

This document, together with the conditions and design presented herein, is an integral part of the contract and shall be read in conjunction with the specifications and drawings. It is the responsibility of the Engineer to ensure that the design is in accordance with the specifications and drawings. The Engineer shall be responsible for the design and shall be liable for any errors or omissions. The Engineer shall not be responsible for any errors or omissions in the design or for any damage or loss resulting therefrom. The Engineer shall not be responsible for any errors or omissions in the design or for any damage or loss resulting therefrom. The Engineer shall not be responsible for any errors or omissions in the design or for any damage or loss resulting therefrom.

9VAC25-830, Minimum standards.
A VESCP must be consistent with the following criteria, techniques and methods:

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. Topsoil may be used as permanent stabilization per the VESCH and must be compacted to a minimum depth of 2 to 4 inches. Contractor to adhere to these standards while developing this site.

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. Contractor to temporarily seed stockpile if stockpile is not used within (14) FOURTEEN days

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. Contractor to adhere to this standard for developing this site.

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. Contractor to install temporary sediment barriers for the initial E&S installation. After site has stabilized and development is nearly finished, Contractor to obtain approval from Botetourt County site inspector to fill and stabilize traps.

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

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.

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 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.

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.

All cut and fill sites for this site will be at 3:1 min. or flatter

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. There will be no concentrated runoff flowing down cut or fill slope.

9. Whenever water seeps from a slope face, adequate drainage or other protection shall be provided. Contractor to adhere to this criteria for development of this site

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. Contractor to adhere to this criteria for development of this site.

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.

All inlets and outlets culverts shall have either inlet or outlet protection. Channels slopes are such that no protection is needed (i.e. jute mesh, geogrid, etc.)

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 for this site

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 for this site

14. All applicable federal, state and local chapters pertaining to working in or crossing live watercourses shall be met. Not Applicable for this site

15. The bed and banks of a watercourse shall be stabilized immediately after work in the watercourse is completed. Not Applicable for this site

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. Restoration shall be accomplished in accordance with this chapter.

f. Applicable safety chapters shall be complied with. Contractor to adhere to this criteria for development of this site.

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. Contractor to adhere to this criteria for development of this site. A construction entrance will be implemented for this site. Any mud/dirt/debris from construction site onto Town Center Street shall be immediately cleaned.

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 VESCP 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 to adhere to this criteria for development by permanent seeding.

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:

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.

(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.

(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 channels to a condition where a ten-year storm will not overtop the banks and a two-year storm will not cause erosion to channel the bed or banks; or

(2) Improve the pipe or pipe system to a condition where the ten-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 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 VESCP authority to prevent downstream erosion.

d. The applicant shall provide evidence of permission to make the improvements. (VDOT Approval)

e. All hydrologic analyses shall be based on the existing watershed characteristics and the ultimate development condition of the subject project.

f. 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.

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 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. This site was designed to comply with the above criteria.

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. This site was designed to comply with the above criteria by calling for inlet/outlet protection, diversion berms, silt fence.

l. 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 § 10.1-562 or 10.1-570 of the Act.

The project meets MS-19.

m. For plans approved on and after July 1, 2014, the flow rate capacity and velocity requirements of § 10.1-561 A of the Act and this subsection shall be satisfied by compliance with water quantity requirements in the Stormwater Management Act (§ 10.1-603.2 et seq. of the Code of Virginia) and attendant regulations, unless such land-disturbing activities are in accordance with 4VAC50-60-48 of the Virginia Stormwater Management Program (VSMP) Permit Regulations.

n. Compliance with the water quantity minimum standards set out in 4VAC50-60-66 of the Virginia Stormwater Management Program (VSMP) Permit Regulations shall be deemed to satisfy the requirements of Minimum Standard 19. This project adheres and satisfies the minimum standards

EROSION AND SEDIMENT CONTROL NARRATIVE

Dairy Queen at Daleville Town Center

PROJECT DESCRIPTION

This project consists of a new 2,663SF single-story building with drive-through for a new fast food restaurant. This site will be located in an out-parcel of Daleville Town Center and will consist of two shared entrances from Town Center Street and will have 42 paved parking spaces with sidewalks. The total disturbed area for this project is 0.85 acres. The site drains to an existing stormwater management area designed and approved during the development of the Daleville Town Center that has been sized to compensate for this development.

EXISTING SITE CONDITIONS

The existing site consists of a parcel that was previously graded as part of the Daleville Town Center mass grading project. It has a general north to south drainage pattern.

ADJACENT AREAS

The parcel for this site is bounded by Roanoke Road (U.S. Route 220) to the east and Town Center Street to the west. The site is bordered by a restaurant (Rodeo Chico) to the north and the Bank of Botetourt to the south.

OFFSITE AREAS

No off site areas are planned for the construction of this project.

SOILS

Source of soils information is SSURGO Database (USDA) and NWI GIS Data (Chart Tiff).

Map unit: 28C--Grosedose silt loam, 7 to 15 percent slopes

Map Unit Setting

Elevation: 1,000 to 2,600 feet

Mean annual precipitation: 30 to 45 inches

Mean annual air temperature: 50 to 57 degrees F

Frost-free period: 153 to 196 days

Map Unit Composition

Grosedose and similar soils: 80 percent

Description of Grosedose

Setting

Landform: Hills

Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Side slope, nose slope, interfluv

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Residuum weathered from limestone and shale

Typical profile

H1 - 0 to 16 inches: silt loam

H2 - 18 to 65 inches: clay

H3 - 65 to 165 inches: silty clay loam

Properties and qualities

Slope: 7 to 15 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Moderate (about 6.5 inches)

Interpretive groups

Familand classification: Familand of statewide importance

Land capability classification (rigitated): None specified

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: C

CRITICAL AREAS

Critical erosion areas are areas where slopes are 2:1 or steeper and areas of proposed ditches. No critical areas exist within the bounds of this development.

