: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Urban Land

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 10 inches to

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: No

CRITICAL EROSION AREAS:

SHOULD EROSION BECOME EVIDENT IN AREAS, CONTRACTOR SHALL STABILIZE AREAS WITH TEMPORARY SEEDING, BLANKET MATTING AND/OR HYDROMULCHING.

EROSION & SEDIMENT CONTROL MEASURES:

UNLESS OTHERWISE INDICATED, ALL VEGETATIVE AND STRUCTURAL EROSION AND SEDIMENT CONTROL PRACTICES WILL BE CONSTRUCTED AND MAINTAINED ACCORDING TO THE MINIMUM STANDARDS AND SPECIFICATIONS OF THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK", THIRD EDITION. ADDITIONAL REFERENCE IS DIRECTED TO THE SUBMITTAL PACKAGE FOR THE PROJECT DESCRIBING EACH EROSION & SEDIMENT CONTROL MEASURE, AND WHETHER THAT MEASURE IS ANTICIPATED WITH THIS PROJECT.

1. REGARDLESS OF FUTURE DEVELOPMENT PLANS, THE CONTRACTOR SHALL IMMEDIATELY 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.

2. AFTER THE INSTALLED CONTROL DEVICES ARE FOUND TO BE FUNCTIONAL, THE CONTRACTOR SHALL IMMEDIATELY PROCEED WITH DEMOLITION, CLEARING, AND PRELIMINARY GRADING OPERATIONS. ALL EXPOSED DENUDED AREAS SHALL BE SEEDD WITHIN SEVEN (7) DAYS AFTER FINAL GRADING, AND SHALL BE ACCOMPLISHED IN STRICT ACCORDANCE WITH THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK", THIRD EDITION.

3. IN GENERAL, ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED WEEKLY AND AFTER EACH SIGNIFICANT RAINFALL. IN PARTICULAR:

- A. MEASURES SHALL BE MAINTAINED TO PREVENT TRACKING OR FLOW OF MUD ONTO PUBLIC RIGHT-OF-WAYS.
- B. ALL SILT FENCE BARRIERS AND INLET PROTECTIONS SHALL BE CHECKED REGULARLY FOR UNDERMINING AND SEDIMENT BUILDUP.
- C. ALL SEEDD AREAS WILL BE CHECKED REGULARLY TO SEE THAT A GOOD STAND IS MAINTAINED. AREAS SHALL BE FERTILIZED AND RESEEDD AS NEEDED.

4. 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 THAT 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, ORGANIZED MANNER.

STRUCTURAL PRACTICES

Listed and described below are various structural practices used for this project.

Temporary Construction Entrance (3.02) – A stone pad, located at points of vehicular ingress and egress on a construction site, to reduce the soil transported onto public roads and other paved areas. A TEMPORARY CONSTRUCTION ENTRANCE HAS BEEN INCLUDED IN THIS PROJECT AND IS SHOWN ON THE DRAWINGS.

Silt Fence (3.05) – A temporary sediment barrier constructed of posts, filter fabric and, in some cases, a wire support fence, placed across or at the toe of a slope or in a minor drainage way to intercept and detain sediment and decrease flow velocities from drainage areas of limited size; applicable where sheet and rill erosion or small concentrated flows may be a problem. Maximum effective life of 6 months. SILT FENCE WILL BE USED ON THIS FOR TEMPORARY STOCKPILE AREAS.

Topsoiling (3.30) – Preserving and using topsoil to provide a suitable growth medium for vegetation used to stabilize disturbed areas. Applicable where preservation or importation of topsoil is most cost-effective method of providing a suitable growth medium; not recommended for slopes steeper than 2:1 unless additional measures are taken to prevent sloughing and erosion. Topsoil may be stockpiled, protected from erosion, and then redistributed for lawn/grass areas. Exact location shall be determined by the Contractor.

Temporary Seeding (3.31) – Establishment of temporary vegetative cover on disturbed areas that will not be brought to final grade for 30 days to one year by seeding with appropriate rapidly-growing plants. Temporary Seeding is planned for this development.

Permanent Seeding (3.32) – Establishment of perennial vegetative cover by planting seed on rough-graded areas that will not be brought to final grade for a year or more or where permanent, long-lived vegetative cover is needed on fine-graded areas. Permanent Seeding will be used on all finished areas outside of the parking areas.

Mulching (3.35) – Application of plant residues or other suitable materials to disturbed surfaces to prevent erosion and reduce overland flow velocities. Fosters plant growth by increasing available moisture and providing insulation against extreme heat or cold. Should be applied to all seeding operations, themselves, and bare areas which cannot be seeded due to the season but which still need protection to prevent soil loss.

Dust Control (3.39) – Reducing surface and air movement of dust during land disturbance, demolition or construction activities in areas subject to dust problems in order to prevent soil loss and reduce the presence of potentially harmful airborne substance. Dust Control will be practiced to keep dust generation to reasonable levels.

MAINTENANCE

ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE CHECKED DAILY AND AFTER ALL SIGNIFICANT RAINFALL. IN PARTICULAR:

1. SILT FENCE AND INLET PROTECTION SHALL BE CHECKED REGULARLY TO ENSURE THAT THE FABRIC HAS NOT BEEN UNDERMINED OR HAS DETRIORATED. SEDIMENT SHALL BE REMOVED WHEN LEVEL OF BUILDUP REACHES HALFWAY UP THE BARRIER.
2. AREAS WHICH HAVE RECEIVED SEEDING SHALL BE CHECKED REGULARLY TO ENSURE THAT A GOOD STAND OF GRASS IS MAINTAINED. AREAS SHALL BE FERTILIZED AND RESEEDD AS REQUIRED.

SPECIFIC REQUIREMENTS RELATED TO INSPECTION AND MAINTENANCE OF EACH EROSION CONTROL MEASURE ARE DISCUSSED IN THE VESCH STANDARDS AND SPECIFICATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE OF ALL EROSION CONTROL MEASURES TO THE SATISFACTION OF LOCAL REVIEWING AUTHORITIES, AS WELL AS THE INSTALLATION OF ADDITIONAL MEASURES AS NEEDED TO ENSURE THAT SEDIMENT LADEN RUNOFF DOES NOT LEAVE THE SITE.

GENERAL EROSION & SEDIMENT CONTROL NOTES

1. ALL SOIL EROSION & SEDIMENT CONTROL MEASURES AS SHOWN ON THE PLAN SHALL BE ACCOMPLISHED IN STRICT ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS CONTAINED IN THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST EDITION.

2. THE APPROVING AUTHORITY MAY ADD TO, DELETE, RELOCATE, CHANGE, OR OTHERWISE MODIFY CERTAIN EROSION AND SEDIMENT CONTROL MEASURES WHERE FIELD CONDITIONS ARE ENCOUNTERED THAT WARRANT SUCH MODIFICATIONS.

3. ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES AS SHOWN ON THE PLAN SHALL BE PLACED IN ADVANCE OF THE WORK BEING PERFORMED, AS FAR AS PRACTICAL.

4. IN NO CASE DURING CONSTRUCTION SHALL WATER RUNOFF BE DIVERTED OR ALLOWED TO FLOW TO LOCATIONS WHERE ADEQUATE PROTECTION HAS NOT BEEN PROVIDED.

5. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO LEAVE THE SITE ADEQUATELY PROTECTED AGAINST EROSION, SEDIMENTATION, OR ANY DAMAGE TO ANY ADJACENT PROPERTY AT THE END OF EACH DAY'S WORK.

6. FOR THE EROSION CONTROL KEY SYMBOLS SHOWN ON THE PLANS, REFER TO THE VIRGINIA UNIFORM CODING SYSTEM FOR EROSION AND SEDIMENT CONTROL PRACTICES CONTAINED IN THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST EDITION.