EROSION AND SEDIMENT CONTROL MEASURES

Unless otherwise indicated, all vegetative and structural erosion and sediment control practices shall be constructed and maintained according to minimum standards and specifications of the 1992 Virginia Erosion and Sediment Control Handbook, or latest edition. The minimum standards of the Virginia Erosion and Sediment Control Regulations shall be adhered to unless otherwise waived or approved by a variance. The following order of erosion control practices shall be adhered to in preparing this site for construction:

1. Install the construction entrance per the plans.
2. Install silt fence.
3. Install inlet protection on existing inlets.
4. Perform the grading operations.
5. Prepare site and apply temporary seeding.
6. Install storm drain system and inlet protection.

STRUCTURAL PRACTICES

1. CE - TEMPORARY STONE CONSTRUCTION ENTRANCE - 3.02

A stabilized stone pad with a filter fabric under liner located at points of vehicular ingress and egress on a construction site. This pad reduces the amount of mud transported onto paved public roads by motor vehicles or runoff.

2. SF - SILT FENCE BARRIER - 3.05

Silt fence barriers will be installed down slope of areas with minimal grade to filter sediment laden runoff from sheet flow.

3. IP - STORM DRAIN INLET PROTECTION - 3.07

A sediment filter or an excavated impounded area around a storm drain drop inlet or curb inlet. This filter prevents sediment from entering storm drainage systems prior to permanent stabilization of the disturbed area.

VEGETATIVE PRACTICES

1. TS - TEMPORARY SEEDING - 3.31

All denuded areas, which will be left dormant for more than 7 days, shall be seeded with fast germinating temporary vegetation immediately following grading.

2. PS - PERMANENT SEEDING - 3.32

All final-graded areas where permanent cover is desired or rough-graded areas that will not be brought to final grade for a year or more shall be seeded with perennial vegetation within 7 days of reaching final grade.

3. MU - MULCHING - 3.35

Application of plant residues or other suitable materials to the soil surface to prevent erosion by protecting the soil surface from raindrop impact and reducing the velocity of overland flow. Mulching also fosters the growth of vegetation by increasing available moisture and providing insulation against extreme heat and cold.

PERMANENT STABILIZATION

All areas disturbed by construction shall be stabilized with permanent seeding within 7 days of reaching final grades. Seeding shall be done with Kentucky 31 Tall Fescue according to Std. and Spec. 3.32, PERMANENT SEEDING, of the 1992 Virginia Erosion and Sediment Control Handbook, latest edition. Mulch (straw or fiber) will be used on all seeded areas. In all seeding operations, seed, fertilizer and lime will be applied prior to mulching. Erosion control blankets may be installed over fill slopes which have been brought to final grade and have been seeded to protect the slopes properly.

MAINTENANCE

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

1. The sediment trapping devices such as silt fence, inlet protection check dams and level spreader will be checked regularly for sediment clean-out levels.
2. The silt fence barriers will be checked regularly for undermining or deterioration of the fabric. Sediment shall be removed when the level of sediment deposition reaches half way to the top of the barrier.
3. The seeded areas will be checked regularly to ensure that a good stand of grass is maintained. Areas shall be fertilized and re-seeded as needed.

STORMWATER RUNOFF

The development of this site and the corresponding runoff was analyzed and compensated for during the design of the existing stormwater management facility to which it drains.

EROSION - SILTATION CONTROL COST ESTIMATE				
ALL COSTS GIVEN ARE COMPLETE IN PLACE				
DESCRIPTION	UNIT	QTY.	UNIT COST	TOTAL COST
3.02 - CONSTRUCTION ENTRANCE	EA	1	\$ 1,500.00	\$ 1,500.00
3.05 - SILT FENCE	LF	205	\$ 5.00	\$ 1,025.00
3.07 - SD INLET PROTECTION	EA	6	\$ 625.00	\$ 3,750.00
3.31 - TEMPORARY SEEDING	SF	5,400	\$ 0.25	\$ 1,350.00
3.32 - PERMANENT SEEDING	SF	5,400	\$ 0.25	\$ 1,350.00
3.35 - MULCHING	SF	5,400	\$ 0.25	\$ 1,350.00
SUB-TOTAL				\$ 10,325.00
10% CONTINGENCY				\$ 1,032.50
TOTAL PROJECT COST				\$ 11,357.50
TOTAL DISTURBED AREA		37,026 SF	0.85 AC	
AVERAGE EROSION CONTROL PER ACRE:		\$13,362		



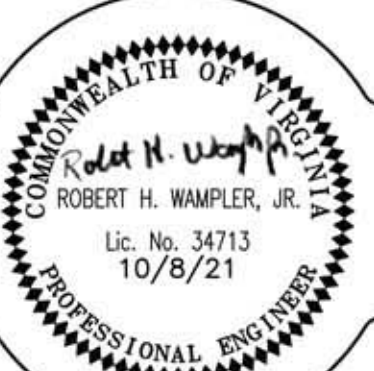
**ENGINEERING
CONCEPTS, INC.**

94 GREENFIELD STREET
DALEVILLE, VIRGINIA 24063
540.473.1263

No.	Description	Date											

**DAIRY QUEEN
DALEVILLE TOWN CENTER**

**E&S NOTES
AND SUMMARY**



0 1 2
GRAPHIC SCALE

PROJECT: 21055

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