EROSION & SEDIMENT CONTROL MINIMUM STANDARDS

MS-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 14 DAYS. PERMANENT STABILIZATION SHALL BE APPLIED TO AREAS THAT ARE TO BE LEFT DORMANT FOR MORE THAN ONE YEAR. **TEMPORARY AND PERMANENT SEEDING ARE NEEDED FOR THIS PROJECT AND ARE SHOWN ON THE PLANS.**

MS-2 DURING CONSTRUCTION OF THE PROJECT, SOIL STOCK PILES 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. **STOCKPILING IS REQUIRED AND THE LOCATION FOR STOCKPILING SHALL BE DETERMINED BY THE CONTRACTOR.**

MS-3 A PERMANENT VEGETATIVE COVER SHALL BE ESTABLISHED ON DENUDED AREAS NOT OTHERWISE PERMANENTLY STABILIZED. PERMANENT VEGETATION SHALL NOT BE CONSIDERED UNTIL A GROUND COVER IS ACHIEVED THAT IS UNIFORM, MATURE ENOUGH TO SURVIVE AND WILL INHIBIT EROSION. **ADEQUATE SYMBOLS, DETAILS, AND NOTES ARE PROVIDED ON THE PLAN FOR DIRECTION.**
MS-4 SEDIMENT BASIN, TRAP, PERIMETER DIKE, SEDIMENT BARRIER, 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. **SILT FENCE WILL BE REQUIRED FOR STOCKPILE AREAS BUT SPECIFIC LOCATIONS ARE NOT SHOWN ON THE PLANS AS THE CONTRACTOR IS TO DETERMINE SUITABLE LOCATIONS FOR STOCKPILE AREA.**

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

MS-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.

MS-7 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.

MS-8 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 25-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-9 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 SOLE STABILIZING MEASURES UNTIL THE PROBLEM IS CORRECTED.

MS-10 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-11 WHENEVER WATER SEEPS FROM A SLOPE FACE, ADEQUATE DRAINAGE OR OTHER PROTECTION SHALL BE PROVIDED.

MS-12 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-13 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-14 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 MATERIALS.

MS-15 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.

MS-16 ALL APPLICABLE FEDERAL, STATE AND LOCAL REQUIREMENTS PERTAINING TO WORKING IN OR CROSSING LIVE WATERCOURSES SHALL BE MET.

MS-17 THE BED AND BANKS OF A WATERCOURSE SHALL BE STABILIZED IMMEDIATELY AFTER WORK IN THE WATERCOURSE IS COMPLETED.

MS-18 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. RE-STABILIZATION SHALL BE ACCOMPLISHED IN ACCORDANCE WITH THIS CHAPTER.
- f. APPLICABLE SAFETY REQUIREMENTS SHALL BE COMPLIED WITH.

THE CONTRACTOR SHALL FOLLOW MS-16 WHEN INSTALLING UTILITIES.

MS-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. **MEASURES TO ADDRESS THE CONSTRUCTION ENTRANCE IS PROVIDED ON THE PLAN.**

MS-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 VESOP 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. **CONTRACTOR SHALL FOLLOW MS-18 ONCE FINAL GRADE IS MET AND CONSTRUCTION IS FINISHED.**

MS-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: 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.

MS-20 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.

MS-21 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 CHANNEL 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.
- (b) 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
- (c) 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.
- (d) IF EXISTING NATURAL RECEIVING CHANNELS OR PREVIOUSLY CONSTRUCTED MAN-MADE CHANNELS OR PIPES ARE NOT ADEQUATE, THE APPLICANT SHALL:

- (1) 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
- (2) IMPROVE THE PIPE OR PIPE SYSTEM TO A CONDITION WHERE THE 10-YEAR STORM IS CONTAINED WITHIN THE APPURTENANCES;
- (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 10-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 VESOP AUTHORITY TO PREVENT DOWNSTREAM EROSION.

MS-22 THE APPLICANT SHALL PROVIDE EVIDENCE OF PERMISSION TO MAKE THE IMPROVEMENTS.

MS-23 ALL HYDROLOGIC ANALYSES SHALL BE BASED ON THE EXISTING WATERSHED CHARACTERISTICS AND THE ULTIMATE DEVELOPMENT CONDITION OF THE SUBJECT PROJECT.

MS-24 IF THE APPLICANT CHOOSES AN OPTION THAT INCLUDES STORMWATER DETENTION, HE SHALL OBTAIN APPROVAL FROM THE VESOP 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.

MS-25 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.

MS-26 ALL ON-SITE CHANNELS MUST BE VERIFIED TO BE ADEQUATE.

MS-27 INCREASED VOLUMES OF SHEET FLOWS THAT MAY CAUSE EROSION OR SEDIMENTATION ON ADJACENT PROPERTY SHALL BE DIVERTED TO A STABLE OUTFALL, ADEQUATE CHANNEL, PIPE OR PIPE SYSTEM, OR TO A DETENTION FACILITY.

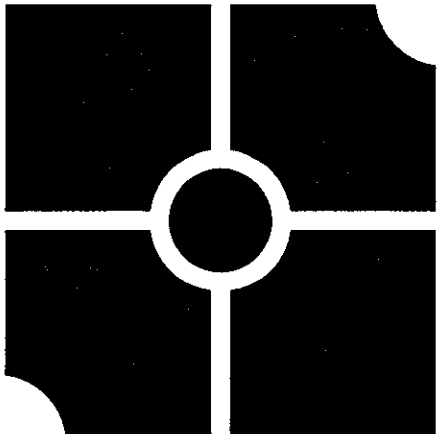
MS-28 IN APPLYING THESE STORMWATER MANAGEMENT CRITERIA, INDIVIDUAL LOTS OR PARCELS IN A RESIDENTIAL, COMMERCIAL OR INDUSTRIAL DEVELOPMENT SHALL NOT BE CONSIDERED TO BE SEPARATE DEVELOPMENT PROJECTS. INSTEAD, THE DEVELOPMENT, AS A WHOLE, SHALL BE CONSIDERED TO BE A SINGLE DEVELOPMENT PROJECT. HYDROLOGIC PARAMETERS THAT REFLECT THE ULTIMATE DEVELOPMENT CONDITION SHALL BE USED IN ALL ENGINEERING CALCULATIONS.

MS-29 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.

MS-30 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 THE 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 § 82.1-44.15:54 OR 82.1-44.15:65 OF THE ACT.

MS-31 FOR PLANS APPROVED ON AND AFTER JULY 1, 2014, THE FLOW RATE CAPACITY AND VELOCITY REQUIREMENTS OF § 82.1-44.15:52 A OF THE ACT AND THIS SUBSECTION SHALL BE SATISFIED BY COMPLIANCE WITH WATER QUANTITY REQUIREMENTS IN THE STORMWATER MANAGEMENT ACT (§ 82.1-44.15:24 ET 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 (VSMP) REGULATION OR ARE EXEMPT PURSUANT TO SUBDIVISION C 7 OF § 82.1-44.15:34 OF THE ACT.

COMPLIANCE WITH THE WATER QUANTITY MINIMUM STANDARDS SET OUT IN 9VAC25-870-66 OF THE VIRGINIA STORMWATER MANAGEMENT PROGRAM (VSMP) REGULATION SHALL BE DEEMED TO SATISFY THE REQUIREMENTS OF THIS SUBSECTION. **ALL DOWNSTREAM FEATURES SHALL BE PROTECTED FROM SEDIMENT DEPOSITION. THIS PROJECT DOES NOT CALL FOR AN INCREASE IN IMPERVIOUS AREA, THEREFORE, ALL DOWNSTREAM FEATURES WILL NOT BE IMPACTED FROM AN INCREASE IN VELOCITY OF FLOW RATE.**



parker
DESIGN GROUP
ENGINEERS • SURVEYORS • PLANNERS • LANDSCAPE ARCHITECTS

2122 Carolina Ave. SW 1915-B.W. Cary Street
Roanoke, VA 24014 Richmond, VA 23220
Ph: 804-387-1153 Phone: 804-358-1947
Fax: 540-389-5767 Fax: 804-359-9645

www.parkerdgi.com

These documents are the property of Parker Design Group (PDG) and may not be reproduced or used without the express permission of PDG. Any reuse of these documents without authorization of PDG will be at the sole risk of the individual or entity utilizing said documents.



**Koppers Waterline Extension
for Koppers Industries, Inc.**
4020 Koppers Road
Catawba Magisterial District
Roanoke County, Virginia

REVISIONS:

DESIGNED BY: JPA

DRAWN BY: JPA

CHECKED BY: SLR

SCALE: N/A

DATE: 07 April 2017

SHEET TITLE:

**EROSION &
SEDIMENT CONTROL
NARRATIVE**

C08
08 OF 09
PROJECT NUMBER:
16-0151-03